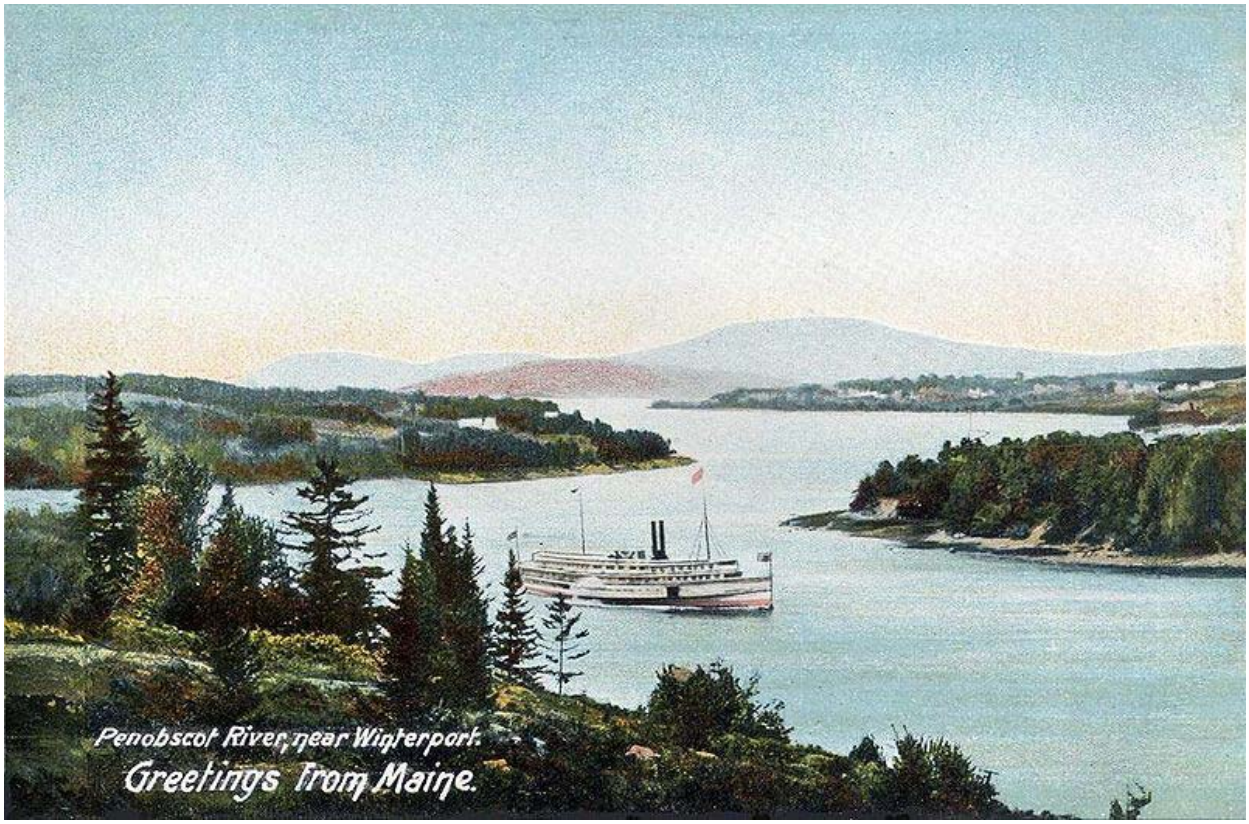
Multi-Modal Corridor Management Plan for the Penobscot River Corridor



Prepared by the Hancock County Planning Commission and
Eastern Maine Development Corporation
for the
Maine Department of Transportation
June 2011

Table of Contents

1.0 INTRODUCTION 3
1.1 Overview of Corridor 3
1.2 Purpose and Needs Statement 4
1.3 Public Participation 4
2.0 EXISTING CONDITIONS 5
2.1 Transportation 5
2.1.1 Highways 5
2.1.2 Rail 14
2.1.3 Marine Transportation 17
2.1.4 Ferries 22
2.1.5 Air Transportation 23
2.1.6 Bicycle and Pedestrian Facilities 25
2.1.7 Pipelines and Other Utility Rights-Of-Way 27
2.1.8 Public Transportation 27
2.1.9 Transportation Objectives 28
2.2 Land Use 29
2.2.1 Comprehensive Plans and Ordinances 30
2.2.2 Land Use Objectives 32
2.3 Review of Existing Plans 32
2.4 Corridor Needs and Deficiencies 33
2.4.1 Western Penobscot Corridor 33
2.4.2 Eastern Penobscot Corridor 34
3.0 RECOMMENDATIONS AND INVESTMENT STRATEGIES 36
3.1 Both Eastern and Western Corridors 36
3.2 Western Penobscot Corridor 37
3.3 Eastern Penobscot Corridor 39

Table of Figures

Figure 1. Roadway Federal Functional Classification 6
Figure 2. Highway Safety Map 8
Figure 3. Traffic Volumes 9
Figure 4. Level of Service 10
Figure 5. Posted Speed Limit 11
Figure 6. Mobility Corridors 13
Figure 7. Pan Am Rail Network 14
Figure 8. Rail Network 16
Figure 9. Marine Facilities 19
Figure 10. Air Facilities 23
Figure 11. Population Change: 2000 - 2010 29
Figure 12. Land Use 31

1.0 INTRODUCTION

This plan is a key regional link to the Maine Department of Transportation (MaineDOT) long-range transportation plan, *Connecting Maine*. *Connecting Maine* identifies statewide and regional issues and opportunities through the year 2030 and establishes goals and performance-based strategies to reach those goals. It also identifies the funding shortfalls that must be addressed to keep Maine competitive and to meet the socio-economic and environmental needs of those who live, work, and play in Maine.

This corridor plan will document corridor assets and deficiencies and establish priorities for transportation, land use, and economic development objectives consistent with *Connecting Maine*. Multi-Modal Corridor Management Plans (MMCMP) will be completed for Maine's 38 Statewide Corridors of Regional and Economic Significance for Transportation (CREST). The Penobscot River MMCMP was developed by two Penobscot River Corridor Committees with support from Eastern Maine Development Corporation (EMDC) and the Hancock County Planning Commission (HCPC).

1.1 Overview of Corridor

The Penobscot River corridor extends from Searsport to Bangor on the west side of the river, and from Verona Island to Brewer on the east side. The corridor includes several highways, the Penobscot River, the Bangor International Airport (BGR), two rail lines, and commercial port facilities at Searsport, Bucksport, and Brewer. The Corridor also includes facilities such as the Maritimes and Northeast pipeline, which crosses the Penobscot River at Orrington. The Penobscot River carries a variety of freight, passenger and recreational vessels. This corridor, though functioning as one system serving the transportation needs of communities and businesses on both sides of the river, has two major components: the west side and the east side. The Penobscot River is the common thread that ties the two sides together.

Western Penobscot Corridor
Highways include US Route 1A in Bangor extending to Stockton Springs, US Route 202 in Bangor extending (and parallel to US Route 1A) to US Route 1A in Hampden, and US Route 1 in Searsport extending to the Penobscot Narrows Bridge between Prospect and Verona. These roads are all two-lane rural highways, except for US Route 202 in Hampden, which is a two-lane limited-access highway and functions as a bypass around Hampden for vehicular traffic.

Eastern Penobscot Corridor
Highway routes include US Route 1 in Searsport extending north across the Penobscot Narrows Bridge to Verona Island and Bucksport, then north along State Route (SR) 15 to Brewer and Bangor. SR 46 intersects with US 1/SR 15 in Bucksport and provides an alternative connection to Route 1A in Holden and on to northern Hancock and Washington Counties. These roads are predominantly two-lane rural highways that accommodate local and regional travel.

The intermodal transportation connections between the existing and proposed port facilities at Searsport, the greater Bangor region, the rail connections between Searsport, Bucksport and

Northern Maine Junction, and the interstate highway system add to the economic importance of the corridor.

1.2 Purpose and Needs Statement

The purpose of this plan is to gather and analyze information that supports transportation and land use decisions that are in the best interests of US Route 1 and SR 15 corridor communities; the people and businesses that depend on the corridor; the region; and the state. This study uses previous studies as its foundation and expands on those efforts by looking to the future needs of the corridor with a prioritized list of action steps and implementation schedules.

This plan seeks to address several critical priorities that were identified by the corridor committee:

- promoting corridor improvements and preservation measures that assure that the corridor remains viable for the efficient movement of freight, tourist and commuting traffic;
- undertaking measures that address the needs of area businesses both in terms of promoting fast and efficient movement of freight and employee/customer traffic;
- encouraging future development policies that preserve key natural features and the small town/rural character of most of the corridor while promoting economic prosperity;
- promoting measures that remove or minimize major traffic bottlenecks and safety hazards to through traffic in the region's service centers;
- increasing opportunities for multi-town assessment of transportation impacts of large-scale residential, commercial and other forms of development.

1.3 Public Participation

EMDC and HCPC organized two advisory committees, on the west and east sides of the Penobscot River, consisting of community representatives, interested residents, business leaders, regional planners, MaineDOT personnel, and individuals representing each of the transportation modes such as marine, trucking, rail, air, transit, and bike and pedestrian. The committees were tasked with developing a vision, goals, and implementation and investment strategies for the corridor. The committee also provided oversight during the development of this plan.

EMDC held several corridor committee meetings on the west side of the river in 2008 and 2009 while HCPC and EMDC co-hosted meetings on the east side of the river in 2009 and 2010.

2.0 EXISTING CONDITIONS

2.1 Transportation

2.1.1 Highways

Western Penobscot Corridor
The US Route 1A corridor connects the commercial, business (including tourism), and residential activities of the coastal communities east of Belfast, to Bangor, the largest urban center in Eastern and Northern Maine. According to MaineDOT, there are no un-built sections of highway. Truck climbing lanes are located at the southern end of US Route 1A in Stockton Springs and in Winterport. The majority of the corridor has paved shoulders, although there are several miles where shoulders are gravel.

The Back Winterport Road has become a de facto bypass for commuters and trucks seeking to avoid congestion along US Route 1A in Hampden. The new Hampden Academy, currently under construction, may relieve some of the school-related congestion on US Route 1A in Hampden by relocating direct access to the new facility via Western Avenue.

Eastern Penobscot Corridor
SR 15 between Bucksport and Bangor is a minor arterial roadway that connects the commercial, business, tourism and residential activities of the coastal communities south and east of Bucksport, to Bangor. SR 15 originates in Stonington, a coastal community with an active fishing harbor on Deer Isle, but is classified as a major collector highway through Orland. The Stonington to Orland segments are not considered in this plan. The majority of SR 15 has paved shoulders one to three feet in width, although there are several miles where shoulders are gravel. According to MaineDOT, there are no un-built sections of SR 15 between Bucksport and Brewer because the corridor has undergone major upgrades over the past 15 years.

SR 46 is a two-lane major collector roadway that extends from US 1/SR15 in Bucksport to SR 9 in Eddington and is heavily used as a commuter and truck route. SR 9 is a major east-west corridor connecting I-95 and the greater Bangor area to the west and Washington County and the Canadian Maritime Provinces to the east. MaineDOT's Six Year Plan identifies 6.33 miles of roadway in Bucksport and Orland in need of rehabilitation or reconstruction.

US Routes 1 and 1A, and SR 15, are all-purpose routes that cater to the access and mobility needs of abutters and longer-distance travelers as well. The routes are not congested, except for short durations at peak times in certain locations, especially where more urban conditions are encountered in Bangor, Brewer, and Hampden.

