



# **INTERIM BACTS LONG RANGE TRANSPORTATION PLAN 2011-2038**

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## Executive Summary

### Introduction

The Bangor Area Comprehensive Transportation System (BACTS) was designated in 1982 as the Metropolitan Planning Organization (MPO) responsible for coordinated transportation planning in the urbanized areas of the greater Bangor area.

The municipalities currently served by BACTS are Bangor, Brewer, Veazie, Indian Island and portions of Hampden, Orono, Old Town, Milford, Bradley, Eddington, and Orrington. Approximately 59,000 people live in the BACTS metropolitan area, making it the third largest urban center in the State of Maine.

The greater Bangor area is a major service center and commercial hub for Maine and the maritime provinces of Canada. Bangor International Airport (BGR) serves as an international gateway, refueling stop, and alternate landing area for many commercial and military flights, including the space shuttle. The main campus of the University of Maine, located in Orono, enriches the surrounding communities by providing quality academic programs and numerous cultural and sporting events.

This document contains the region's goals, policies, existing conditions, existing and future deficiencies, and recommendations. The plan also serves as a preliminary tool for transportation planning in the greater Bangor area. The planning process utilized to develop this document follows the general guidelines and procedures of the federal "Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users", (SAFETEA-LU) legislation and the Maine Sensible Transportation Policy Act (MSTPA).

### Goals:

This plan was developed using the eight metropolitan planning factors outlined in SAFETEA-LU listed below:

1. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency;
2. Increase the safety of the transportation system for motorized and non-motorized users;
3. Increase the security of the transportation system for motorized and non-motorized users;
4. Increase the accessibility and mobility of people and for freight.
5. Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
6. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
7. Promote efficient system management and operation.
8. Emphasize the preservation of the existing transportation system.

The BACTS Policy Committee developed a mission statement and six regional goals listed below:

**Mission Statement:** Provide for the safe, economical, efficient, and convenient movement of people and goods over a balanced multimodal transportation system compatible with the socio-economic and environmental characteristics of the region.

**BACTS Regional Goals:** Below are six transportation goals created by BACTS followed by supportive regional priorities as adopted by the BACTS Policy Committee. The goals are listed in no particular order of importance.

- 3.4.1 *Fiscal Responsibility* - Planning and programming within our means, focusing on the greatest needs and getting the greatest returns by targeting regional needs, leveraging partnerships, and sharing investment burdens appropriately.
- 3.4.2 *Economic Prosperity and Livability* – Promote transportation investments that support sustainable community and economic development.
- 3.4.3 *Safety and Security* – Ensure that BACTS has an ongoing process to improve the safety and security of our transportation system in the BACTS area.
- 3.4.4 *Public-Private Partnership and Coordination* - Local, state and federal stakeholders should be involved in partnerships to promote cost-effective decision-making: land use and transportation connections, coordinated capital investments, and joint purchasing, etc.
- 3.4.5 *Environmental Stewardship* - Ensure that the transportation system meets the social, cultural, historic, scenic and environmental needs of the public.
- 3.4.6 *Customer Oriented Focus* - Inclusive, balanced, early and effective public involvement that considers not only if projects should be done, but how.

### Demographics

Employment and population in the BACTS region is expected to grow very slowly. However, most of the increase in population will be within the MSA outside the BACTS municipalities, and most of the increase in employment will be within BACTS municipalities. This imbalance will accentuate the current trend of increasing numbers of vehicular trips originating outside the urban area. This trend will have the most impact on radial routes serving the urban area.

The very low level of expected growth is not likely to cause any significant systemic congestion problems. Localized traffic impacts resulting from individual commercial developments will exceed any additional traffic generated by forecasted population and employment growth over the next 20 years.

The out-migration of the population from the urban areas into their surrounding suburbs is a pattern that has been repeated all over the nation. Though in each urban area there may be particular reasons for the phenomenon, it reflects a widespread desire for a more rural lifestyle, without discarding the benefits of urban opportunities.

However, in the period 2000 through 2010, the US Census indicates a different trend. The population in the entire MSA increased by 10,748, while the population in the urban towns and cities increased by 4,946. Several individual municipalities within the MSA more distant from the Bangor urbanized area lost population, while all individual municipalities located close to the urban core gained population, including most of the municipalities within the urbanized area. The overall effect was to concentrate population more strongly in and immediately around the urban area.

The 2030 forecasts of population in the individual municipalities show the trend of the first decade of the 21<sup>st</sup> Century continuing with net increases in population in both the urban and rural areas. However, the rate of increase is expected to be much smaller.

