5.0 Highway Transportation

5.1 Introduction

The highway network is the largest and most developed transportation system in the BACTS area. The overwhelming majority of people and goods are transported over the region's 183 miles of collector and arterial roadways. The present-day network has been shaped by a number of historical factors:

- The formation of compact urban centers around major waterways in the 18th and 19th centuries, and the development of primitive roadways for pedestrians and horse-borne travelers and traders;
- The mass production of motor vehicles and subsequent construction of the Maine state highway system from 1925 to 1960, including the construction of Interstate I-95 during the 1950s and subsequent development in areas close to the exit ramps; and
- The opening of the I-395 spur including the third Penobscot River Bridge in the mid 1990's.

In 1991, Maine adopted the Sensible Transportation Policy Act (STPA) to help reduce demands on the highway system. In 2003 and 2007, the State Legislature amended the Act to mandate a better connection between transportation and land use planning – and, specifically, between the STPA and the State's Growth Management Act. The common goals of the two laws include facilitating orderly growth and development, promoting economic development, reducing impacts on natural and cultural resources, and providing better solutions to transportation problems. Importantly, both laws recognize that transportation and land use patterns operate at a regional scale, and both encourage inter-community planning, financing, and regulation. The BACTS highway inventory, as a result, has remained essentially static for the past 25 years.

Sustainability and livability have been important characteristics of transportation planning for decades. Recently, they have gained more widespread and formalized attention due to tighter budgets, people's desire for more transportation choices with easy transitions between modes, people wanting better quality of life where they live and work, and climate change issues being considered. BACTS has worked on improving sustainability and livability in our area and is committed to continuing these efforts. Land Use, sustainability, livability, and environment are discussed in detail in Chapter 11.

5.2 Existing Conditions

Federal Functional Classification System

The federal functional classification (FFC) system designates all urban roads within one of six possible categories, based on their capacity and strategic significance within the highway network. These classifications are from highest to lowest: principal arterial-Interstate (hereafter referred to as "Interstate"); principal arterial-other (hereafter referred to as "principal arterial"); minor arterial; major urban collector; minor collector and local. Local roads are excluded from the BACTS inventory, falling under the jurisdiction of each municipality. For the remaining functional classifications, BACTS receives federal funding based on the total mileage for each classification within the highway network. Table 5.1 lists the lane mileage by FFC within the BACTS area. A listing of all the arterials and collectors currently in the BACTS planning area is presented in Table B.1 in Appendix B.

Table 5.1 Federal Functional Centerline (Lane) Mileage

Municipality	Major Urban Collector	Minor Collector	Minor Arterial	Other Principal Arterial	Principal Arterial Interstate	Total Mileage
Bangor	35.32 (74.39)	1.30 (2.60)	19.52 (47.22)	6.97 (18.41)	30.36 (50.53)	**93.47 (193.15)**
Bradley	2.70 (5.40)	0	0	0	0	**2.70 (5.40)**
Brewer	4.16 (8.40)	0	2.40 (4.97)	10.54 (25.87)	10.08 (16.47)	**27.18 (55.71)**
Hampden	1.87 (3.63)	0	3.61 (7.30)	7.72 (16.38)	2.48 (4.40)	**15.68 (31.71)**
Hermon	.77 (1.53)	0	0	0	1.93 (3.71)	**2.7 (5.24)**
Milford	1.22 (2.44)	3.56 (7.23)	0	0	0	**4.78 (9.67)**
Old Town	11.71 (23.25)	0.2 (0.4)	6.31 (14.58)	0	.01 (.01)	**18.23 (38.24)**
Orono	1.73 (3.41)	1.09 (2.18)	7.57 (16.24)	0	.59 (.59)	**10.98 (22.42)**
Orrington	.01 (.04)	3.28 (6.58)	0	0	0	**3.29 (6.62)**
Veazie	.31 (.56)	0	1.91 (3.81)	0	2.15 (4.29)	**4.37 (8.66)**
Total	**59.80 (123.05)**	**9.43 (18.99)**	**41.32 (94.12)**	**25.23 (60.66)**	**47.60 (80.00)**	**183.38 (376.82)**

The federal functional classifications have special significance in relation to the Penobscot Indian Nation. The BACTS metropolitan area includes Indian Island, but all roads on the island are currently classified as local and therefore not included in the BACTS highway inventory. The Penobscot Indian Nation is represented on the BACTS Policy Committee with a voting member.