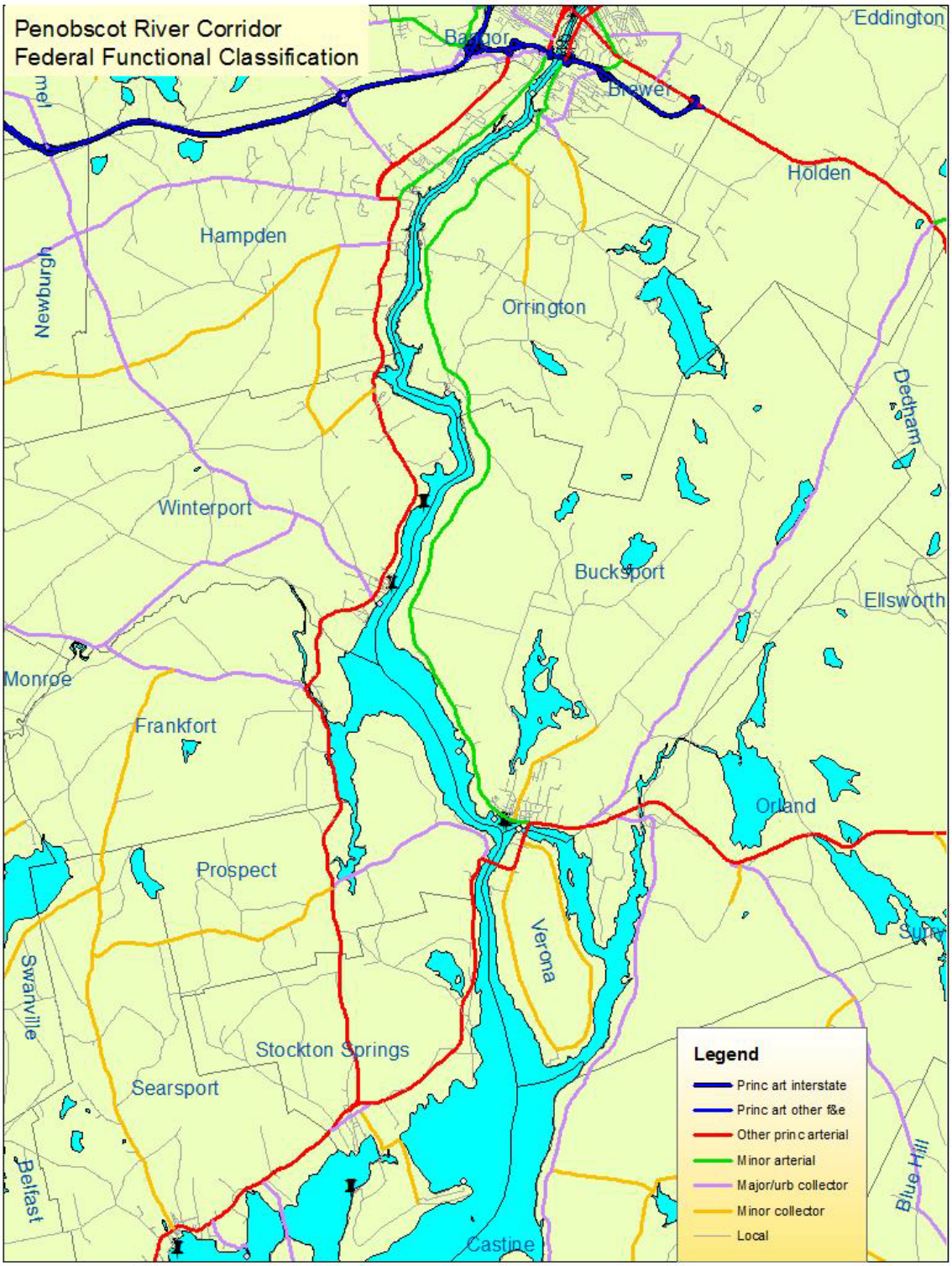


Figure 1. Roadway Federal Functional Classification

Highway Safety

MaineDOT rates accidents according to a Critical Rate Factor (CRF), which corresponds to the number of times the actual accident rate exceeds the expected (average) accident rate. Generally, a CRF of 1.0 or more indicates a higher than usual number of accidents at that specific intersection or stretch of road.

Western Penobscot Corridor

According to the 2006-2008 MaineDOT High Crash Location (HCL) Listing, there are no high-crash locations (nodes nor links) in the corridor south of the Bangor city line (see Figure 2).

Several corridor committee members, however, noted that the intersection of US Route 1A and SR 174 in Prospect is a dangerous intersection with many near misses due to high approach speeds on US Route 1A. MaineDOT recently lowered the posted speed limit to address safety concerns associated with this intersection. However, committee members say traffic rarely slows down to the new 35-mph speed limit; thus the hazardous condition continues.

Crash by Type 1998-2008
Penobscot River Corridor

CRASH TYPE	Count	Percent
Bear	1	0%
Deer	712	8%
Moose	23	0%
All other animals	14	0%
Bike	51	1%
Pedestrians	76	1%
Train	1	0%
Fire	45	1%
Head-on/sideswipe	360	4%
Intersection movement	2,172	25%
Jackknife	9	0%
Object in road	292	3%
Ran off road	1,328	15%
Rear end/sideswipe	3,555	40%
Rollover	29	0%
Other	181	2%
Total	8,849	100%

Source: MaineDOT 1998 - 2008

Eastern Penobscot Corridor

Brewer has no HCLs on Route 15 south of I-395. There is one HCL in Orrington and four in Bucksport. One of those Bucksport HCLs is located at the intersection of Bridge Street and Main Street (Route 15) in downtown Bucksport. This location has the highest CRF at 2.83 in all of Hancock County and is ranked 25th in the State of Maine.

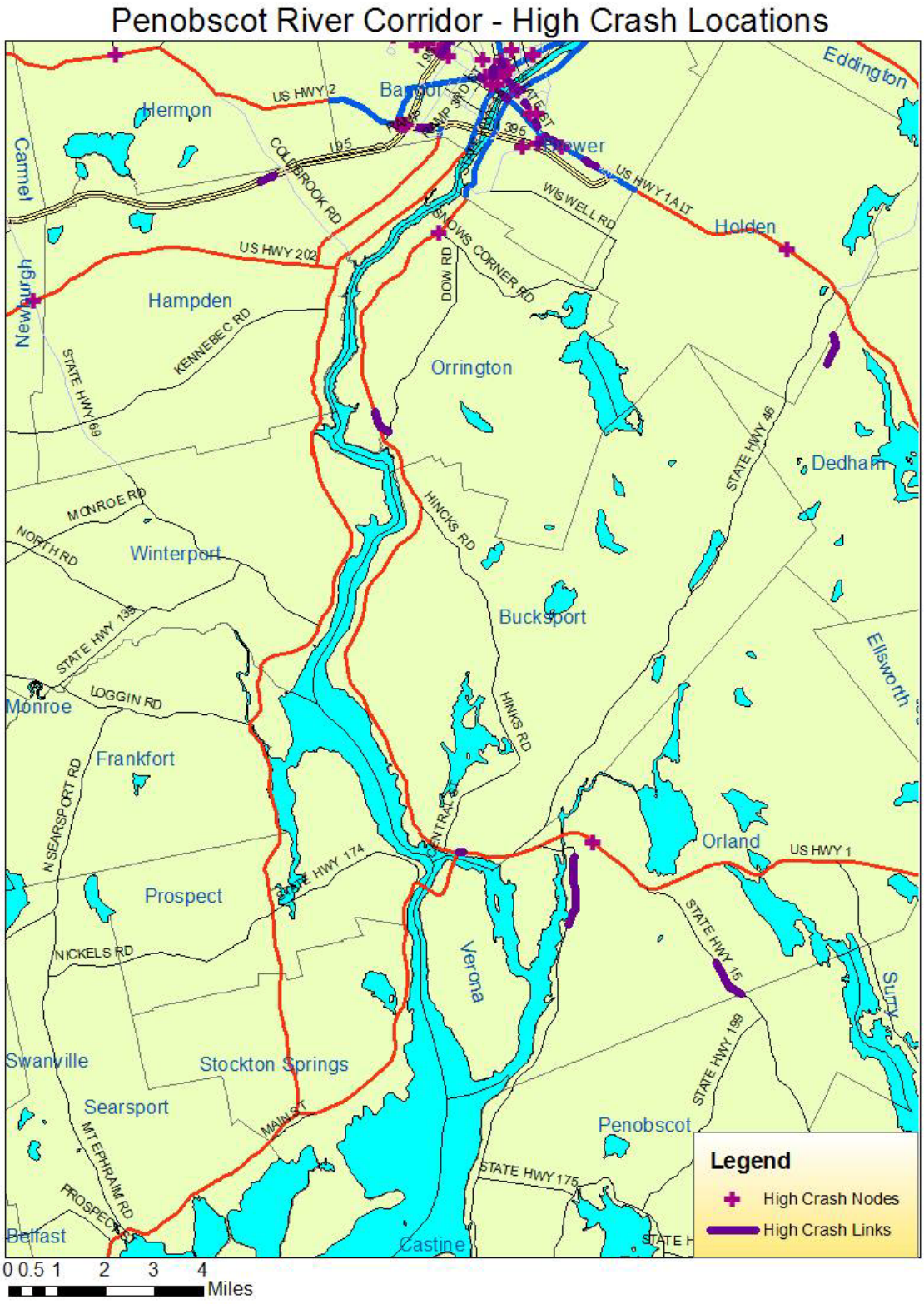


Figure 2. Highway Safety Map

Traffic Volumes

Western Penobscot Corridor

Traffic volumes are at their highest at the north and south ends of the corridor. The lowest volumes are experienced in the southern section of US Route 1A just north of its intersection with US Route 1. Figure 3 indicates that the Factored Annual Average Daily Traffic (FAADT) ranges from a high of 14,730 in Bangor to a low of 3,206 in Prospect. FAADT decreased between 2002 and 2006 in much of the corridor ranging from -3.2 percent in Bangor to -20.8 percent in Prospect. Traffic volumes increased, however, 2.2 percent in Winterport and 22.0 percent in Hampden during the same period.

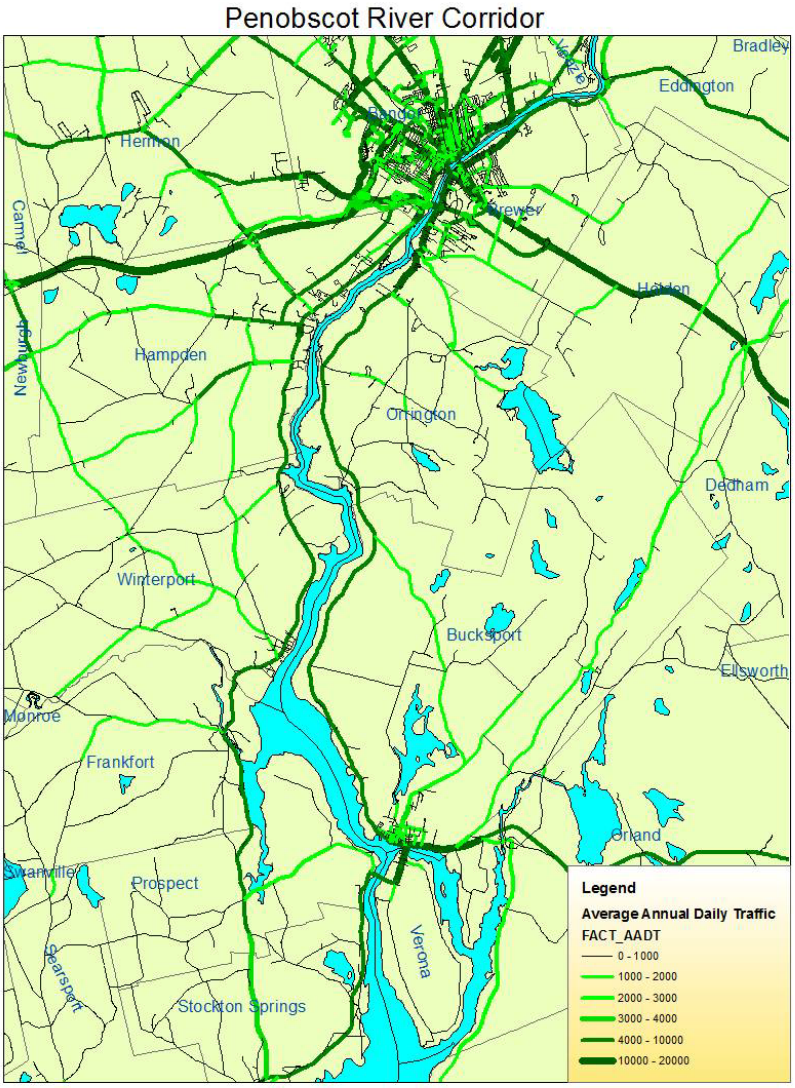


Figure 3. Traffic Volumes

Eastern Penobscot Corridor

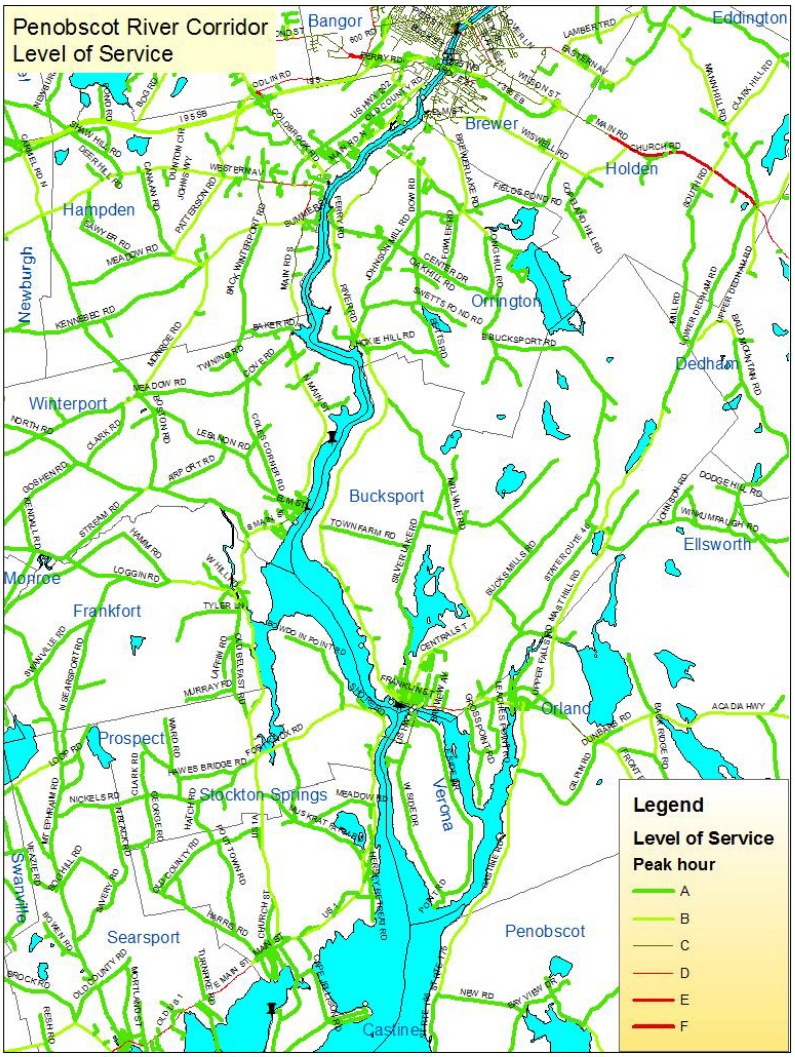
Traffic volumes on the east side of the river follow similar patterns as on the west, with higher volumes at the northern and southern ends of the corridor. The lowest volumes have been recorded in the central portion of the corridor in north Bucksport and Orrington.