### Transit

The fixed route transit in the BACTS area is provided by BAT Community Connector which is operated by the City of Bangor. BAT provides service to Bangor, Brewer, Hampden, Old Town, Orono, the University of Maine (Orono) and Veazie. The system operates approximately 588,400 vehicle miles per year and covers 104 miles of roadway

The basic hours of operation are 6:15 a.m. to 6:15 p.m. Bus service runs six days per week (Monday through Saturday) in all areas, except Hampden, where service is available five days per week (Monday through Friday). BAT operates a “pulse system” designed to facilitate the transfer of riders on one route to another. A pulse system requires buses from all routes operating out of Pickering Square in downtown Bangor to meet at Pickering Square at the same time, so those passengers transferring from route to route do not have to wait too long to board the connecting bus.

Ridership on the BAT has increased substantially since BACTS commissioned a *Transit Route Redesign Study in the BACTS Area* by Tom Crikelair Associates in 2002. Several changes in routes were made, the fare structure was revised, new schedules designed, and a revamped vehicle livery was adopted as a result. The improvements along with volatile gas prices caused ridership to increase on the BAT approximately 50 percent in six years from nearly 600,000 rides in 2004 to nearly 900,000 rides in 2010.

### Highway Network

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 179 miles of collector and arterial roadways.

Since 2004, there has been no new alignment construction using federal or state funding in the BACTS region. There is only one new potential construction project known at this time; the connection of Route 9 to I-395 through a corridor across Brewer, Holden and Eddington. The recently completed I-95 Study recommended future study of impacts for new ramps and interchanges.

The majority of arterials with an increase in traffic volumes have been on those coming into the urban core from the suburban areas such as Union Street and Route 2 in Bangor, Western Avenue in Hampden and in the retail areas such as Stillwater Avenue.

The BACTS area has 135 traffic signals in operation, as of December 2010, 29 of which were flashing-light only. The vast majority of the signals are actuated by vehicles approaching the intersection, although a few timed-cycle signals are still in operation.

According to the 2006-2008 MaineDOT Crash Report, there were 89 high-crash locations on roads in seven of ten BACTS municipalities: 57 in Bangor, 12 in Brewer, 5 in Old Town, 11 in Orono, 2 in Hampden, and 1 in Eddington and 1 in Orrington. These figures may include local roads and rural areas of the municipalities, which are not part of the BACTS highway inventory.

#### Bicycle/Pedestrian

U.S. Census 2000 data indicated that on average, 6 percent of all residents in the BACTS region either bicycled or walked to work, compared to 7 percent in 1990.

Within BACTS, Orono had the highest percentage of human-powered commuters in 2000 at 24 percent. Orono, in fact, has the second highest percentage in the whole state of Maine, next to Bar Harbor. Between 5 percent and 10 percent of residents from the Penobscot Indian Nation, Old Town, and Bangor either walked or bicycled to work, while the remaining BACTS communities reported less than 5 percent using non-motorized transportation modes.

The BACTS 2005 Bicycle and Pedestrian Plan included an analysis of crash report data from 1994 to 1999 to better determine the circumstances surrounding bicycle and pedestrian crashes in the BACTS area. For that time period, there were 129 reported highway crashes involving pedestrians and 95 crashes involving bicycles in greater Bangor. According to MaineDOT, there were 101 bicycle related crashes including 1 fatality and 168 pedestrian related crashes including 12 fatalities in Penobscot County between 2004 and 2009.

#### Air Transportation

In the BACTS region, commercial passenger service is available through Bangor International Airport (BGR), while general aviation service is available at both BGR and DeWitt Field in Old Town. BGR flew 388,681 passengers (enplanements/ deplanements) in 2009.

### Rail Transportation:

Two rail systems, Pan AM and Montreal, Maine, and Atlantic (MMA), operate in the BACTS areas and provide freight rail connections to Canada and the remainder of the United States.

Total tonnage of goods hauled by Maine's railroads continues to decline, as is the case nationally.

There are no passenger rail facilities located in or serving the BACTS area.

### Marine Transportation

The importance of the River to the economy of the region has declined in recent years as the movement of fuel, raw materials and products have moved away from Maine's coast and inland rivers to trucks, rail lines, and pipelines. There is no passenger marine service and minimal commercial marine transportation in the corridor other than occasional asphalt and petroleum barge shipments. However, new manufacturing opportunities have arisen in Brewer that may return the Penobscot River to its status as a vital transportation asset linking eastern Maine communities to world markets.