National Highway System

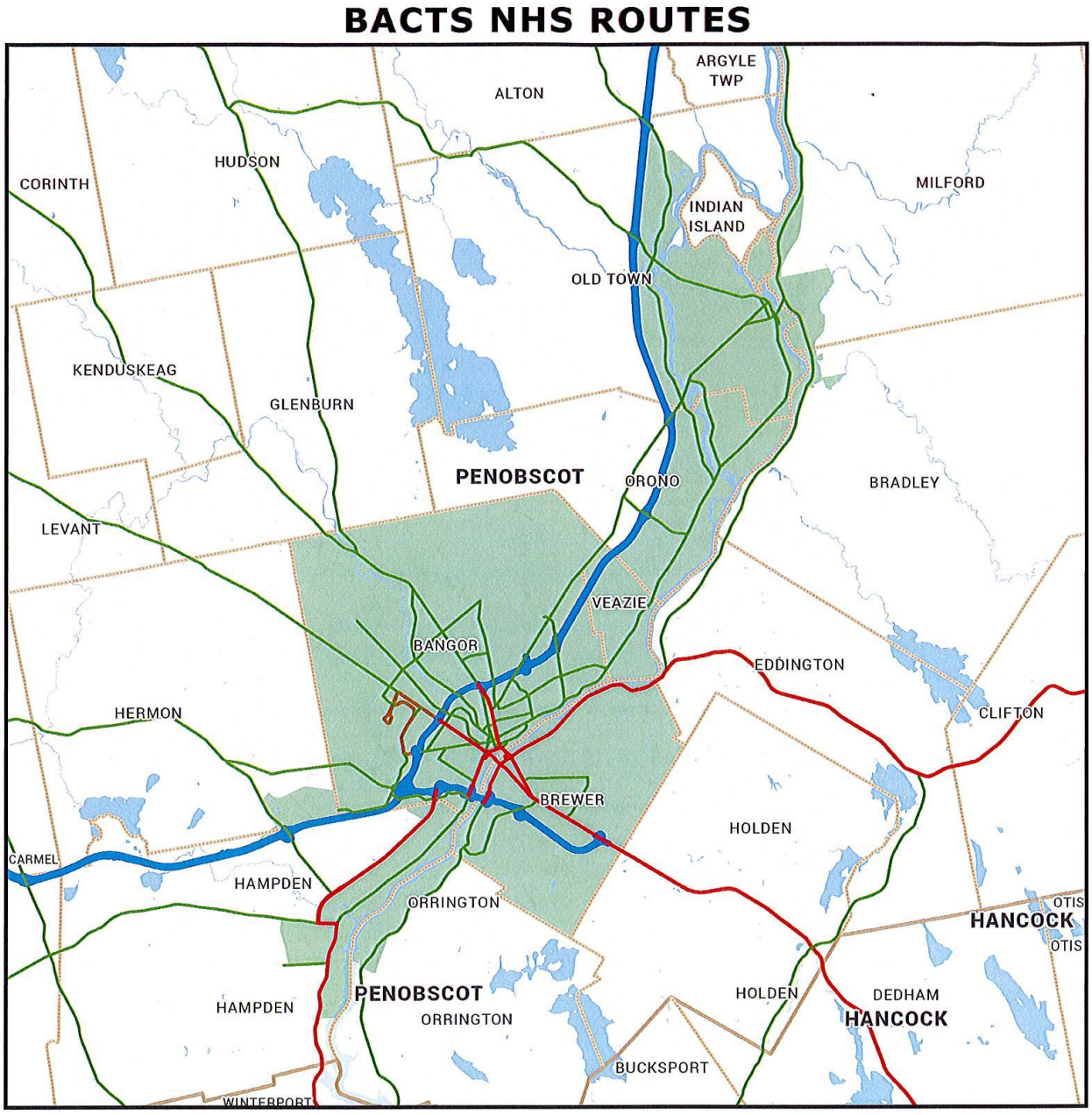
The National Highway System (NHS) concept was a cornerstone of the original Intermodal Surface Transportation Efficiency Act (ISTEA) legislation, and development of the NHS remains a high priority under the Fixing America's Surface Transportation (FAST) Act. The purpose of the NHS, according to ISTEA (Section 1006), is to "provide an interconnected system of principal arterial routes which will serve major population centers, international border crossings, ports, airports, public transportation facilities, and other intermodal transportation facilities and other major travel destinations; meet national defense requirements; and serve interstate and interregional travel." More than one-third of all federal transportation funds are dedicated to the maintenance and improvement of NHS roads.

The National Highway System (NHS) includes the following subsystems of roadways:

- Interstate: The Eisenhower Interstate System of highways retains its separate identity within the NHS.
- Other Principal Arterials: These are highways which provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.
- Intermodal Connectors: These highways provide access between major intermodal facilities and the other four subsystems making up the National Highway System.
- Strategic Highway Network (STRAHNET): This is a network of highways that are important to the United States' strategic defense policy. They provide defense access, continuity and emergency capabilities for defense purposes. There are not any of these in the BACTS area.
- Major Strategic Highway Network Connectors: These highways provide access between major military installations and highways that are part of the Strategic Highway Network. There are not any of these in the BACTS area.

The following highways are designated NHS routes in the BACTS area and are shown in Figure 5.1:

Figure 5.1



The Maine Department of Transportation provides this publication for information only. Reliance upon this information is at user risk. It is subject to revision and may be incomplete depending upon changing conditions. The Department assumes no liability if injuries or damages result from this information. This map is not intended to support emergency dispatch.