Figure 3 indicates that the 2008 Factored Annual Average Daily Traffic (FAADT) ranges from a high of 8,640 in Brewer to a low of 3,2520 in north Bucksport near the Town Farm Road. FAADT has decreased between 2003 and 2007 at three of the four traffic count locations, ranging from -7.9 percent to -8.5 percent. Traffic volumes increased 9.6 percent in downtown Bucksport during the same period, however.

Level of Service

Traffic congestion can lower a roadway's level of service (LOS). There are six levels of service, given letter designations from A to F. LOS A represents the best "free flow" operating conditions, while LOS F represents the worst, breakdown flow. LOS E is defined as the maximum flow or capacity of a system. For most purposes, however, a level of C or D is usually used as the maximum acceptable volume. As an annual average, however, LOS does not reveal the increased congestion during the tourist season. Therefore, for planning purposes, a seasonally adjusted LOS should be used when analyzing the need for local traffic management improvements.

The majority of the corridor is operating at an LOS of B and C. Localized congestion during peak times on US Route 1 in Searsport and Route 15 Main Street) in Brewer contribute to a lower LOS of D.



The Highway Capacity Manual and AASHTO Geometric Design of Highways and Streets ("Green Book") list the following levels of service:
A= Free flow
B=Reasonably free flow
C=Stable flow
D=Approaching unstable flow
E=Unstable flow
F=Forced or breakdown flow

Figure 4. Level of Service

Posted Speed Limit

The Posted Speed Limit map, below, indicates the posted state speed limit throughout the corridor. Speed limits on US Routes 1 and 1A and State Routes 15 and 1A vary from 25 mph in village areas to 50 mph in the more rural portions of the corridor.

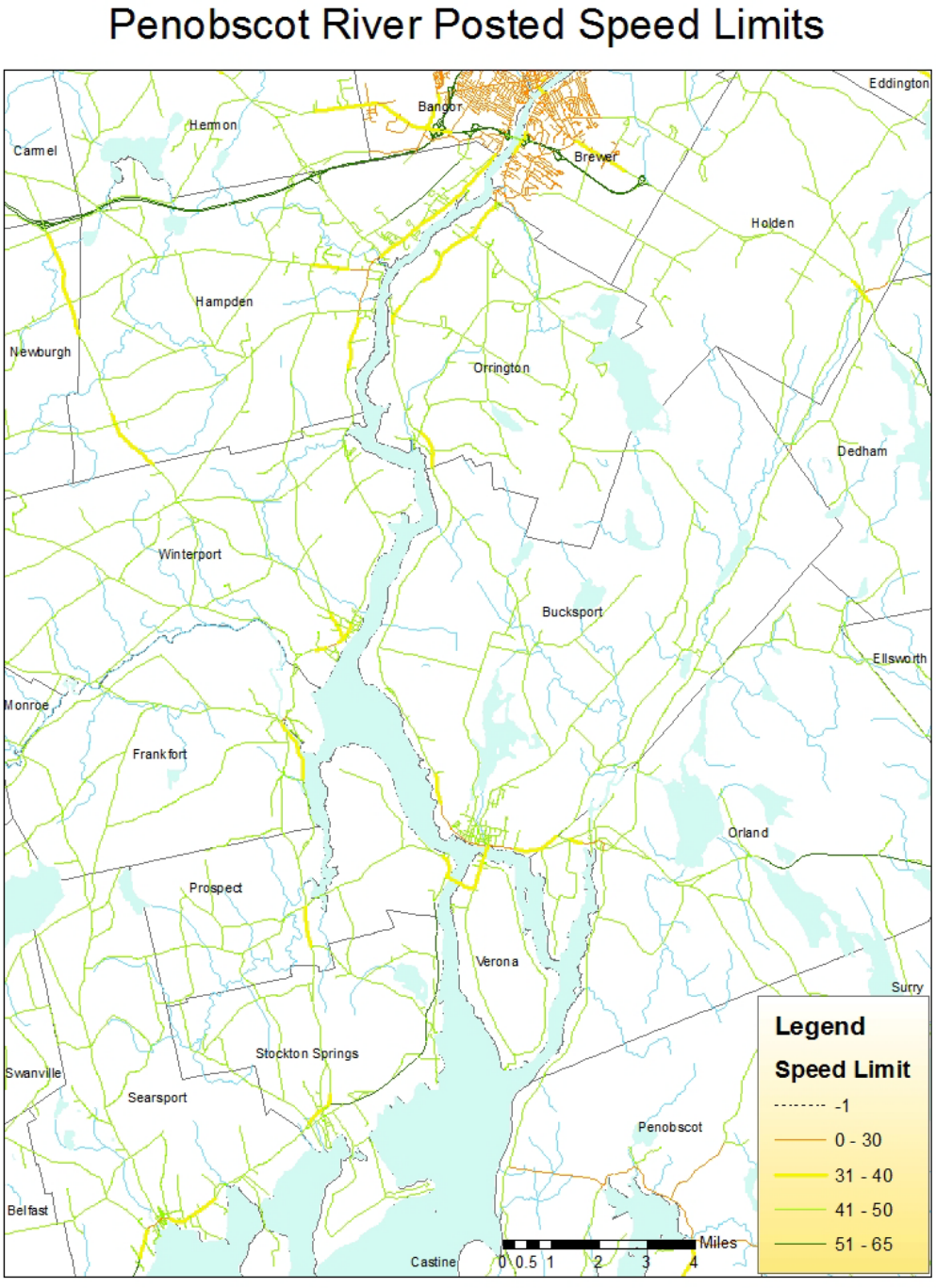


Figure 5. Posted Speed Limit

Access Management and Mobility

Access Management is the planned location and design of driveways and entrances to public roads to help reduce accidents and prolong the useful life of an arterial. While arterial highways represent only 12% of the state-maintained highway system, they carry 62% of the statewide traffic volume. The purpose of access management is to preserve, to the extent possible, the existing traffic-carrying capacity of Maine's arterial highways. At a minimum, access management should defer costly highway reconstruction due to the proliferation of driveways and curb cuts associated with unmanaged development along Maine's arterials.

MaineDOT has established standards, including greater sight distance requirements for the permitting of driveways and entrances for three categories of roadways: mobility corridors, retrograde arterials, and all other state and state-aid roads. Mobility arterial corridors are defined as those corridors that connect service centers to service centers or an Urban Compact Area (UCA) to another UCA, have a posted speed limit of 40 mph or higher, and carry at least 5,000 vehicles per day for 50 percent of their length. Retrograde arterials are mobility arterial corridors where the access-related crash per mile rate exceeds the 1999 statewide average for arterial highways with the same posted speed limit.

The major arterials in the corridor, US Routes 1 and 1A and State Route 15, are classified as mobility corridors. US Route 1 in Searsport and Stockton Springs and US Route 1A in portions of Stockton Springs, Prospect, Winterport, and Hampden, are classified as retrograde, while Route 1 from Bucksport through Verona Island to Prospect is classified as a retrograde arterial. Several highway improvements and construction of the new Penobscot Narrows Bridge have significantly changed traffic flow through Verona Island and Prospect, but difficulties remain at the intersection of Route 1 and Route 15 in Bucksport.

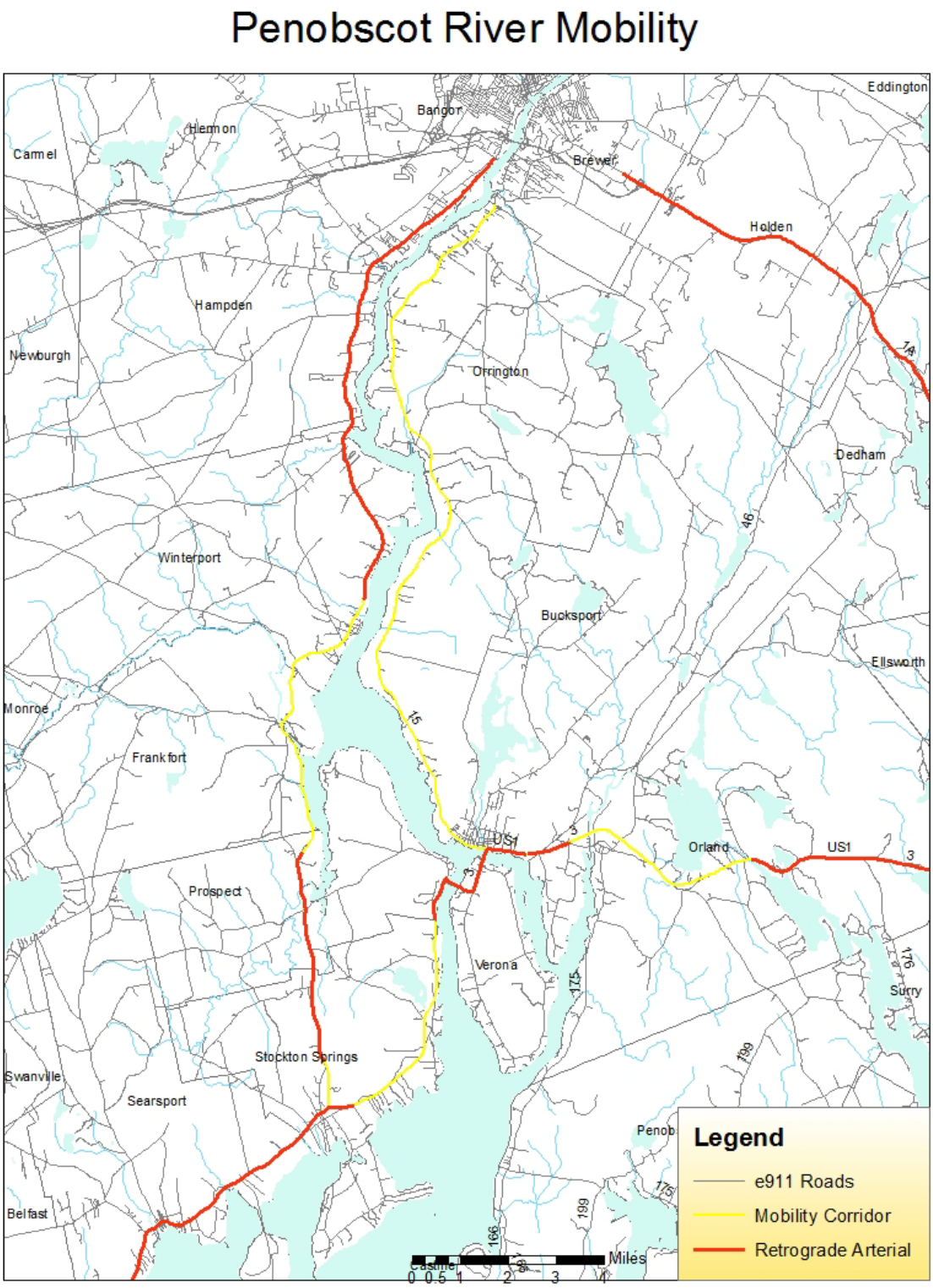


Figure 6. Mobility Corridors

Heavy Haul Truck Network

The MaineDOT commissioned a study to identify a statewide network of highways suitable for commercial truck traffic. The study, entitled "A Heavy Haul Truck Network for the State of Maine," was conducted by Wilbur Smith Associates (2001). The study also identified deficiencies on those highways proposed to be part of the Heavy Haul Truck Network (HHTN) and recommended reconstruction projects and associated costs to address those deficiencies.