### Financial Issues:

MaineDOT's long range plan, "Connecting Maine: Maine's Long Range Transportation Plan" states, "*Construction-cost inflation and significant increases in energy costs have also reduced the purchasing power of the motor-fuels tax. The cost of construction materials has significantly outpaced the rate of consumer inflation, due to increased asphalt and fuel costs plus worldwide demand for construction materials.*" MaineDOT's long range plan goes on to say "*As alternative fuels and more efficient vehicles come into greater use, motor-fuel tax revenues will be a less viable option to support transportation improvements. While these changes create cost savings for motorists and benefit the environment by reducing greenhouse gas emissions, they also create reduced revenues needed for transportation financing.*"

The amount of funding allocated by MaineDOT to BACTS over the past eight years is about 35 percent of the amount for projects submitted by the municipalities for consideration. The municipal list of essential projects would be much greater if more funding were available. The municipalities submit only those projects that are most in need of repair and that have a chance of rating high enough for possible selection for funding. Projects that go unfunded either: 1) continue to deteriorate further, resulting in even higher reconstruction costs; or 2) force municipalities to pay 100 percent of reconstruction costs instead of typical local match amounts (0 to 15 percent) needed for state and federally funded projects. The process of prioritizing important projects becomes increasingly difficult with flat or declining funding levels. This trend is not likely to change and future earmark projects are unlikely.

## Climate Change, Livability, Sustainability and Transportation Operations

There will be a strong trend in Maine toward warmer and generally wetter conditions in all four seasons over the 21st century with the exception of summer precipitation. Projected increases in both temperature and precipitation tend to be greatest in the north, and least along the coast. These warming trends imply a significant shift in the regional hydrology, from a snowmelt-dominated regime to one that shows significant runoff during winter. This shift, coupled with projected precipitation increases in winter, will likely pose challenges for flood mitigation.

Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safe streets. Sustainable transportation provides exceptional mobility and access to meet development needs without compromising the quality of life of future generations. Livability and Sustainability can be addressed together since a strategy for pursuing one will often be appropriate for the other.

BACTS promotes the development of transportation options that support Livability and Sustainability by including non-automobile modes in its evaluation of potential highway projects for the BACTS Transportation Improvement Program (TIP). Through the TIP project evaluation criteria and project scoring, projects that support alternative modes and their integration into the transportation system, score higher and so are more likely to be funded.

BACTS has developed some transportation system management and operations strategies in the planning process designed to optimize the performance of the transportation system. They allow for a more immediate response to traveler concerns than capacity projects offer while improving the reliability, security, and safety of the multimodal transportation system.