3.5 Miles

1 inch = 4.09 miles

Date: 9/28/2017
Time: 7:53:07 PM

LEGEND

National Highway System 2

- NHS - Interstate
- NHS - Other
- NHS - Intermodal connector
- Fed aid non-NHS

Interstate:

- Interstate 95 (I-95);
- Interstate 395 (I-395);

Other Principal Arterials:

- Bangor: I-395 off ramps to Main St. (Route 1A). Route 1A continues north to Cedar St.; then east to Summer St.; then north to Union Street and to the Brewer city line on the Chamberlain Bridge.
- Brewer: Wilson Street (Route 1A) from Bangor city line on the Chamberlain Bridge east to the Holden town line.
- Bangor: Broadway (Route 15B) from the I-95 southbound on ramps east to Oak Street and continuing east to the Brewer city line on the Penobscot Bridge.
- Brewer: State Street from Bangor city line on the Penobscot Bridge east to Wilson Street (Route 1A).
- Bangor: Union Street (Rt. 222) from I-95 northbound off ramp east to Summer Street (Route 1A).
- Bangor: Independence Street from Union Street (Route 222) north to Washington Street continuing north to Oak Street (Route 15B).
- Brewer: Main Street (Route 9) from Betton Street (Route 15B) north to the Eddington town line.
- Brewer: Main Street (Route 15B) from the I-395 eastbound off ramp to Betton Street; west to Penobscot Street to State Street.
- Hampden: Main Road South (Route 1A) from Kincaid Road north to Western Avenue (Route 9); then west to US Route 202; then north to I-395 in Bangor.

Intermodal Connectors:

- Bangor: Hammond Street from I-95 northbound off ramp to Maine Ave to Godfrey Blvd to the Airport Terminal; and
- Bangor: Union St. from I-95 northbound off ramp to Godfrey Blvd to Airport Terminal.

<u>I-395/Route 9 Connector</u>

MDOT has investigated various options for a safer and more efficient route for east-west traffic across Maine for decades. In the Bangor region, the focus for this route has been primarily from the end of I-395 near the Brewer/Holden line to Route 9.

MDOT began an Environmental Assessment (EA) Study in 2000 under the National Environmental Policy Act (NEPA). A Public Advisory Committee (PAC) was formed and numerous meetings were held between 2001 and 2003. The PAC, MDOT and FHWA analyzed more than 70 alternative routes, shown on Map in the Appendix B. The PAC retained Alternative 3EIK-2 and the No Build options for more detailed analysis, but in 2005, based on environmental concerns, the study was elevated to an Environment Impact Study (EIS), beginning the analysis and review again.

In the spring of 2009, based on the greater environmental impacts with the central alternatives, the federal agencies requested that Alternative 2B-2 be reconsidered. In December 2010, MaineDOT and the agencies identified four alternatives for final consideration: No Build, Alternative 2B-2, Alternative 5A2B-2, and Alternative 5B2B-2.

In October 2011, MaineDOT and the agencies identified Alternative 2B-2 as the Preferred Alternative. In 2012 the Draft Environmental Impact Statement (DEIS) was published, and a formal public hearing was held on the DEIS. In 2013, the US Army Corp of Engineers (USACE) issued their determination that Alternative 2B-2 was the Least Environmentally Damaging Practicable Alternative (LEDPA).

In November of 2013, the US Fish and Wildlife Service (USFWS) requested additional consultation based on the proposed listing of the Northern Long Eared Bat and in 2015, the Final Environmental Impact Statement (FEIS) was completed.

In June 2016, FHWA issued the Record of Decision (ROD). The ROD identified "Alternative 2B-2, shown on Figure 5.1, as the preferred alternative. As the environmentally preferred alternative, it was selected as the build alternative to be designed, and built. This was the final step in the NEPA process.

This completion of the NEPA process allowed MaineDOT to begin final design and the right-of-way process. The schedule presented by MDOT at the July 20, 2016 Public Meeting in Eddington is shown in Table 5.2 below.

Table 5.2

Survey	2016/2017
Preliminary Design	2017/2018
Preliminary Public Meeting	2017/2018
Final Design	2017/2020
Final Public Meeting	2019/2020
Construction Begin	2021/2022
Open to Traffic	2023/2025

For more information on the I-395/Route 9 Connector see:
http://maine.gov/mdot/projects/I395rt9connector/ .

Interstates 95 and 395

There have been many attempts for years to allow 100,000 pound trucks on the Maine Interstate system. In 2009, the United States Senate authorized a one-year pilot project allowing trucks up to 100,000 pounds on the Maine Interstate system. A report was requested as part of this pilot project, listing impacts found during this period. Maine DOT finished the report in 2010 titled, *Interstate Highway Truck Weights*. The report stated that allowing 100,000-pound trucks on Maine's Interstate system would result in a net benefit to the entire transportation system.

In 2011, the U.S. House and Senate passed a transportation bill that included allowing trucks weighing up to 100,000 pounds on the Maine Interstate system for the next 20 years. This change allows heavy trucks on the Interstate rather than on secondary roads. It should provide safer secondary roads and reduce the rate of pavement deterioration caused by the heavy trucks on these roads.

A Maine DOT study along I-95 in Bangor was completed in January 2011. The purpose of the study was to evaluate the long-term needs of the I-95 Corridor in Bangor and to identify a set of recommendations to provide safe and efficient transportation service through the year 2030.