Western Penobscot Corridor
Roadways designated as HHTN on the western side of the river include US Routes 1, 1A, 2, and 202; SR 9 and 15; the Coldbrook Road; and Interstates 95 and 395.

Eastern Penobscot Corridor
MaineDOT designated SR 15 from Bucksport to Brewer and US Route 1/SR 3 from Bucksport to Searsport as part of HHTN.

2.1.2 Rail

The paper industry is the principal customer of the railroads in Maine, followed by other forest products industries. According to the Association of American Railroads (AAR), pulp and paper products are the top commodities originating in Maine and transported by rail, followed by wood products, petroleum, chemicals, waste and scrap, and other. Total tonnage of goods hauled by Maine's railroads continues to decline, as is the case nationally. Two rail systems, Montreal, Maine & Atlantic and Pan Am Railways, which provide freight rail connections to Canada and the remainder of the United States, serve the Penobscot River Corridor area. The Calais Branch connecting Brewer and Ellsworth is not in operation other than a short excursion train tour operating out of Ellsworth.

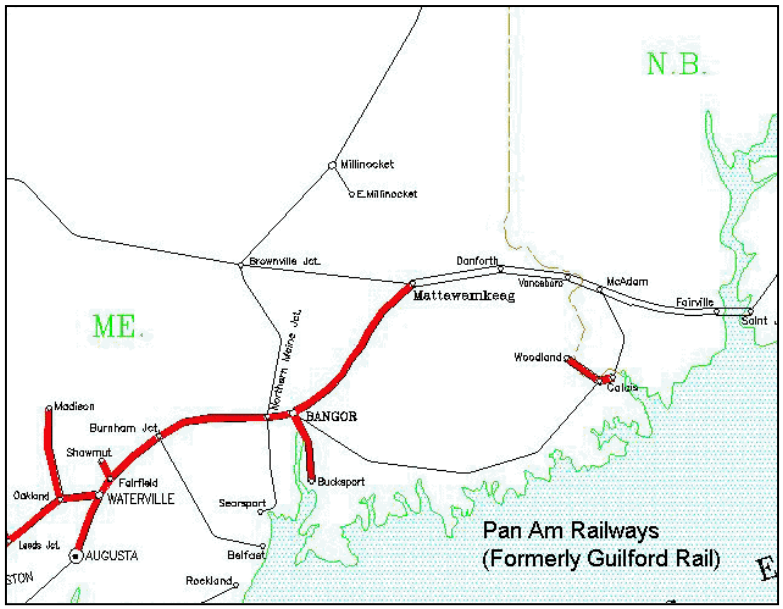


Figure 7. Pan Am Rail Network

Western Penobscot Corridor
The western Penobscot Corridor is served by a rail line owned and operated by the Montreal, Maine, and Atlantic Railroad (MMA), which connects the port at Searsport (Mack Point) to Northern Maine Junction in Hermon. The rail line is a single track, Class 11 railway, which can

operate at 25 mph with a running time of 1.5 to 2 hours between Searsport and Hermon. The right-of-way is 100 feet wide for the majority of its length in the corridor.

Roadway bridge heights along the rail line are high enough to permit double stacking of shipping containers on the MMA railroad from Searsport, through Northern Maine Junction, and on to Montreal and western U.S. and Canadian markets. This rail corridor is the only rail connection with a Maine port that has double-stack capacity.

The rail line has no clearance restrictions as the clear zone is 16 feet wide throughout the corridor. However, if the warning signals and signs at highway grade crossing were moved back, the unobstructed width would be increased substantially.

Currently, there is one train per day in the corridor. Although the rail line itself could handle more freight movements, rail traffic is metered by the rate at which warehousing and oil tanks can handle the commodities.

Eastern Penobscot Corridor

The largest regional railroad in Maine is Pan Am Railways (formerly Guilford Industries), which owns three railroad companies operating in Maine: the Boston and Maine Corporation; the Maine Central Railroad Company; and the Springfield Terminal Railway Company, which operates the rights-of-way of the other two companies.

The Maine Central and the Springfield Central lines (Pan Am) extend from Portland, through Waterville, through Northern Maine Junction in Hermon, then through the BACTS area (along the Penobscot River in Bangor, Orono, and Old Town), Lincoln, and Mattawamkeag. Springfield Central serves the James River paper mill in Old Town.

The line crosses the Penobscot River from Bangor into Brewer where a branch line extends down to the Verso paper mill in Bucksport. Typical products hauled by Pan Am for the paper mills include finished paper rolls, clay, tapioca, chlorine, and other chemicals. The 17.5-mile Brewer-Bucksport rail corridor has seven level-grade crossings over Route 15, in addition to level-grade crossings on several local roads. Travel speed along this corridor is thus restricted. While it is only used to carry freight, this rail corridor skirts the eastern bank of the Penobscot River and features numerous scenic views. Much of the land between the tracks and the river remains undeveloped.

The Calais Branch, an inactive rail line extending from Brewer to Calais, was acquired by the State of Maine in the 1990s. MaineDOT has divided the rail corridor into three sections with the following use:

- a section between Brewer and Washington Junction in Ellsworth leased to Downeast Heritage Rail for excursion operations;
- a rail-banked section between Washington Junction and Ayers Junction in Pembroke currently without tracks or ties, but maintained as the multiuse Sunrise trail; and
- a disused section between Ayers Junction and Calais.

Pan Am Railways, the original owner of the Calais Branch prior to its abandonment in 1985, has retained a 100-foot section of the rail corridor in Brewer.

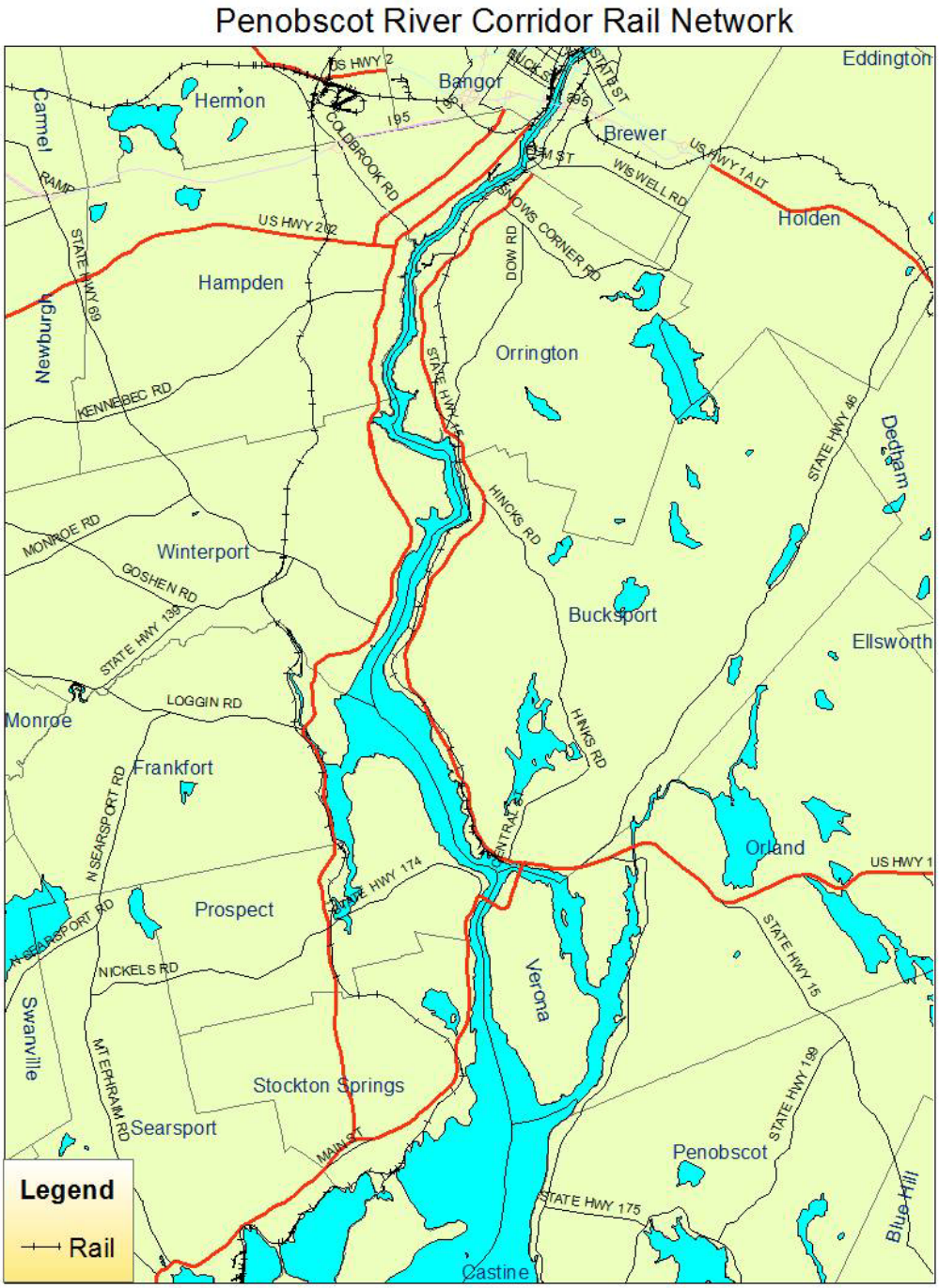


Figure 8. Rail Network

2.1.3 Marine Transportation

Historically, the Penobscot River played a key role in shaping the development of central and eastern Maine. Beginning in the late 1700s, the river served as a freight and passenger transportation corridor to the region. The river was used to power sawmills and to float and boom logs in the 1800s for the lumber and ship-building industries. The river was later used to generate power and support pulp and paper mills as well as other industries. Settlement patterns of the corridor communities along the Penobscot reflect the importance of the river to their respective historical economies. The importance of the river as a transportation corridor has declined significantly over the last century.

Passenger Transportation

Passenger transportation is primarily comprised of private recreational craft. Bangor, Brewer, Searsport, Hampden and Bucksport have active waterfronts with owner-operated motor boats, local tour boats, and an American Cruise Lines (www.americancruiselines.com) inter-coastal scenic cruise ship.

Freight Transportation

There is minimal commercial marine transportation north of Bucksport other than occasional asphalt and petroleum barge shipments. New manufacturing opportunities have arisen in Brewer that may increase demand for water transportation on the Penobscot River.

Petroleum. In recent decades, petroleum fuel has been delivered by tanker ships and barges on the Penobscot River to tank farms at Searsport, Brewer, Hampden, and Bangor. Today, most of the fuel shipped to Hampden and Bangor tank farms is delivered via pipeline originating in Portland, while Searsport and Bucksport storage facilities still receive most of their fuel by ship or barge. Heating oil and gasoline are distributed to retail and wholesale customers throughout Penobscot, Piscataquis, Hancock and Washington Counties by truck. The growth of natural gas and oil pipelines has competed with the reliance on trucks as the backbone of the fuel distribution system

Operations and Maintenance

The Penobscot River's controlling depth in the marked channel is 13 feet between Winterport and Bangor. Buoys, day-beacons, and a lighted buoy to a point about 1.5 miles downstream of Brewer mark the channel. The head of navigation for commercial vessels is immediately downstream of the Joshua Chamberlain Bridge, while smaller recreational vessels can travel to a point about one mile upstream of the Penobscot Bridge. Ice impedes but usually does not prevent navigation above Winterport for nearly 5 months of the year, beginning around December. The river is kept free of ice to a point just upstream of the I-395 Veterans Remembrance Bridge by a Coast Guard icebreaker. However, the Coast Guard has suggested that future ice-breaking operations may be limited, or may cease altogether due to declining commercial marine traffic upstream of the Bucksport area.

Pilotage is required in both the Penobscot Bay and Penobscot River for foreign vessels and U.S. vessels under register in the foreign trade, with a draft of nine feet or more. Large vessels bound for upriver usually take a tug to assist in making the turns and in docking. Five tugs are available in Belfast for such assistance.

The City of Bangor has asked the Army Corps of Engineers (ACOE) to conduct either maintenance or improvement dredging in the Penobscot River from Bucksport to the Joshua Chamberlain Bridge between Brewer and Bangor. The river, last dredged in 1985, has an authorized channel depth of 22 feet from Bucksport to Winterport, 15 feet from Hampden to Brewer, and 14 feet at Bangor. However, numerous areas in the channel have shoaled over the years to depths shallower than the authorized depth. The Bucksport-Winterport channel is now only 18 feet in depth and the Bangor channel is only 11 feet in depth. Bangor has commissioned a feasibility study that compares the benefits of performing maintenance dredging (returning the river channel to authorized depths) to improvement dredging (deepening the river channel to depths greater than the authorized depth). The feasibility study has determined that there is no overwhelming need for improvement dredging and that maintenance dredging will accommodate the type and frequency of future marine traffic expected on the Penobscot River.