## **1.0 Introduction**

### **1.1 Statement of Purpose**

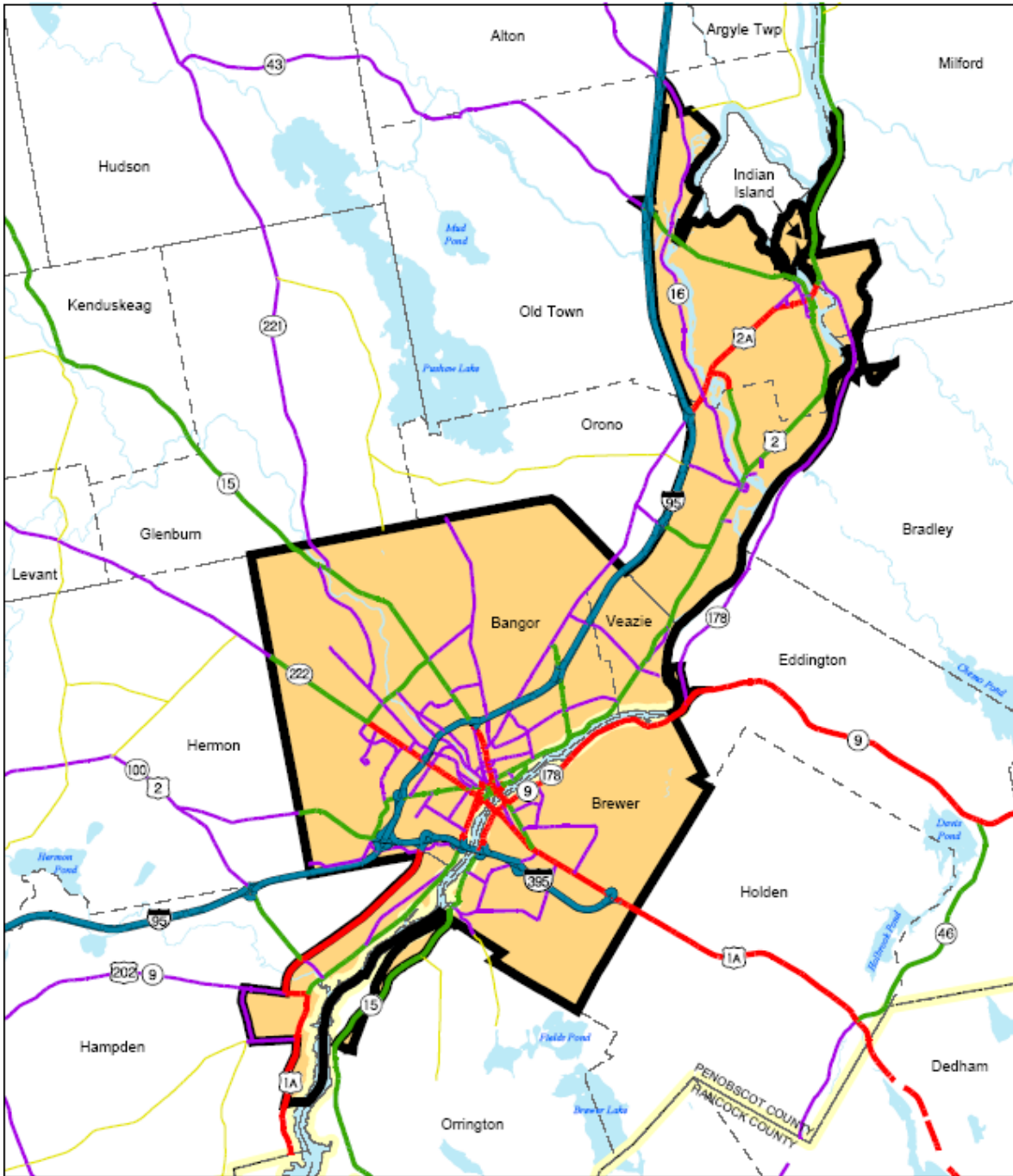
The Bangor Area Comprehensive Transportation System (BACTS) was designated in 1982 as the Metropolitan Planning Organization (MPO) responsible for coordinated transportation planning in the urbanized area surrounding Bangor. The municipalities currently served by BACTS include Bangor, Brewer, Veazie, Indian Island and portions of Hampden, Orono, Old Town, Milford, Bradley, Eddington, and Orrington. Approximately 59,000 people live in the BACTS metropolitan area, making it the third largest urban center in the state of Maine. The flagship campus of the University of Maine in Orono (UMO) enriches the surrounding communities by providing quality academic programs and numerous cultural and sporting events. Greater Bangor also serves as a major business and commercial hub for Maine and the maritime provinces of Canada. Bangor International Airport (BGR) serves as an international gateway, refueling stop, and alternate landing area for many commercial and military flights, including the space shuttle. The geographic boundaries of the MPO are shown in Figure 1 below.

The Policy Committee governs BACTS. This committee is comprised of sixteen municipal officials, a Maine Department of Transportation (MaineDOT) representative, and the Eastern Maine Development Corporation (EMDC) president. There are also four non-voting members, representing the Bangor Region Chamber of Commerce, the Comprehensive Economic Development Strategy (CEDS) transportation subcommittee, the Federal Highway Administration (FHWA), and the Federal Transit Administration (FTA). The Policy Committee meets regularly to establish transportation priorities and to allocate specific categories of federal funds to meet the area's transportation needs.

Advising the Policy Committee is a Technical Committee, comprised of state and municipal engineers, planners and officials. This committee scopes, reviews, and recommends biennial Transportation Improvement Program (TIP) projects to be included in the State's TIP; and reviews consultant proposals to perform major transportation studies and traffic analyses within the BACTS area and recommends to the Policy Committee which Consultant should perform this study.

In order to receive Federal funding for transportation projects in the urbanized area, BACTS is required to produce a broad-based, long-range, multimodal transportation plan addressing the needs of its constituency. To meet this mandate, BACTS prepares and presents an updated long-range plan every five years. This plan represents several iterations of input and feedback from our primary users -- the traveling public within the urbanized area, as defined by the Technical Committee to determine the present and future transportation needs of the region.

Figure 1: BACTS Metropolitan Area



This plan is intended to serve as a guide for coordinated decision-making and long-term planning and investment in transportation projects at the municipal, regional, and state levels.