With the growth of traffic that has occurred in the 55 years of its existence, I-95 is facing greater challenges in meeting the safety and mobility needs of its users. Incidents anywhere along the highway create traffic hazards that can temporarily reduce highway capacity and produce massive traffic backups. On and off-ramps designed over 50 years ago are operating poorly under today's traffic volumes. The goal of the Bangor I-95 Corridor Study is to provide a direction for future investments in this corridor to address these deficiencies and ensure that I-95 can function effectively into the future.

Study recommendations included:

- Increase acceleration and/or deceleration lengths at interchange ramp junctions;
- Improve intersections at/near interchanges;
- Create park and ride lot;
- Improve bridge surface sensing;
- Upgrade median treatment;
- Modify lane use signing;
- Plan freeway management system;
- Implement service patrol;
- Install traffic monitoring;
- Evaluate future potential for new interchange north of Hogan Road; and
- Evaluate future potential of a new northbound on ramp at the Exit 186 interchange.

Several of these recommendations resulted in construction projects on or near I-95 and I-395 in the last six years. Some of the major projects were:

- Replacement of Hammond Street and Union Street I-95 overpass bridges;
- Replacement of I-395 bridge over Webster Avenue;
- Realignment of Union Street northbound on ramp;
- Improvements to Broadway, southbound ramp intersections, and Alden Street;
- Improvements to the Orono Exit 193 northbound off ramp and Stillwater Avenue intersection;
- Placement of raised median barrier on I-95 near Broadway; and
- Realignment of the end of the I-95 off ramp at Stillwater Avenue to allow left turns.

There are several projects in the planning stage for the I-95 corridor. The most significant project is constructing a diverging diamond interchange at Hogan Road. Currently this interchange has safety concerns, congestion and no adequate bicycle and pedestrian access. The diverging diamond interchange design addresses each of these concerns. It is planned for construction within the next three years. More information on this design is available at http://www.maine.gov/mdot/projects/bangor/ddi/.

Several I-95 bridges are scheduled for reconstruction or replacement including the Ohio Street and Broadway overpasses. I-95 acceleration and/or deceleration ramps are being analyzed for possible lengthening and realignment at various interchanges along the Bangor corridor. More new variable message signs are scheduled for placement along the state's I-95 corridor. A study of the I-395/ Odlin Road intersection and nearby I-95 southbound ramps is included in the BACTS CY 2018-2019 work plan.

BACTS has included in the draft CY 2018-2019 UPWP a BACTS Road Pavement Analysis and Recommended Action Plan that will include an inspection of the BACTS road system network and collecting pavement-related data. This data will then be used to formulate optimum strategies to maintain and improve these roadways. This project is scheduled for the second half of 2018.

Traffic Volumes

MaineDOT has historically monitored traffic growth in the BACTS area using fixed and movable monitoring systems. MaineDOT conducts, on a rotating basis, 48-hour traffic counts on selected routes to calculate the Annual Average Daily Traffic (AADT) carried by a particular highway. BACTS has an in-house 48-hour traffic count program that increases the number of annual counts performed on roads in the BACTS area. This permits a more timely response to specific requests from individual BACTS

municipalities and reduces the backlog of MaineDOT traffic counts within the region. Most importantly, the BACTS counts are directional whereas the majority of MaineDOT counts are total vehicle only. Table B.2 in Appendix B provides AADT and percentage growth figures for points along major BACTS traffic corridors since 2003.

Truck Traffic

The *Maine Integrated Freight Strategy Final Report* produced for Maine DOT in 2014 stated that 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. In 2011, 92 million tons of freight moved into, out of, or within, the State. 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). Consistent with past trends in the State, trucking is still the dominant mode of freight transportation in the State.

An article in the Bangor Daily News on September 19, 2017 by Matthew Stone titled, "*This Bangor industry reflects all the rest — and it's slowly shrinking and moving south",* states that the massive closures of the paper industry in this area has had a dramatic effect on the region's trucking industry. Total employment at trucking firms in Penobscot County dropped more than 29 percent between 2007 and 2016, to 1,245 from 1,763. The industry's total Bangor-region output shrank more than 17 percent between 2007 and 2014, to $106 million from $128 million.

The BDN article states, the major trucking companies in the area have had to shift their business south to survive. Hartt Transportation Systems Inc. finished work on a new, $7 million terminal in Auburn, Maine in 2015 and about 200 of the company's 440 trucks are based there. They opened a Sumter, South Carolina, terminal in 2006 to serve a manufacturing customer that also has operations in Auburn. Today, South Carolina is the home base for 175 to 200 of Hartt's trucks.

Barry Pottle, president and CEO of Bangor-based Pottle's Transportation, told Matthew Stone, "When your customers all move out of the area, you have to follow them." For Pottle's, that means the company's Allentown, Pennsylvania, terminal — which is about 15 years old — is much busier than its Bangor operation. Allentown is in the heart of a region where major retailers, both brick-and-mortar and online, have been setting up and expanding distribution centers to supply the Northeast. About 65 percent of Pottle's drivers are based in Allentown.