Existing Marine Facilities (listed from south to north)

The Port at Mack Point, Searsport. There are two marine terminal facilities at the port at Mack Point, Searsport. The Sprague Energy Pier, following its extensive reconstruction completed in 2003, is 615 feet long with a berth of 850 feet and a draft of 37 feet at mean low water. The Maine Port Authority Pier is 800 feet long and 100 feet wide, with a ship berth on both sides. The pier can accommodate vessels with a draft 32 feet at mean low water on the western side of the pier, and 40 feet on the eastern side. The construction of 90,000 square feet of warehouse is currently underway. Much of the cargo shipped by rail from Searsport passes through the corridor, as the Montreal, Maine, and Atlantic (MMA) railroad and Maine Central Railroad (MCR) pass through Bangor and Brewer. Raw logs, once shipped by truck from northern Maine to sawmills in Searsmont, are now shipped via rail to Mack Point. The logs are then transloaded onto trucks for the last 15 miles to the Searsmont sawmill. This transloading from rail to truck has reduced the overall number of trucks as they travel from northern Maine forests to Searsmont for processing.

The majority of the products shipped through the Mack Point port consist of petroleum, road salt, and products used by area paper mills. However, more and more fuel suppliers are concentrating their storage facilities at Mack Point and utilizing trucks to distribute petroleum products to Maine households and businesses. The Sprague Energy terminal handles over 10 million barrels of gasoline and fuel oil annually and supplies most of the heating fuel needs of central and northern Maine.

Sears Island, Searsport. Sears Island is an undeveloped 941-acre island located in Searsport at the northern part of Penobscot Bay. The island is currently owned by the MaineDOT, which, in anticipation of developing a cargo port on the island, constructed a causeway in the 1980s, providing road access between Sears Island and US Route 1 on the mainland.

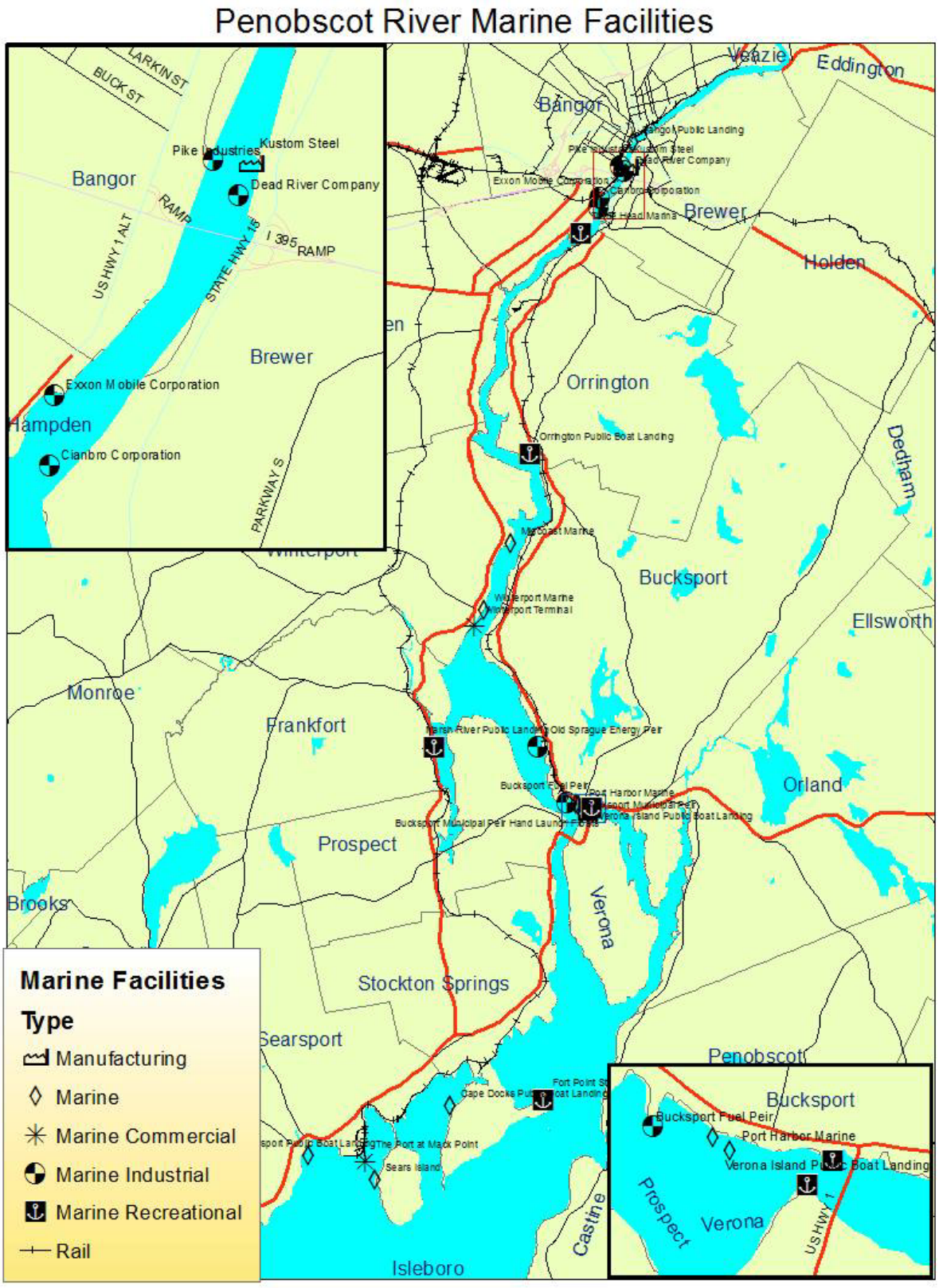


Figure 9. Marine Facilities

The Sears Island Planning Initiative, sponsored by the State of Maine and the town of Searsport, is a planning process that includes Maine state agencies, Searsport, transportation and industrial interests, conservation organizations, and interested citizens. As part of this process, these entities have formed the Joint Use Planning Committee, a group representing a broad range of interests and perspectives, which is charged with planning for the future of Sears Island. In early 2008, the group signed onto a Consensus Agreement whereby 341 acres will be reserved for the development of a cargo port and the remaining 600 acres will be permanently set aside for conservation, education and recreation.

Bucksport Fuel Pier. The Bucksport Fuel Pier is owned and operated by Sprague Energy. Fuel is off-loaded from oceangoing ships and transferred via pipeline to the Webber Energy tank farm located about 0.5 miles north on Route 15. The petroleum is transferred and distributed by truck to commercial and retail customers throughout central and coastal Maine. The pier offers 29 feet of depth at mean low water and a berthing capacity of 700 feet.

Port Harbor Marine. Port Harbor Marine operates a full-service marina located on the Penobscot River in downtown Bucksport. The marina offers fuel, water, sewage pump-out, supplies, and 50 seasonal or transient slips for vessels up to 90 feet in length.

Bucksport Waterfront. The Town of Bucksport maintains a public docking area with pier, floats, and temporary tie-ups. The waterfront is connected by a mile-long scenic walkway.

Verona Island Public Boat Landing. The Verona Island Public Landing is a publicly owned facility that features a boat ramp and parking for vehicles and trailers. The U.S. Coast Guard maintains an equipment building on the premises that supports emergency operations for the Penobscot River and Bay. The boat ramp also serves as an access point for water-related emergencies in the area. The 2006 Verona Island Comprehensive Plan notes, "The boat ramp area does not allow for convenient loading or unloading of boats since there is no dock to temporarily tie up to while an unloaded vehicle is being parked. Other inadequacies of the boat launch area include lack of fuel facilities, lack of protection against strong tides and lack of a sewage pump-out facility."


Winterport Terminals. Winterport Terminals operated a small floating pier located in Winterport on the Penobscot River. The pier has a berth of 550 feet and 24 feet at MLW. The terminal has 340,000 cubic feet of freezer warehouse. Although the facility has direct access to US Route 1A, the MMA rail line is located about two miles away. The facility has not been operation for several years.

Winterport Marine. Winterport Marine is a full-service marina located on the Penobscot River near the Winterport village area. The marina offers fuel, water, sewage pump-out, moorings, boat ramp, and vessel repair, maintenance, and storage. Maximum vessel length accommodated by Winterport Marine's docking system and travel-lift is 80 feet.

Mid-coast Marine. Mid-coast Marine is a full-service marina located on the Penobscot River about two miles north of the Winterport village area. The marina offers fuel, water, sewage pump-out, moorings, boat ramp, and vessel repair, maintenance, and storage.

Orrington Public Boat Landing. The Orrington Public Boat Landing is a publicly owned ramp located off an old section of SR 15 in South Orrington. The facility provides parking for vehicles and boat trailers.

Marsh River Public Landing. Marsh River Public Landing is a publicly owned boat ramp located at the former site of the Waldo Granite Works. The facility provides ample parking for vehicles and boat trailers.

Cape Docks Public Boat Landing. The Cape Docks Public Boat Landing is located in Stockton Springs off the Cape Road. The facility provides access to Stockton Harbor for commercial and recreational vessels and consists of two concrete ramps, finger floats, and parking for vehicles and boat trailers.

Searsport Public Boat Landing. The Searsport Public Boat Landing is located at the end of Steamboat Avenue off US Route 1 in Searsport. The facility serves commercial and recreational vessels and consists of a pier, floats, a paved boat ramp, and parking for vehicles and boat trailers.

Exxon-Mobil Oil Corporation. Exxon-Mobil maintains a privately owned petroleum facility located in Bangor. The facility includes an earth-filled timber crib bulkhead with a gravel deck approximately 30 feet wide and 40 feet long, nine storage tanks, two tanks for storing additives, and a single-story building used as an office and warehouse. The Exxon-Mobil facility receives its gasoline, heating oil, diesel, and kerosene via a pipeline from South Portland and, while maintaining the capability to accommodate barges as a contingency measure, seldom uses its pier for shipping or receiving petroleum products.

Pike Industries. Pike Industries is a privately owned liquid asphalt supply facility that includes one 700-foot pier, seven medium-sized storage tanks, an office, and a boiler building. The storage tanks are used to store liquid asphalt, a petroleum product used in the production of highway asphalt. Pike Industries receives its asphalt products via barge.

Webber Energy Fuels. Webber Energy operates a privately owned petroleum facility, located in Bangor, with a steel-and-concrete dock 30 feet wide by 40 feet long, 11 storage tanks, and an office building. Webber receives the majority of its petroleum products via pipeline originating in South Portland. Fuel is occasionally delivered by barge to the Bangor Webber facility.

Bangor Public Landing. The Bangor Public Landing is a publicly owned facility that includes a dock for recreational vessels and three floating docks with steel ramps, a harbormaster's office, public restrooms, drinking water, and parking. The landing is located in Bangor's riverfront park immediately downstream of the Joshua Chamberlain Bridge.

Cold Brook Energy. Cold Brook Energy is a privately owned petroleum facility located in Hampden that includes a 20' x 30' dock and nine storage tanks. Cold Brook Energy receives its diesel fuel, heating oil, and kerosene via pipeline from South Portland but maintains a docking facility for occasional barge deliveries.

Turtle Head Marina. Turtle Head Marina is a public boat launch facility for recreational boats. It is located off Route 1A in Hampden, near the intersection of the Coldbrook Road and Route 1A. The facility includes a paved boat launch ramp, ten 6' x 10' finger floats, 60 parking spaces, and a picnic area. Fuel, ice, water, take-out food, additional moorings, and marine supplies and repairs are available at an adjacent privately owned marina.

Dead River Company. Dead River operates a privately owned petroleum facility located in Brewer that includes a timber crib dock approximately 30 feet wide by 40 feet long, five storage tanks, and an office building. Dead River receives the majority of its heating oil, diesel fuel, and kerosene via truck originating from their Bucksport terminal facility. Dead River maintains a pier for the occasional barge delivery.

2.1.4 Ferries

There is no public or privately operated ferry service within the corridor. The Maine State Ferry Service provides ferry service to major islands in Penobscot Bay.

2.1.5 Air Transportation

Bangor International Airport (BGR) offers domestic air service to the region and serves as a transit point for commercial and international flights. The airport is also home to the 101st Maine National Guard Air Refueling Wing. BGR is strategically located on the Great Circle Northern Route with easy access to the northeastern United States and eastern Canada via Interstate 95, other major highways, rail service, and a deep-water port. BGR is the closest full-service U.S. airport to Europe with fuel and customs services available 24 hours a day, seven days a week. The airport, known as a world-class transatlantic facility, has all-weather access, CAT III, ILS, an 11,440-foot runway, and is capable of handling any aircraft flying today.

BGR provides refueling, aircraft servicing, passenger and cargo services, and all transit needs for passenger, cargo, military, and corporate flights. Bangor is one of the leading airports for business tech stops in the North Atlantic market.