BACTS has considered all locally available modes of transportation in compiling this plan, including the existing and future highway system, railroads, air travel, marine transport, public transit, bicycle and pedestrian travel, and methods for improving intermodal connections for passengers and freight. The plan also considers less quantifiable aspects of transportation planning, such as the potential for future business development and tourism in the Bangor region and quality-of-life concerns for area residents. Elements of the plan include an inventory of the current BACTS transportation system, a listing of current and future problems that will need to be addressed, and a discussion of strategies to alleviate or eliminate these problems and achieve the stated goals and objectives by the year 2035.

## 1.2 Overview of the Long-Range Transportation Plan

The BACTS plan for the next two decades focuses on maintaining existing infrastructure, increasing intermodal connectivity and making the Bangor region a more attractive and convenient place to live, work, shop, and play. Good transportation planning does not occur in a vacuum; many of the long-range goals focus on coordinating local and regional transportation initiatives with land planning, access management, and environmental protection, to permit economic growth without sacrificing the high quality of life, which residents and visitors to the Bangor area currently enjoy.

Chapter 2 describes the existing conditions of the transportation system in the metropolitan area, with an analysis of land-use patterns, socioeconomic conditions, and commuting patterns as well as a status report on each existing mode in the transportation network. Chapter 3 presents the BACTS mission statement, SAFETEA-LU and BACTS goals and miscellaneous policy issues. Chapters 4 through 9 address the existing conditions and trends, deficiencies, and recommendations for individual modes. These chapters describe the BACTS vision for the year 2035 and what it will take to get there. Chapter 10 details the financial details including issues and constraints. Chapter 11 is a new chapter focusing on climate change, livability, sustainability and transportation operations; all interwoven issues important to the region and required by FHWA. The recommendations and strategies determined for this plan are written at the end of these chapters and combined in Chapter 12.

Appendix A contains a schedule of public involvement for this Long Range Plan and the compilation of public comments on the plan, with a specific response to each, if warranted. Appendix B contains classifications of all BACTS arterials and collectors, traffic volumes, and an historic list of BACTS Transportation Improvement Projects. Appendix C is a list of transportation studies conducted since the last Long Range Plan. Appendix D is acronyms used in transportation planning while Appendix E contains definitions used in transportation planning.

### 1.3 Legislative Mandates

All transportation initiatives undertaken by BACTS must adhere to standards specified in existing federal and state legislation. In addition to the SAFETEA-LU investment goals listed in Chapter 3, the BACTS planning process is subject to the prescriptions of the Maine Sensible Transportation Policy Act (MSTPA), the Clean Air Act Amendment (CAA), the National Environmental Policy Act (NEPA), the Americans with Disabilities Act (ADA), and Title VI of the Civil Rights Act.

### 1.4 Public Participation Process

SAFETEA-LU and MSTPA require each MPO to develop a public involvement process for the development and implementation of its transportation planning initiatives. Title VI of the Civil Rights Act requires a means of ensuring that transportation projects are not selected on the basis of discriminatory practices. Informed public review and feedback help to ensure that the proposed transportation alternatives truly meet the needs of the local community. It is particularly critical to get the opinions of users whose concerns may otherwise be overlooked in the transportation planning process, including low-income residents and workers, disabled individuals, the elderly, bicyclists, and pedestrians.

In order to maximize public input to the long-range plan, BACTS staff members solicit public feedback in structured and well-publicized meetings and focus groups, as well as through informal face-to-face visits, written commentary, the BACTS website, e-mail, and telephone conversations. An extensive computerized database is used to continually expand the contact list of interested and affected parties and special interest groups for working advisory committees and informational mailings. A schedule of public involvement for this Long Range Plan is included in Appendix A. A copy of the BACTS public participation document, detailing methods and timelines for soliciting public participation for transportation planning and decision-making may be found on the BACTS website at: [www.bactsmmpo.org](http://www.bactsmmpo.org). This plan was last reviewed and updated in 2010.

## **2.0 Demographics**

### **2.1 Introduction**

Regional travel demand is closely related to the region's population size, characteristics, and employment. Travel demand is the combined effect of the need to make trips to satisfy personal, household, commercial, and community needs. A region containing a large population generates more trips than one containing a small population. Households having more vehicles available make more trips than those having fewer vehicles. Similarly, households having more members employed make more trips than households having fewer members employed. There are many other factors that can be used to forecast the trip making potential of a region. This chapter looks at a few of these; at the time of writing, complete Census 2010 data was not yet available.