Stone reported that H.O. Bouchard in Hampden was affected by the housing market collapse a decade ago. The collapse caused their loads of lumber to go from 50 a day to zero, and stayed at zero," Today, H.O. Bouchard's specialty is in tanker trucks equipped for hauling heating fuels and liquid asphalt for road construction, as well in dry-bulk cement trailers for hauling cement powder.

An area of hope for more trucking in the area is Poland Spring's plans to pump water and possibly locate a bottling plant in Lincoln. Poland Spring has said it will truck water it pumps from the Lincoln Water District to its existing Maine bottling plants. As for locating a bottling plant in the region, the company has said the availability of faster rail service would factor into its decision. In a statement, the company said it would use "the most efficient combination of transportation services" if it located a bottling plant in the Lincoln area.

BACTS Truck Route Study

A study performed by Gorrill Palmer Consulting Engineers Inc. for BACTS in 2007 identified a list of spot improvements at specific locations impacted by trucks on the local street system. While these improvements are no substitute for a change in regional policy, they should aid in increasing truck mobility and safety for the interim period. Those locations include:

- Bangor-Route 1A railroad underpass at Mobil Depot
- Bangor-Route 2 (Hammond Street) at Odlin Road.
- Bangor- Perry Road at Farm Road.
- Bangor- Griffin Road at Union Street.
- Bangor Route 202 at Mecaw Road.
- Bangor-Main Street at Union Street.
- Bangor – Hancock Street at Oak Street.
- Bangor – Broadway at Griffin/Burleigh Road
- Bangor Hildreth Street at Outer Hammond Street.
- Bangor- Harlow Street at Kenduskeag Avenue.
- Bangor–Washington Street at Broad Street.
- Brewer–State Street at Wilson Street.
- Brewer–Wilson Street at North Main Street.
- Brewer Route 15 near Orrington Town Line
- Brewer- State Street at North Main Street.
- Hampden- Route 1A at Coldbrook Road.
- Old Town–Route 2 (Main Street) and Water Street at Route 2A
- Old Town-Route 16

Now that 100,000 trucks are allowed on the Interstate, many of these locations no longer have many trucks trying to negotiate difficult maneuvers. The BACTS Policy Committee will consider updating the Truck Study in the near future. In the meantime, if BACTS or Maine DOT considers any construction at any of these locations, truck design will be considered in that design.

Many BACTS communities restrict truck traffic on certain local roads. However, only the City of Bangor formally identifies specific roads as designated truck routes. Bangor seeks to direct truck traffic away from sensitive land uses and onto compatible roadways.

Traffic Signals

The primary function of traffic control signals is to assign the right-of-way at intersecting streets or highways where, without such control, a continual flow of vehicles on one roadway would cause excessive delay to vehicles (or pedestrians) waiting on the other roadway. A properly designed, operated and maintained traffic control signal can be a very valuable device for the control of vehicle and pedestrian traffic.

New technology in traffic signals has resulted in improved system components and tools for traffic control signal operations. Software programs have been developed to monitor traffic signals and traffic patterns from a central command center. BACTS has five coordinated corridor systems set up within its boundaries.

Each BACTS municipality is responsible for signal operations and maintenance within their boundary. BACTS has developed an inventory of equipment and their locations in the past. Recent warnings

concerning arc flash liability when opening a traffic signal control cabinet has prompted the necessity of only allowing certified traffic signal technicians to open the cabinets. Maine DOT is working to offer this certification training to anyone who works on these signals.

The Maine DOT Commissioner recently tasked a Traffic Mobility Working Group with investigating highway congestion issues in Maine and producing a report outlining the issues and recommending solutions that could reduce congestion. The Working Group has recognized the two major reasons for traffic congestion in Maine, inefficient traffic signal systems and traffic incidents on principal arterials like the Maine Turnpike and the Interstate system. Some of the preliminary suggestions are for Maine DOT to take responsibility of the maintenance of traffic signals on Priority 1 and 2 Corridors, and to encourage more Traffic Incident Management (TIM) statewide coordination and training of first responders. The report is due out by the end of 2017.

Traffic signals are an essential element of Intelligent Transportation Systems (ITS). ITS encompasses a broad range of wireless and wire line communications-based information, control and electronics technologies. ITS, when integrated into the transportation infrastructure, and in the future, into personal vehicles, will help monitor and manage traffic flow, reduce congestion, increase safety and reduce travel costs.

MaineDOT currently has permanent variable message signs (VMS) installed in 4 areas within the BACTS Region. Along the I-95 Corridor there are two VMS, one located in Hampden and one in Bangor. In Brewer there is one on I-395 and the final VMS is located on Route 9 in Eddington. In addition to these variable message signs, the MaineDOT also has eleven variable speed signs (VSS) which have cameras in them to monitor weather conditions and traffic congestion and alert drivers to decrease their speed. These are located along the I-95 Corridor between Hampden and Old Town. MaineDOT is currently planning to replace existing VMS and VSS along the I-95 and install additional signs ensuring a sign between each Interstate exit in the Bangor/Brewer area. These signs will be used in part to alert drivers of traffic incidents ahead and provide guidance for detours if needed.

The Statewide Traffic Incident Management team is in the planning stages of developing detour routes along the Maine Interstate system in the event of major incidents. These routes would be signed and the VMS would indicate which detour to take. BACTS and MDOT are also investigating a special traffic signal timing plan for all signals along these routes that could be triggered when the detour is needed.