As the aviation industry is very volatile, BGR will continue to face challenges based upon economic and demographic conditions. While traffic at many airports has decreased, BGR actually experienced an increase in passenger traffic post 9-11, with 388,681 enplanements in 2009. Due to the recent economic downturn, however, BGR passenger traffic levels decreased 11 percent. The airport continues to work to entice airlines to serve Bangor and attempts to maintain a balance between low-cost service to leisure destinations and convenient access to major hubs which provide connectivity worldwide.

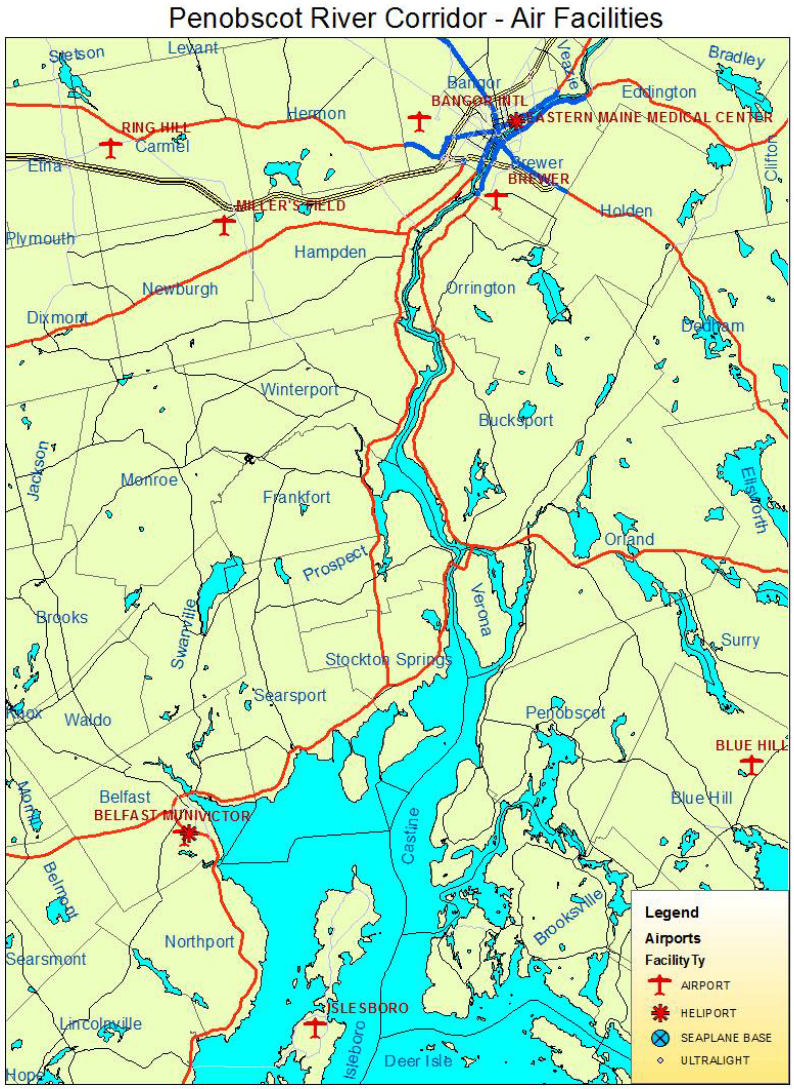


Figure 10. Air Facilities

Recent capital improvements at Bangor International Airport, totaling $17 million, include runway rehabilitation, ramp and apron resurfacing, and construction of a secondary containment facility for fuel trucks. Currently, the domestic arrivals terminal is undergoing a $2.9 million expansion project to enhance passenger amenities and airline operations.

The FAA provides about $8 million annually to Maine for airport improvement purposes. FAA funds are administered by MaineDOT, and are made available on a 95/2.5/2.5 (federal/state/local) percentage matching basis. Since 1969, the State of Maine has approved bond issues every two years to provide the match for FAA funds, and to support engineering studies for future airport improvement projects.

BGR hosts a Foreign Trade Zone that consists of a 33-acre on-airport complex containing a central import processing building. There are 25 acres of industrial lots located within the zone. The site includes 29,000 square feet of heated warehouse or light manufacturing space.

In 2004, MaineDOT completed Phase I of the Aviation Systems Plan. This plan includes a detailed examination of airport facilities and needs, and an analysis and projection of overall system needs over the next 20 years. The Aviation Systems Plan serves as a guide to MaineDOT's airport investment decisions.

In addition to BGR, there are several small airports and landing strips along the corridor. These include runways in Brewer, Belfast, and Isleboro and helicopter landing sites at hospitals in Bangor and Belfast. Additional small runways are located to the east and west of the corridor. Among these facilities only BGR supports regular passenger and freight services.

Bangor International Airport
www.airnav.com/airport/KBGR

Belfast Municipal Airport
www.airnav.com/airport/KBST

Brewer Municipal Airport
www.airnav.com/airport/0B2

Isleboro Municipal Airport
www.airnav.com/airport/57B

2.1.6 Bicycle and Pedestrian Facilities

Western Penobscot Corridor
Bicycle Facilities. There are no bicycle facilities located along US 1A.

Shoulders. Most of US 1 and US 1A in the corridor have paved shoulders on both sides of the highway. Shoulders vary from two to ten feet in width, with most sections having shoulders eight feet wide. There are, however, significant portions of the corridor that have gravel shoulders. MaineDOT's shoulder paving policy anticipates paving these sections during future roadway reconstruction.

Trails. There are no trail facilities located within the corridor.

Sidewalks. Sidewalk facilities are limited to some of the village areas within the corridor, including downtown Searsport, Main Street in Stockton Springs, US 1A in the village area of Winterport, US 1A in the village area of Hampden, and in the Bangor urban area.

Eastern Penobscot Corridor
Bicycle Facilities. There are no dedicated bicycle facilities located along SR 15. However, the East Coast Greenway has recently been re-routed to traverse this corridor as noted below.

Shoulders. The urban areas of SR 15 in Bucksport and Brewer have paved shoulders ranging from four to eight feet in width. Other sections of the roadway from downtown Bucksport to Orrington have narrow paved shoulders ranging from two to four in width. US Route 1/SR 3 from Bucksport to Stockton Springs has paved shoulders ranging from six to 8 feet wide.

Sidewalks. Sidewalk facilities are limited to some of the village areas within the corridor including Brewer, Main Street in Bucksport, and Searsport.

Trails. The town of Bucksport has developed a trail network that connects the downtown and a riverfront walkway to local schools and recreational facilities at town-owned land at Silver Lake.

The Town of Orrington has proposed a series of trails that will connect the village area of Orrington located near Center Drive to the city of Brewer's proposed waterfront trails. The proposed trail will utilize low-volume roads and town-owned land for most of its length.

The city of Brewer has plans to expand its trail network to include an extension of the existing waterfront trail and promenade along the banks of the Penobscot River to create a continuous walkway from South Brewer to Freedom Park at the Penobscot Bridge. The Brewer Land Trust also oversees trails on its land holdings.

EMDC and HCPC worked with the city of Brewer and the towns of Orrington and Bucksport with the goal of developing a plan for a regional trail that parallels the Penobscot River and connects to the waterfront walkways of Brewer and Bucksport. The most promising routes for the proposed trail would follow power line and pipeline rights-of-way. These rights-of-way are already used by snowmobiles and ATVs and, if completed, would provide a regional trail connection between the greater Bangor area and coastal Hancock County.

In 2010 the East Coast Greenway (www.greeenway.org) adopted a Brewer-to-Bucksport route following a series of local roads connecting Brewer with Bucksport and thence east to Ellsworth along Route 1. While this route typically does not have paved shoulders, traffic volumes are low and several sections are scenic.

Bicycle and Pedestrian Plans

BACTS completed an update to the bicycle and pedestrian section of its Long Range Plan in 2009. This plan will be used to guide investments in the transportation system over the next 20 years. Bucksport is currently preparing a bicycle-pedestrian plan. Draft documents are posted online at www.hcpcme.org/bucksport.

2.1.7 Pipelines and Other Utility Rights-Of-Way

Maritimes and Northeast. Natural gas pipeline rights-of-way extend southerly from Brewer into South Orrington before crossing under the Penobscot River into Winterport. A lateral gas pipeline extends from the main line in South Orrington to the Verso Mill in Bucksport. Right-of-way for the pipeline is approximately 100 feet wide, except along the Silver Lake Road.

Bangor Hydro Electric Company (BHE). BHE operates a transmission line that extends southerly from Brewer to the Verso Mill in Bucksport with lateral lines to the Penobscot Energy Recovery Company and the former HoltraChem facility in Orrington. Right-of-way for the utility line is approximately 250 feet wide.

2.1.8 Public Transportation

Bangor Area Transit (BAT) – Community Connector. Hampden is served by the BAT – Community Connector, a fixed-route, federally subsidized bus service. The system is centrally operated out of Bangor, and provides interconnecting service across the federally designated urban area, in the communities of Bangor, Brewer, Hampden, Old Town, and Orono, moving about 900,000 passengers each year, system-wide. Hampden's ridership is approximately 42,000 per year. The Hampden route operates on an hourly schedule, Monday through Friday, from 6:15 a.m. to 6:10 p.m. The route follows US Route 1A from Bangor, right onto Western Avenue, left onto Mayo Road, left onto Kennebec Road, left onto Main Road (South), then left onto Western Avenue to the Hampden Hannaford Supermarket before returning to Bangor via Western Avenue and US Route 1A.

Downeast Transportation, Inc: DTI provides fixed-route services to many towns in Hancock County with connecting services to Bangor. The service mix changes periodically, but currently includes:

- a weekly Wednesday local shuttle around Bucksport
- a monthly (third Tuesday) Blue Hill-Bucksport-Bangor service.

Details are available at www.downeasttrans.org.

Penquis. Penquis is a nonprofit social service agency that operates the Lynx through its transportation division. The Lynx is an on-demand transportation service in Penobscot and Piscataquis Counties. The Lynx transports clients of various health and public service agencies such as the Department of Health and Human Services, Bureau of Medical Services, and Bureau of Mental Retardation. The Lynx also provides ADA paratransit service for clients of the BAT who cannot physically access the BAT service, even though they are located within 0.75 mile of the bus route. All Lynx transportation is provided via advance reservation. Lynx transportation is available to the general public on Thursdays for medical and grocery shopping needs within the urban area.

Waldo Community Action Partners. Waldo Community Action Partners (WCAP) operates a scheduled transit route from Belfast to Augusta, Waterville, Rockland, Bangor, and points in between for a nominal fee ranging from $1 to $5 one way. The agency also provides door-to-door transportation to medical appointments, personal business, or shopping for low-income families and individuals.

Washington-Hancock Community Agency (WHCA): WHCA, like Penquis Lynx and WCAP, provides on-demand, point-to-point transit services using a mix of buses and volunteer drivers for eligible riders. Riders are required to contact WHCA in advance to request transportation. Eligibility for some transportation services is based on DHHS referral or participation in MaineCare. Fee-based services are available when there are empty seats for a particular trip.

Go Maine. Go Maine is a statewide organization providing services and information to commuters and other travelers who live, work, or travel in the State of Maine, such as carpool ride sharing, vanpool formation, transit information, and bicycling and walking information. Go Maine works with commuters, employers, business groups, planning agencies, transit operators, and other local and regional partners throughout the state to build demand and advance the mutual goals of improved air quality, reduced traffic congestion, and lower commuter transportation costs.

In particular, where a critical mass of participant interest exists, Go Maine can assist the group in establishing a van pool or other ride sharing solution. Go Maine has been the recipient of federal funds to purchase vans in the past, and it is anticipated that this will continue. In other areas of the state, van pools have been successful when organized around groups of commuters working at single businesses, or working in a defined limited area such as a downtown.

2.1.9 Transportation Objectives

The transportation objectives listed below were developed by two corridor committees representing the Western Penobscot Corridor and the Eastern Penobscot Corridor. However, common themes emerged, resulting in a unified list of transportation objectives for the entire corridor.

- Highways: Identify and prioritize needed intersection and shoulder improvements to improve safety and mobility.
- Highway Route 1A: Improve safety standards for access to US Route 1A.
- Transit: Improve public transportation to serve the aging, disabled and limited-income populations, including expanded shuttle bus service, volunteer driver and taxi services to reach dispersed rural residences.
- Freight: Increase weight limits on Maine's interstate system to reduce heavy-truck impacts to the state highways.
- Freight: Improve efficiency of rail service to promote expanded use for freight.
- Freight: Improve marine, rail, and truck access to port facilities at Searsport.
- Freight: Explore the "inland port" concept, linking future port expansion at Searsport with the Bangor International Airport and other locations at Bangor and Hermon.

- Economic Development: Support traditional industries with high-quality transportation and communications infrastructure.
- Trails: Develop trails, bikeways and other alternative corridors connecting communities, schools, and venues for tourism, where appropriate.
- Transit: Promote school-town collaboration in providing community transit services.
- Water Transportation: Expand access to the Penobscot River for recreational and passenger excursions.