### **2.2 Population**

Population trends of the 1990s suggest that people moved from the densely populated BACTS urban core to the suburbs. The Greater Bangor Metropolitan Statistical Area (MSA), using the boundary established according to the 2000 Census, gained 2,983 persons between 1990 and 2000, while the urban communities lost 2,352 people, i.e. the rural part of the MSA gained 5,335 people. Hampden was the only BACTS community to experience any significant population increase, perhaps because most of Hampden is outside of the BACTS urban boundary. Holden was the only suburban town to lose population.

The out- migration of the population from the urban areas into their surrounding suburbs is a pattern that has been repeated all over the nation. Though in each urban area there may be particular reasons for the phenomenon, it reflects a widespread desire for a more rural lifestyle, without discarding the benefits of urban opportunities.

However, in the period 2000 through 2010 (see Table 2.1), the Census Bureau's counts indicate a different trend. The population in the entire MSA increased by 10,748, while the population in the urban towns and cities increased by 4,946. Several individual municipalities within the MSA more distant from the Bangor urbanized area lost population, while all individual municipalities located close to the urban core gained population, including most of the municipalities within the urbanized area. The overall effect was to concentrate population more strongly in and immediately around the urban area.

The 2030 forecasts of population in the individual municipalities show the trend of the first decade of the 21<sup>st</sup> Century continuing with net increases in population in both the urban and rural areas. However, the rate of increase is expected to be much smaller.

**Table 2.1 Populations of Greater Bangor Metropolitan Statistical Area Cities and Towns**

Municipality	2000 Population		2010 Population		2030 Forecast	
<b>BACTS</b>						
Bangor	31,473		33,039		32,286	
Bradley	1,242		1,492		1,867	
Brewer	8,951		9,482		9,452	
Eddington	2,030		2,225		2,378	
Hampden	6,327		7,257		8,428	
Milford	2,952		3,070		2,937	
Old Town	8,133		7,840		6,146	
Orono	9,112		10,362		11,856	
Orrington	3,560		3,733		3,639	
PIN	559		610		646	
Veazie	1,744		1,919		2,067	
<b>Total</b>	<b>76,083</b>		<b>81,029</b>		<b>81,703</b>	
<b>Other Greater Bangor MSA</b>						
Alton	816		890		942	
Amherst	230		265		310	
Argyle	253		277		295	
Aurora	121		114		83	
Bradford	1,186		1,290		1,358	
Carmel	2,416		2,794		3,290	
Charleston	1,397		1,409		1,252	
Clifton	743		921		1,206	
Corinth	2,511		2,878		3,338	
Dedham	1,422		1,681		2,052	
Dixmont	1,065		1,181		1,291	
EC Penobscot	324		343		341	
Edinburg	98		131		189	
Enfield	1,616		1,107		1,376	
Etna	1,012		1,246		1,617	
Exeter	997		1,092		1,166	
Frankfort	1,041		1,124		1,166	
Garland	990		1,105		1,223	
Glenburn	3,964		4,594		5,429	
Greenbush	1,421		1,491		1,455	
Hermon	4,437		5,416		6,940	
Holden	2,827		3,076		3,241	
Howland	1,362		1,241		803	
Hudson	1,393		1,536		1,661	
Kenduskeag	1,171		1,348		1,575	
Lagrange	747		708		526	
Levant	2,171		2,851		4,029	
Lowell	291		358		464	
Maxfield	87		97		107	
Newburg	1,394		1,551		1,706	
Newport	3,017		3,275		3,435	
Passadumkeag	441		374		172	
Plymouth	1,257		1,380		1,480	
Stetson	981		1,202		1,549	
Winterport	3,602		3,757		3,619	
<b>Total</b>	<b>48,801</b>		<b>54,603</b>		<b>60,687</b>	
<b>Total Greater Bangor MSA</b>	<b>124,884</b>		<b>135,632</b>		<b>142,390</b>	

## 2.3 Employment

The employment market in the Greater Bangor MSA is a reflection of the major role that the Bangor area has adopted as the major service center for eastern and central Maine. The market is expected to continue to focus on services as shown below in Table 2.2