Transportation Crashes

According to Maine DOT's statistics, in 2014 Maine experienced its lowest number of fatalities (131) since 1996. Unfortunately, the next year the number of fatalities rose to 156. A crash rate is defined as the number of crashes per hundred million vehicle miles (hmvm) driven. Maine's crash rate decreased in 2011, but is above the national average. Maine's crash rate is 215.6 crashes per hmvm. The latest national rate in 2006 was 198 crashes per hmvm. Maine's fatality rate of 1.07 fatalities per hmvm is a decrease over 2007's rate of 1.22 fatalities per hmvm. Maine's fatality rate continues to be below the national rate of 1.27 fatalities per hmvm.

MaineDOT obtains and analyzes reported crash data from the Maine State Police to determine high-crash locations throughout the state. The standard comparison statistic is known as the Critical Rate Factor (CRF). The CRF is determined by comparing the historical crash rate on a section of roadway (link) or intersection (node) to what would be expected based on road type, traffic volume, and a statewide average of crash rates at similar locations. A CRF greater than 1.0 indicates that the number of crashes exceeds expectations (the location is more dangerous than average), while a CRF less than 1.0 indicates that the

location is safer than average. A node or link must have a CRF of more than 1.0 and at least eight reportable crashes occurring over a three-year period to meet the criteria for listing as a high-crash location.

Each year, MaineDOT publishes a list summarizing the previous three years' worth of crash data and identifies high-crash locations statewide. According to the 2014-2016 edition, there were 82 high-crash locations on BACTS roads in six of the ten BACTS municipalities: 63 in Bangor, 5 in Brewer, 3 in Old Town, 8 in Orono, 2 in Milford, and 1 in Hampden.

Table 5.2 below lists BACTS highway locations that are considered especially serious due to a CRF of 3.0 or greater, 20 or more crashes in a three-year period, or both.

Table 5.3 High Crash Location

Intersection Location	Town	CRF	No. of Accidents
Exit 182: I 395 EB weave at I 95 SB off ramp and I 95 NB on ramp	Bangor	4.88	28
Broadway, Earle Av, and Center St slip lane	Bangor	4.69	33
Exit 182: End of I 95 SB off ramp at I 395 WB	Bangor	4.64	18
Longview Dr and Springer Dr	Bangor	4.30	9
Exit 182: I 95 SB weave at I 95 SB on ramp and I 395 WB off ramp	Bangor	3.55	25
Essex St and Grandview Av	Bangor	3.41	11
Exit 184: I 95 SB cross of Union St off ramp with Ohio St on ramp	Bangor	3.21	9
Broadway, Burleigh Rd, and Griffin Rd	Bangor	1.72	45
Griffin Rd and Ohio St	Bangor	1.64	44
Stillwater Av at end of I 95 NB off ramp and Kohl's parking lot entrance	Bangor	1.36	48
Hancock St, Otis St, and State St	Bangor	1.27	32
Bangor Mall Blvd, Hogan Rd, and Springer Dr	Bangor	1.21	41
Griffin Rd and Union St	Bangor	1.13	33
Parkway South and Wilson St	Brewer	1.13	30
Main St and Wilson St	Brewer	1.11	32

Source: MaineDOT, Traffic Engineering, Crash Records Section

BACTS Area Planning Studies

BACTS has contracted with consultants on several transportation planning studies since 2011. A summary of these studies is listed below.

BACTS Old Town-Milford Route 2 Traffic Study

This study conducted by James Sewall Company in 2014, examined the section of Route 2 beginning at the County Road intersection and continuing to Main Street in Old Town. During the school year, weekday morning traffic was very high travelling in the westbound direction along Route 2 from Milford to Old Town. Between the morning hours of 7:00 AM to 8:00 AM, significant delays and vehicle queuing was experienced along Route 2 by motorists coming from Milford and wishing to travel through downtown Old Town. Delays were also experienced for Old Town eastbound motorists on Center Street (Route 2) during the evening peak hour; however, these delays were typically not as lengthy as those experienced during the morning periods in Milford.

The purpose of this study was to review the current operation of the major intersections within this portion of Old Town and Milford and to determine if minor modifications to the traffic signal timing, phasing, and lane use might help alleviate some of the delays and congestion that are typical during the weekday commuting periods. In addition, this study included a traffic signal warrant analysis for the intersection of County Road and Route 2 to determine if a traffic signal installation was warranted at this intersection.

Some of Sewall's major recommendations for this study were:

- Utilize a shorter traffic signal cycle length during the weekday morning and evening peak hours at the intersections of Center Street/Main Street and Center Street/Water Street.
- Change the lane use for the westbound exclusive left turn lane at the intersection of Water Street/Center Street to a combined left-through lane, to reduce delays and queuing. Provide additional signage to help motorists navigate through the two closely spaced intersections.
- The Route 2 – County Road intersection did not warrant a traffic signal at that time.