2.2 Land Use

Typical of many Maine arterial highways, commercial and residential development pressures along the major highways in the Penobscot Corridor result in increasing friction from driveways and entrances. Development presents local economic opportunities, but also reduces mobility while raising transportation costs for businesses and commuters, affects the efficient delivery of municipal services, and results in a higher number of entrance-related vehicle crashes.

The highest densities of population are found in the Bangor urban area. Elsewhere, there are pockets of medium density scattered along the corridor in village centers. Between 2000 and 2010, their population varied along the corridor as indicated in the population change map, below.

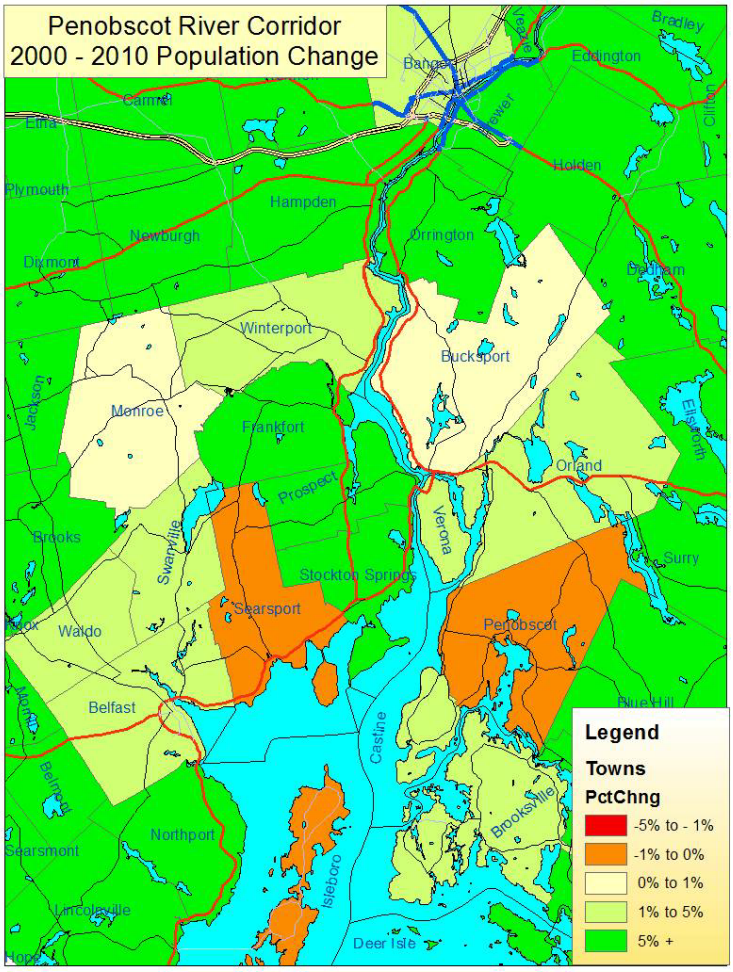


Figure 11. Population Change: 2000 - 2010

Overall, the population increased along the corridor, and the percentage of the population that forms the workforce has also increased. The three major employment destinations for corridor residents are Bangor, Bucksport and Belfast. Fast growth in the towns that are not employment centers is resulting in an increased number of longer commuting trips. The predominant mode of travel is the automobile.

The impact of expanding rural residential development is already being felt by transportation and social service providers in the region. Aging residents living in relatively remote rural homes are

creating a challenge for transit and paratransit providers and will require creative solutions to effectively serve an increasingly dispersed elderly and disabled population.

Low-density residential development is displacing traditional open space, agricultural, and timber lands in this corridor. The loss of farms and forests reduces the local production of food and wood products and increases municipal service costs. Towns benefit from somewhat higher property valuations and tax revenues, but will need to consider whether they value local agriculture and whether to take steps to preserve it.

2.2.1 Comprehensive Plans and Ordinances

Comprehensive planning for municipalities is mandated by the State of Maine, and many towns have accepted planning grants offered by the state to develop and implement plans. Funds to assist communities to develop plans, however, are scarce. Comprehensive plans are particularly important for a community for two reasons: (1) comprehensive plans provide a "blueprint" for a community's future growth needs, including transportation, infrastructure, and land use requirements, and (2) comprehensive plans form the supporting legal basis for local ordinances, which are the only measures available to control unlimited highway access (on roads other than arterials), inappropriate land uses, and strip development.

A land use ordinance is the local regulatory document that sets standards and permitted uses for future development. Beyond MaineDOT's access management regulations and the Natural Resources Protection Act (NRPA), the state of Maine has few tools to control development adjacent to its highways. The table below indicates ten of the corridor towns have locally adopted comprehensive plans and land use ordinances.

City/Town	Comprehensive Plan			Land Use Ordinance
	Adopted Locally	State Consistent	Year of Plan	Adopted
Bangor	Yes	Yes	2005	Yes
Brewer	Yes	Yes	1996	Yes
Bucksport	Yes	Yes	2003	Yes
Frankfort	No	No	NA	No
Hampden	Yes	Yes	2001	Yes
Hermon	Yes	Yes	1996	Yes
Orrington	Yes	Yes	2000	Yes
Prospect	Yes	Yes	1995	No
Searsport	Yes	Yes	2002	Yes
Stockton Springs	Yes	No	2005	Yes
Verona Island	Yes	Yes	2006	Yes
Winterport	No	No	NA	No

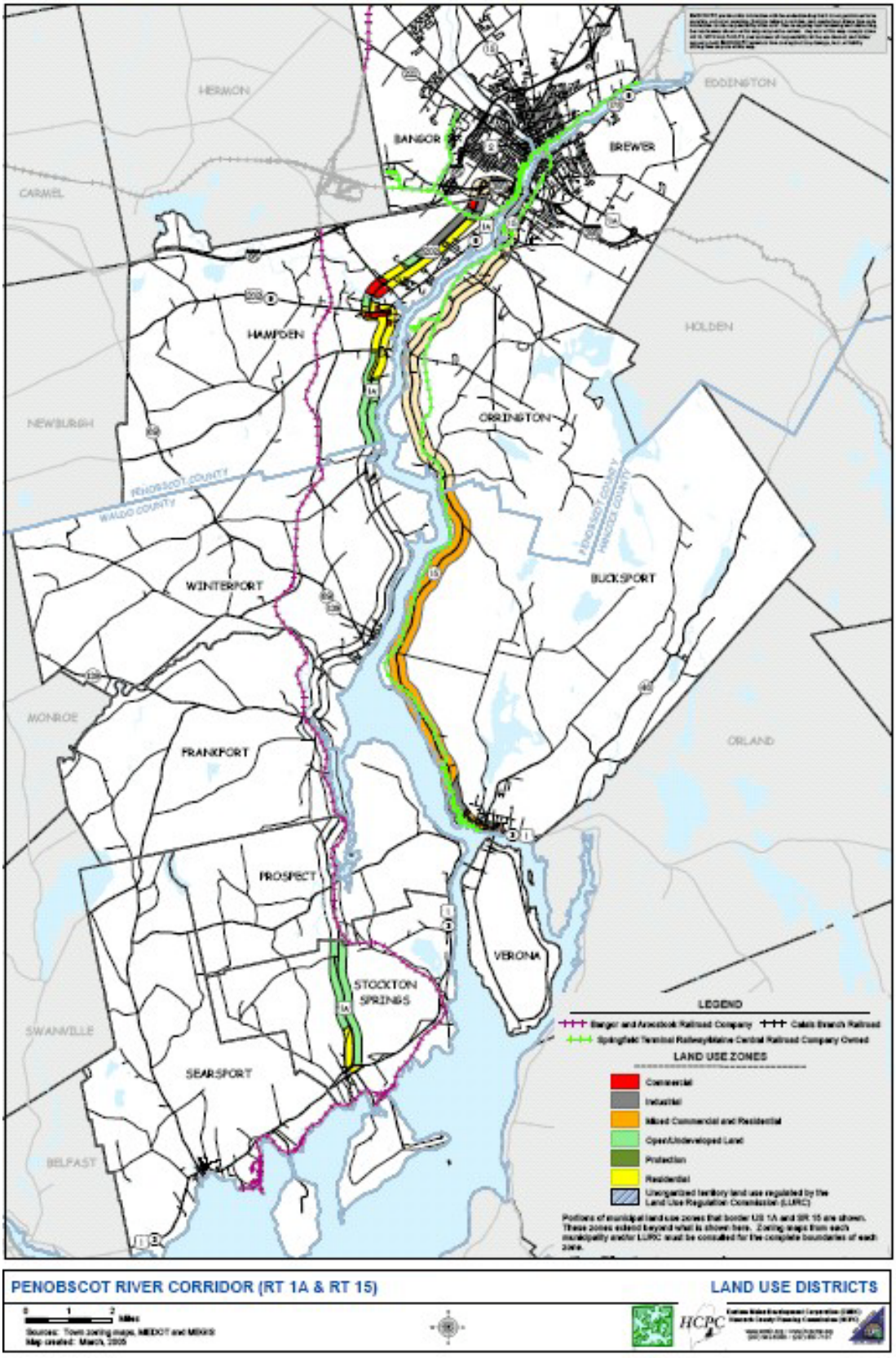


Figure 12. Land Use

Preserving mobility and enhancing safety along Maine's transportation corridors is an ongoing challenge due to a resistance by many towns to adopting comprehensive plans and town-wide zoning. Local and regional land use plans and ordinances are essential to preserving community character, managing development patterns, and protecting Maine's highways.

The Maine Legislature passed a law authorizing MaineDOT to regulate new curb-cuts and driveway entrances along arterial highways. The measure is aimed at preserving the capacity of Maine's highways and eliminating or at least deferring the need for costly highway improvements necessitated by poorly managed growth. The new law applies only to arterial roadways and considers both safety and capacity issues as the basis of design standards.

2.2.2 Land Use Objectives

The corridor committee identified the following objectives as being important to the future of the corridor and the region:

- Encourage residential and commercial investment in corridor service centers.
- Assist corridor towns to develop consistent comprehensive plans and land use ordinances to discourage inappropriate roadside development.
- MaineDOT should work with corridor communities to develop consistent, corridor-wide access management standards that complement state access regulations.
- Work with communities and businesses to develop an impact fee schedule for major projects that may impact mobility and safety along the corridor.

2.3 Review of Existing Plans

Northeast CANAM Connections: Integrating the Economy and Transportation. This study is a comprehensive analysis to determine what transportation infrastructure improvements are necessary to encourage economic development and address deficiencies in the Northeast Border Corridor. This region spans the states of New York, Vermont, New Hampshire, and Maine, and encompasses the neighboring provinces of Ontario, Québec, New Brunswick, Nova Scotia, Prince Edward Island, and Newfoundland and Labrador.

The CANAM study made the following recommendations:

- Support investment in both the Atlantic and Continental Gateway initiatives currently being pursued by the Canadian provinces.
- Pursue a pilot study for truck harmonization within the CanAm Region.
- Invest in a limited-access, truck-friendly northern east-west highway.
- Conduct a regional inland-port strategic analysis.
- Develop a regional tourism marketing strategy.
- Develop an interim plan for improving east-west short-line service.
- Invest in a high-speed intermodal east-west rail corridor.
- Invest in a limited-access, truck-friendly southern east-west highway.

The full report can be found at: http://www.canamconnections.com/

Cornell Report on Maine's Marine Port Infrastructure. The Cornell Report was commissioned by the Maine Port Authority to conduct an assessment of Maine's port infrastructure and to make policy and investment recommendations. The document will serve as a guide for the Port Authority. The report offers policy, organizational, and investment recommendations for the Maine Port Authority and Maine's three major ports. The entire study can be found at: http://www.maineports.com/PortStrategyStudy.html.

Gateway 1. Gateway 1 is a comprehensive transportation and land use planning process for the US Route 1 corridor from Bath to Prospect. The project involves local and regional stakeholders partnering with state agencies to find corridor-wide transportation solutions while encouraging economic development and preserving local quality of life. Read more about this ongoing project at: http://www.gateway1.org/ The Maine Department of Transportation withdrew from participation in Gateway 1 in 2011, but the towns are continuing the initiative with local resources.

Region 4 Transportation Assessment (RTA). The 2005 Region 4 Transportation Assessment is a regional planning document that identified all of the major corridors in eastern Maine. The report contains needs, deficiencies, and goals for each corridor and may provide guidance during the development of this corridor plan. More on the Region 4 Transportation Assessment can be found at: www.hcpcme.org/transportation/needs.

2007 SIPCRES (Strategic Investment Plan for Corridors of Regional Significance). This document is a refinement of the prior corridor-base Region Transportation Assessment or RTA. The goal of the RTA was to identify land use, transportation, and economic needs along Maine's most significant corridors dominated by the arterial highway system, but also including rail, water, air, and trail connections. The SIPCRES seeks to implement the RTA though identifying feasible short-term as well as more challenging, long-term investments. The SIPCRES is available at: www.hcpcme.org/transport.html.