**Table 2.2 Employment Categories within the Greater Bangor MSA**

NAICS Code	Industry	BACTS Towns	Balance of MSA	Total	BACTS Towns	Balance of MSA	Total
		2009	2009	2009	2030	2030	2030
101	Goods-Producing Domain	5,078	1,446	6,524	4195	1197	5392
1011	* Natural Resources and Mining	141	288	429	98	200	297
1012	* Construction	2,104	674	2,778	1988	637	2625
1013	* Manufacturing	2,833	484	3,317	2109	360	2469
102	Service-Providing Domain	49,495	6,525	56,020	61295	7857	69152
1021	* Trade, Transportation and Utilities	12,883	2,452	15,335	13938	2653	16591
1022	* Information	1,122	16	1,138	976	14	990
1023	* Financial Activities	2,097	176	2,273	2282	192	2474
1024	* Professional and Business Services	5,305	508	5,813	5874	563	6437
1025	* Education and Health Services	19,104	1,990	21,094	28188	2936	31124
1026	* Leisure and Hospitality	5,375	525	5,900	6221	608	6829
1027	* Other Services	1,529	239	1,768	1723	269	1992
1028	* Public Administration	2,080	619	2,699	2092	623	2715
	Total	54,573	7,971	62,544	65,490	9,053	74,543

**NAICS Code:** The North American Industry Classification System (NAICS) is the standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy.

The forecasts are based on the growth factors for each employment sector derived from a regional econometric model maintained by the University of Southern Maine. The growth factors are applied to each municipality's distribution of employment between employment sectors. The 2009 employment and the 2030 employment forecasts for each municipality within the Greater Bangor MSA are shown below in Table 2.3.

**Table 2.3 – Total Employment in Greater Bangor MSA**

<b>Municipality</b>	<b>2009 Employment</b>		<b>2030 Forecast</b>	
<b>BACTS Towns</b>				
Bangor	36,019		43,655	
Bradley	122		128	
Brewer	6,303		6,926	
Eddington	308		378	
Hampden	1,923		2,175	
Milford	316		360	
Old Town	2,926		3,095	
Orono	5,743		7,713	
Orrington	388		441	
PIN	190		265	
Veazie	333		354	
<b>Total</b>	<b>54,571</b>		<b>65,490</b>	
<b>Other Towns in MSA</b>				
Alton	76		90	
Amherst	11		12	
Argyle		*		*
Aurora	37		38	
Bradford	77		71	
Carmel	243		288	
Charleston	283		368	
Clifton	22		23	
Corinth	512		604	
Dedham	139		164	
Dixmont	52		54	
EC Penobscot		*		*
Edinburg		*		*
Enfield	260		277	
Etna	130		135	
Exeter	87		77	
Frankfort	65		68	
Garland	56		57	
Glenburn	263		316	
Greenbush	123		130	
Hermon	1,923		2,115	
Holden	451		523	
Howland	260		337	
Hudson	70		72	
Kenduskeag	93		99	
Lagrange	20		21	
Levant	180		197	
Lowell	13		13	
Maxfield		*		*
Newburg	90		94	
Newport	1,709		1,969	
Passadumkeag	17		12	
Plymouth	145		152	
Stetson	99		98	
Winterport	440		554	
<b>Total</b>	<b>7,973</b>		<b>9,053</b>	
<b>Total MSA</b>	<b>62,544</b>		<b>74,543</b>	

\*employment data suppressed



The population and employment, and their expected growth rates are summarized and compared in the following Table 2.4.

**Table 2.4 Population and Employment Growth Rates**

<b>Population</b>	<b>2010</b>	<b>2030</b>	<b>Annual % growth rate</b>
BACTS Towns	81,029	81,703	0.04
Other MSA	54,603	60,687	0.53
Total MSA	135,632	142390	0.24
<b>Employment</b>	<b>2009</b>	<b>2030</b>	
BACTS Towns	54573	65490	0.87
Other MSA	7971	9053	0.61
Total MSA	62544	74543	0.84

Population and Employment Issues

Both employment and population in the BACTS region are expected to grow very slowly. However, most of the increase in population will be within the MSA outside the BACTS municipalities, and most of the increase in employment will be within BACTS municipalities. This imbalance will accentuate the current trend of increasing numbers of vehicular trips originating outside the urban area. This trend will have the most impact on radial routes serving the urban area.

The very low level of expected growth is not likely to cause any significant systemic congestion problems. Localized traffic impacts resulting from individual commercial developments will exceed any additional traffic generated by forecasted population and employment growth over the next 20 years.

### **3.0 Mission Statement, Goals, and Policy Issues**

#### **3.1 Introduction**

BACTS has developed a mission statement, specific goals, and priorities for the greater Bangor metropolitan area that is consistent with the SAFETEA-LU goals. The BACTS Mission Statement is listed first, followed by the SAFETEA-LU goals and the BACTS Transportation Goals and Priorities.