A copy of this study is on the BACTS website at:

Bangor Broadway Corridor Study

This study conducted by TY Lin International in 2015, examined the Broadway corridor in Bangor from the southerly intersection of the Interstate 95 Northbound On-Ramp approximately 0.8 miles north to Grandview Avenue.

The two primary study goals were to:

- Preserve existing roadway capacity over the long term (2035 design year) to facilitate through traffic movement and minimize congestion while providing safe vehicular access to new and existing development along Broadway; and
- Maintain the functional integrity and safety of the corridor, while accommodating the public and private needs for access and adjacent land parcels.

Some of TY Lin International's corridor recommendations were to:

- Retime, coordinate and upgrade traffic signal equipment.
- Restripe Broadway for a wider curb lane for better bicycle conditions.
- Implement corridor-wide ADA improvements.
- Add/enhance existing sidewalk and crosswalks.
- Implement access management/driveway improvements on Broadway.
- Revise the site plan review standards to include consideration of inter-parcel connections, shared parking, and either shared driveways or a minimum of one curb cut fronting Broadway.
- Meet Bangor's Complete Streets Policy.

Further details of this study can be found on the BACTS website at: http://bactsmpo.org/transportation-studies/.

Old Town Stillwater Avenue Corridor Study

This study conducted by Gorrill-Palmer in 2017, examined the Stillwater Avenue corridor from The Orono-Old Town line to the College Avenue intersection.

Maine DOT was preparing to replace the two bridges over the Stillwater River on this corridor and the College Avenue intersection was not operating at maximum efficiency.

The study goal was to determine what improvements could be made along this section of Stillwater Avenue and its approaches to result in a vibrant Complete Street, safely serving not only motorized traffic and transit at an acceptable level of service, but also non-motorized users such as bicyclists and pedestrians.

Some of Gorrill-Palmer's corridor recommendations were to:

- Improve the two signalized intersection's antiquated traffic signal systems and comply with ADA standards.
- Improve each of the corridor's intersections geometry to provide clear, safe guidance for all users.
- Provide travel lane edge lines along the corridor to provide a shoulder for bicyclists to ride and possibly slow Stillwater Avenue traffic.
- Tie in the improvements recommended in this study with the MaineDOT bridge project. That project will be replacing the Stillwater Avenue bridges with a single travel lane in each direction, shoulders to accommodate bicycles, and a sidewalk on the westerly side to accommodate pedestrians.
- Widen the College Avenue approaches to Stillwater Avenue and Stillwater Avenue from College Avenue to the Stillwater River bridges to allow more capacity at the Stillwater Avenue-College Avenue intersection.
- Improve safety and access to the businesses immediately north of the College Avenue intersection with a functional center turn lane.
- Pedestrian facility improvements are proposed throughout the study area to better accommodate
- pedestrians.

A copy of this study is located on the BACTS website at: http://bactsmpo.org/transportation-studies/.

Proposed Orono Park Street Study

Over the last decade, there has been a significant increase in University student private rental housing development on the east side of Park Street, north of Rangeley Road. There have also been some changes in retail development in the Park Street/Rangeley Road Intersection.

The Maine Department of Transportation has plans to construct a roundabout at this same intersection with advertisement for construction anticipated to go out in December 2017 and construction complete in one year.

In November 2016, the Town of Orono placed a one-year moratorium on development in this area until a study of development impacts including traffic is studied.

The Town of Orono is preparing to hire a consultant in late 2017 to assess and analyze the Traffic System Management improvements that could be made on Park Street (Route 2) from the Orono/Old Town municipal line to College Avenue.

Transportation Improvement Projects

The BACTS Policy Committee selected 29 highway projects, including highway reconstruction, resurfacing, rehabilitation, drainage, and intersection improvements, during the 2016-2021 BACTS Transportation Improvement Programs (TIP).

The Maine DOT selects the remaining projects in the BACTS area for inclusion in the BACTS TIP. This includes projects for highway paving, maintenance, bicycle and pedestrian facilities, airports, public transportation, bridges, marine, railroad, and planning studies. Highway projects continue to dominate the BACTS transportation planning and budgeting process as well. For a complete list of all the BACTS selected 2016-2021 TIP projects, see Table B.3 in Appendix B.

Major River Crossings

The Penobscot River runs the length of the BACTS metropolitan area. It is crossed by three highway bridges between Bangor and Brewer. The bridges are the Veterans Memorial Bridge on I-395, the Joshua Chamberlain Bridge on U.S.1A/Route 9, and the Penobscot Bridge on Route 15. The twin bridges between Old Town and Milford provide a fourth highway crossing of the Penobscot, 12 miles upriver, on U.S. 2. The Stillwater River and Kenduskeag Stream are major tributaries of the Penobscot. Three highway bridges cross the Stillwater within the BACTS area, two in Old Town and one in Orono. Eleven bridges cross the Kenduskeag within the BACTS area, all located in Bangor. The Kenduskeag is channeled through the downtown area to its confluence with the Penobscot.