BACTS Long Range Plan. The BACTS Long Range Transportation Plan 2004-2025 is the long-range transportation planning document for the Bangor metropolitan area. This long-range plan will be used to guide investments in the transportation system over the next 20 years.

2.4 Corridor Needs and Deficiencies

2.4.1 Western Penobscot Corridor

The corridor committee identified several needs and deficiencies related to the US Route 1A corridor. The committee noted that some of the concerns were located at specific locations within the corridor, while others are corridor-wide or regional, state, or federal in scope.

- The built-up nature of the Hampden village area is a hindrance to through-truck traffic. Heavy truck traffic also presents a hazard to pedestrians.

- Hampden school traffic reduces mobility and safety due to the school having direct access to US Route 1A in the village area.

- The intersection of US Route 1 and Trundy Road in Searsport should be realigned. The short turning radius impairs the turning movement of large trucks.

- Searsport needs a road that bypasses the downtown area during emergencies and public events. The proposed road would connect Belfast via the Old County Road with the Harris Road in Stockton Springs.

- The approach channel at Mack Point in Searsport needs to be deepened to a depth of 40 feet at low water. Currently, deep-draft vessels are limited to entering and leaving the facility during high tide.

- Narrow sections of US Route 1A through the Mendall Marsh and downtown areas of Frankfort create an operational and safety hazard for large trucks.

- MMA railroad is receiving an increasing number of grade crossing requests throughout the state. Additional grade crossings create operational and safety hazards and increase the railroad's maintenance costs.

- Heavy trucks traveling to the Hampden and Old Town landfills should use the US Route 202 bypass so as to avoid the Hampden village area. However, trucks weighing more than 80,000 pounds are not allowed on the interstate system, which connects with the northerly end of the bypass.

2.4.2 Eastern Penobscot Corridor

- Roads
    - Orrington: A high-crash segment at the Snows Corner intersection of Route 15 had 30 reported crashes between 1998 and 2008. Of these, 76% were either intersection movements or rear-end/sideswipe collisions. Alternative road designs should be considered that will reduce uncertainty for cars entering onto Route 15.
    - Orrington: Representatives also discussed the need for better pedestrian facilities at the Snows Corner intersection. The lack of sidewalks and crosswalks make it difficult to walk in this area.
    - Route 15: Traffic volume is declining in the Route 15 corridor. This unexpected pattern has raised concerns that traffic is diverting around the corridor using local roads. Additional research will be needed to determine whether this is the case and what steps are needed to maintain a good level of service on the arterial highway.

- Route 15: Lacks shoulders in several sections, making it unsafe for cycling and contributing to stop-and-start traffic when cyclists or pedestrians use the travel lane.
- Level-grade rail crossings present safety and efficiency concerns for drivers as well as rail operators.
- Route 46 presents many problems for truck movement. Several sections require major reconstruction, including the addition of paved shoulders.

- Rail
  - Observations of derailments, poor condition of tracks, and aging rolling stock.
  - Difficulty moving freight among different railroad operators leads to delays and uncertainty.
  - Difficulty balancing freight in and freight out. Additional coordination is needed to avoid deadheading ships, trains and trucks.
    - Wood and pulp coming in by truck
    - Paper going out by truck and rail
    - Clay coming in by ship and truck
    - Fuel oil coming in by tanker ship
    - Natural gas coming in by pipeline.

- Maritime
  - Shipping regulations may be hindering users of the blue highway. In particular, the Jones Merchant Marine Act is preventing non-U.S. carriers from carrying freight to other U.S. ports.
  - Need to bring cargo back by ship to avoid deadheading.

- Air
  - Bangor International Airport routes and schedules are not efficient for corporate travel. The time delays and lack of timely connecting flights causes some travelers to drive to Portland.

- Transit
  - Bucksport Bay Healthy Communities encourages additional transit services between Bucksport and Bangor, particularly to assist elderly residents of Bucksport to reach health services in Bangor.

3.0 RECOMMENDATIONS AND INVESTMENT STRATEGIES

The Corridor Committee identified several recommendations and investment strategies, discussed below, which attempt to address the corridor needs, deficiencies, and objectives outlined in this Corridor Management Plan. Some issues to note:

- The region's economy is of prime importance. The region relies on a wide variety of businesses and industries that use and rely on the transportation infrastructure.
- Energy costs will continue to be an important issue for consumers and businesses into the future.
- An aging population will also require more diverse transportation options. Expanding transportation alternatives and educating residents will prepare this region for the future.
- Health consequences of sedentary lifestyles suggest a need for safe opportunities to walk and bike, particularly in village areas.
- Legal and administrative barriers may hinder the efficient movement of freight.

3.1 Both Eastern and Western Corridors

1. *Consolidate excess railroad grade crossings*: This project identifies redundant local and private railroad crossings and identifies opportunities to encourage shared crossings, where feasible, to reduce maintenance costs and enhance safety.
   Location: Throughout corridor.
   Responsible Parties: MMA, Pan Am, MaineDOT, municipalities, landowners.
   Timeframe: Short-term.

2. *Invest in improvements in tracks and rolling stock for rail transportation*: Create a revolving loan fund for rail transportation investments, including reconstructing tracks and upgrading rail cars and locomotives.
   Location: Throughout corridor.
   Responsible Parties: MMA, Pan Am, MaineDOT, DECD, USDOT, Federal Rail Administration.
   Timeframe: Intermediate to long-term.

3. *Update existing or develop new comprehensive plans and land use ordinances consistent with adjacent towns which recognize the important link between land use transportation mobility.*
   Location: Throughout corridor.
   Responsible Parties: Municipalities, State Planning Office, MaineDOT, EMDC.
   Timeframe: Short-term to intermediate.

4. *Conduct a study to determine the feasibility of developing air cargo services at BGR for niche markets such as Maine lobster.*
   Location: Bangor.
   Responsible Parties: City of Bangor, MaineDOT.
   Timeframe: Short-term to intermediate.

5. *Improvement of navigation channels in the Penobscot River:* This project will conduct dredging in the Penobscot River to provide all-tide access for oceangoing vessels to Bangor and Brewer.
   Location: Penobscot River from Bucksport to Bangor and Brewer.
   Responsible Parties: Army Corp of Engineers, Coast Guard, MaineDOT, MaineDEP, municipalities.
   Timeframe: Long-term.

6. *Develop legal and logistical protocol for shipping on the "blue highway":* This initiative will assist manufacturers in balancing loads of inputs and exports to reduce transportation costs and overcome restrictions such as the Jones Merchant Marine Act.
   Location: Bangor, Brewer, Bucksport, Searsport.
   Responsible Parties: MaineDOT, businesses, Department of Marine Resources, federal agencies.
   Timeframe: Intermediate to long-term.

3.2 Western Penobscot Corridor

1. *Improve mobility and safety on US Route 1A (Searsport to Bangor) and Route 15 Brewer to Bucksport:* This project will improve the efficiency and safety of the corridor. The corridor currently accommodates a mix of commuter vehicles and heavy truck traffic associated with gravel extraction, the port at Mack Point in Searsport, and regional through-trucking. Improvements may include implementing access management techniques and constructing passing lanes to facilitate more efficient movement of goods between the port and northern and central Maine and beyond.
   Location: Throughout corridor.
   Responsible Parties: Municipalities, MaineDOT, landowners.
   Timeframe: Long-term.

2. *Improve crosswalks and pedestrian facilities in low-speed village areas using better signage, crosswalk lighting, and pavement markings:* This project will enhance safety for pedestrians in low-speed village areas.
   Location: Bangor, Hampden, Winterport, Frankfort, Stockton Springs, Prospect, Searsport, Orrington.
   Responsible Parties: MaineDOT, municipalities.
   Timeframe: Intermediate.

3. *Highway upgrades that support heavy-haul truck movements through the corridor:* These projects may include intersection turning radii improvements in Searsport, Hampden, and Bangor; constructing a connector road between US Route 202 and Main Street in Bangor via the Farm Road; truck climbing lanes; and improvements to roadway geometry in Frankfort.
   Location: Throughout corridor.
   Responsible Parties: MaineDOT, municipalities.
   Timeframe: Intermediate to long-term.

4. *Study the feasibility of developing an inland port in Bangor or Hermon*: This project will explore the feasibility of developing a containerized inland port, or intermodal facility, near Bangor or Northern Maine Junction and supported by future port expansion at Searsport.
   Location: Bangor-Hermon.
   Responsible Parties: MaineDOT, municipalities.
   Timeframe: Short-term to intermediate.

5. *Conduct a study to determine optimum location, right-of-way requirements, and costs to construct an alternative roadway around the downtown area of Searsport:* The majority of the proposed road will use existing local roads and should connect Belfast via the Old County Road with the Harris Road in Stockton Springs. The purpose of the proposed road is to provide an alternative route for traffic during emergencies and public events in Searsport's downtown area.
   Location: Stockton Springs, Searsport, Belfast.
   Responsible Parties: MaineDOT, municipalities, Waldo County.
   Timeframe: Short-term.

6. *Improvements to Mack Point, Searsport*: This project includes dredging of the approach channel to the Mack Point facility at Searsport. Port operations are hampered by shallow water depth, requiring deep-draft vessels to enter and leave the port facility during high tide.
   Location: Mack Point, Searsport.
   Responsible Parties: Army Corp of Engineers, MaineDEP, MaineDOT, Town of Searsport, Sprague Energy.
   Timeframe: Intermediate to long-term.

7. *Construct shoulders along US Route 1A to accommodate bicyclists and pedestrians from Frankfort to Prospect.*
   Location: Frankfort, Prospect.
   Responsible Parties: MaineDOT.
   Timeframe: Intermediate to long-term.

8. *Study the feasibility of fixed-route transit service between Belfast and Bangor.*
   Location: Throughout.
   Responsible Parties: MaineDOT.
   Timeframe: Short-term to intermediate.

9. *Establish vanpool and carpool routes between the Midcoast area and Bangor-Brewer:* This project will utilize an existing MaineDOT program, Go Maine, to create a new van or car pool route transporting commuters between the Midcoast area and the Bangor-Brewer area.
   Location: Throughout corridor.
   Responsible Parties: Municipalities, MaineDOT, businesses.
   Timeframe: Short-term to intermediate.

3.3 Eastern Penobscot Corridor

1. *Improve mobility and safety on Route 15 (Brewer to Bucksport):* This project will improve the efficiency and safety of the corridor. The corridor currently accommodates a mix of commuter vehicles and heavy truck traffic associated with paper manufacturing. Improvements may include implementing access management, constructing passing lanes, reducing level grade crossings and improving road shoulders to facilitate more efficient movement of goods and people.
   Location: Throughout the corridor, particularly unbuilt sections of Route 15.
   Responsible Parties: MaineDOT, Municipalities, HCPC.
   Timeframe: Long-term.

2. *Improve crosswalks and pedestrian facilities in low-speed village areas using better signage, crosswalk lighting, and pavement markings:* This project will enhance safety for pedestrians in low speed village areas. Crosswalks require a "safe landing" zone, such as sidewalks on both sides of the road.
   Location: Brewer; Orrington, particularly at Snows Corners; Bucksport Main Street; and Verona Island, connecting Bucksport and Penobscot Narrows Bridges.
   Responsible Parties: MaineDOT, Municipalities, HCPC
   Timeframe: Short and Intermediate

3. *Highway upgrades that support heavy-haul truck movements through the corridor:* Route 46 was particularly noted for sections of unbuilt and substandard construction in Bucksport and Dedham. Improvements should include better site distance, paved shoulders, and drainage improvements. Freight movement on Route 15 is impeded in part by level-grade rail crossings, inadequate shoulders, and increasing volumes of local traffic, particularly on the northern end in Brewer and the southern end at the bridge to Verona Island.
   Location: Throughout.
   Responsible Parties: MaineDOT, municipalities.
   Timeframe: Intermediate to long-term.

4. *Invest in improvements in tracks and rolling stock for rail transportation*: Create a revolving loan fund for rail transportation investments, including reconstructing tracks and upgrading rail cars and locomotives.
   Location: Throughout corridor.
   Responsible Parties: MaineDOT, DECD, USDOT, Federal Rail Administration.
   Timeframe: Intermediate to long-term.

5. *Continue testing fixed-route transit services between Bucksport and Bangor.*
   Location: Throughout corridor.
   Responsible Parties: MaineDOT, Downeast Transportation, Inc., HCPC.
   Timeframe: Short-term to intermediate.

6. *Establish vanpool and carpool routes between Bucksport and Bangor-Brewer:* This project will utilize an existing MaineDOT program, Go Maine, to create a new van or car pool route transporting commuters moving commuters.
   Location: Throughout corridor.
   Responsible Parties: Municipalities, Go Maine, MaineDOT, businesses.
   Timeframe: Short-term to intermediate.