Performance Measures and Targets

BACTS must set highway performance measures and targets in accordance with the latest federal regulations. More information is available on subject in Chapter 12 of this Plan

5.3 Deficiencies

Lack of adequate funding

There is currently not enough funding to address all the highway needs in the BACTS area. The BACTS Policy Committee members submit construction projects for consideration of Federal and State funding for each TIP. The estimated costs of these projects is always at least two or three times the amount of available funding. This does not include the projects that the members do not submit because they know only the highest scoring projects will realistically have a chance of receiving funding. Some roadways have a higher strategic value than others do in terms of traffic volume, safety, economic benefit, and connectivity with other roads within the overall highway network. As these higher-priority projects are selected for funding, the remaining projects (including most of the collector road system) continue to deteriorate. In these cases, the municipality or state must maintain them without the 80% federal funding. The BACTS Policy Committee has recently shifted a majority of the available funding to pavement preservation projects and less on more costly reconstruction projects. More information about BACTS project funding can be found in Chapter 13.

Critical Problem Areas

The following highway segments in the BACTS region have been identified as critical problem areas, in which the current and predicted traffic volumes and land use demands already exceed the capabilities of the existing road design. If left unaddressed, these roadways could prove to be a hindrance to future

growth and development within the BACTS region. BACTS has identified the following highway segments, in no particular order of priority, as those with existing problems that will require special attention during the 2018-2038 period.

Bangor

- I-95 – I-395 Exit 182 Interchange;
- I-95 Exit 187 Interchange;
- Broadway at I-95 NB ramps and Earle Street;
- Hammond Street at I-95 ramps;
- Union Street from I-95 to Griffin Road;
- Broadway – Pushaw Road intersection;
- Maine Avenue from Griffin Avenue to Hammond Street;
- Cross-town connector roads between major inbound/outbound routes; e.g., Burleigh Road, Griffin Road;

Brewer

- WB I-395 ramps at Main Street;
- State Street - Wilson Street intersection;
- State Street - North Main Street intersection;
- South Main Street –Pendleton Street intersection;

Hampden

- Route 1A – Route 9 intersection;

Old Town/Orono

- Stillwater Avenue, Old Town – College Avenue intersection and corridor to the Orono line;
- Route 2 – intersections at Main Street and Water Street;
- Stillwater Avenue Bridges in Old Town;
- Route 16 (Bennoch Rd.) in Orono/Old Town Route 2 to Stillwater Avenue; Orono
- Park Street corridor from College Avenue to Old Town line.

Signal Conditions

Interconnecting and coordinating signal systems aid in the continuous moving of vehicular traffic on the roadways by implementing a traffic-responsive operation. This reduces delays and congestion during both peak and non-peak travel periods. BACTS continually studies and implements projects to interconnect and coordinate corridors within the region. BACTS will continue to monitor Connected and Autonomous Vehicle technology as it becomes more tested in other areas.

The Policy Committee will continue to approve traffic signal improvement projects that were recommended in various studies.

5.4 Future Conditions and Issues

If the BACTS region grows in population and commercial development increases along our roadways, the demand on our current highway network will also increase. Congestion will become an issue and acceptable condition of our roadways will become increasingly costly to maintain. A review of past growth from 2003 to 2014 indicated that volume of traffic was decreased or remained level except for a few local corridors

The decreases occurred during an economic recession and increased fuel costs. As the economy improves and fuel prices remain relatively steady, we can expect a slight increase in volumes. BACTS will continue to monitor traffic volumes to analyze any significant trends.

5.5 Recommendations

The BACTS Policy Committee has identified several strategies to improve the highway network in the BACTS area as listed below.

Performance Measures and Targets:

- Work with the Maine DOT to produce highway performance measures and set targets.

Traffic Volume:

- Advocate for the recommended improvements to the I-95 corridor in the 2011 I-95 study and continue to monitor and advocate for improvements for the traffic operations at ramp intersections with area arterials.
- Continue to review and provide input on the design and reconstruction of the Stillwater Avenue improvements from the Orono/Old Town line to and including the College Avenue intersection. The success on the reconstruction of the Stillwater Bridge projects in this corridor is contingent on the successful design and construction on both approaches, especially the College Avenue intersection.
- Study intersections listed in the Critical Problem Areas section of this Chapter.
- Continue to review and provide input on the design and improvements to Route 1A in Hampden southerly to Route 9.
- Continue to review and provide input on the design and construction of the proposed Diverging Diamond Interchange at Exit 187 at Hogan Road in Bangor.
- BACTS should hire a consultant to produce a "Road Pavement Analysis and Recommended Action Plan" that will include an inspection of the BACTS road system network and collecting pavement-related data.
- Implement recommendations outlined in completed corridor studies as funds become available and as appropriate.
- Work to improve cross-town connector roads between major inbound/outbound routes in Bangor such as Burleigh Road and Griffin Road.
- Promote and invest in alternative transportation methods like car-pooling, park and ride lots and bicycle and pedestrian facilities.

Traffic Signals:

- BACTS should continue to study signal coordination, phasing/timings along all major corridors in the region.
- Continue to provide input and monitor the findings of the Maine DOT Traffic Mobility Working Group.
- BACTS should update the signal equipment inventory, review standardization of this equipment and work with the Maine DOT and municipalities to implement a maintenance plan for all signals within the region.
- BACTS should continue to monitor technology improvements that could be implemented in the BACTS area.