Non-modal policy issues are addressed at the end of this chapter and include a discussion on regional coordination in transportation and land use planning and BACTS committee membership requirements mandated by SAFETEA-LU.

#### **3.2 BACTS Mission Statement**

Provide for the safe, economical, efficient, and convenient movement of people and goods over a balanced multimodal transportation system compatible with the socio-economic and environmental characteristics of the region.

#### **3.3 SAFETEA-LU Goals**

The BACTS long-range plan addresses each of the SAFETEA-LU comprehensive goals and identifies strategies to achieve them, within the context of the existing infrastructure and future plans for the Bangor area. The SAFETEA-LU mandated goals are listed below:

- Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity and efficiency.
- Increase the safety of the transportation system for motorized and non-motorized users.
- Increase the security of the transportation system for motorized and non-motorized users.
- Increase the accessibility and mobility of people and for freight.
- Protect and enhance the environment, promote energy conservation, improve quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns.
- Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight.
- Promote efficient system management and operation.
- Emphasize the preservation of the existing transportation system.

#### **3.4 BACTS Transportation Goals and Priorities**

There are six transportation goals created by BACTS in no particular order followed by supportive regional priorities as adopted by the BACTS Policy Committee.

3.4.7 **Fiscal Responsibility** - *Planning and programming within our means, focusing on the greatest needs and getting the greatest returns by targeting regional needs, leveraging partnerships, and sharing investment burdens appropriately.*

BACTS priorities that support this goal:

- Seek increased funding for construction projects in the urbanized areas.
- Support the protection and integrity of Maine's Highway Fund.
- Optimize capacity to the existing system before increasing capacity through road building activities
- Investigate ways to leverage federal funds using an equitable mix of state and local funds.
- Develop and implement a regional transportation process that produces cost savings through regionalization.
- Seek innovative techniques for transportation projects to extend project life.

3.4.8 **Economic Prosperity and Livability** – *Promote transportation investments that support sustainable community and economic development.*

BACTS priorities that support this goal:

- Restore passenger rail transportation with intermodal connections in the Bangor area.
- Consider shoulder paving on all highway projects.
- Strengthen intermodal links between the Bangor area and Portland, Boston, Greenville, Millinocket, and the Trenton area.
- Consider paving priorities on roadways identified in the BACTS Bicycle/Pedestrian Plan.
- Incorporate bike/pedestrian facilities on existing or potential high-use roadway crossings of interstates and rivers.
- Seek to allocate funds for providing transit service from suburban areas into and between service centers.
- Give high priority to projects that provide for connections between modes.
- Provide for the efficient movement of goods.
- Target access to key economic sites.
- Provide better/improved access to housing, employment, services, and major recreational facilities.
- Plan for streetscaping.

3.4.9 **Safety and Security** – *Ensure that BACTS has an ongoing process to improve the safety and security of our transportation system in the BACTS area.*

BACTS priorities that support this goal:

- Pursue changing interstate weight limits to be consistent with Maine state highway weight limits.
- Work with safety and security agencies to develop a safer and more secure transportation system.
- Give high priority to the elimination of safety hazards in all modes.
- Evaluate the movement of hazardous materials on all transportation modes and encourage the use of safer modes.

3.4.10 **Public-Private Partnership and Coordination** - *Local, state and federal stakeholders should be involved in partnerships to promote cost-effective decision-making; land use and transportation connections, coordinated capital investments, and joint purchasing, etc.*

BACTS priorities that support this goal:

- Assist towns in their access management efforts.
- Seek to integrate access management, corridor planning, and broad-based transportation considerations in their comprehensive planning process.
- Encourage communities to consider land use practices, policies and standards that reduce vehicle miles of travel.
- Restore and increase freight rail transportation in the Bangor area.
- Facilitate the establishment of passenger rail or bus transfer points in established downtown areas wherever feasible.
- Improve communication and coordination between BACTS and MaineDOT on project scoping and prioritization
- Assist in developing and providing more expertise in land-use planning as is related to transportation.

3.4.11 **Environmental Stewardship** - *Ensure that the transportation system meets the social, cultural, historic, scenic and environmental needs of the public.*

- Support projects that result in reduced vehicle emissions and other impacts such as noise.
- Reduce adverse impacts on wetlands, critical habitat, water bodies and other environmentally sensitive areas.
- Support projects that promote resource efficiency and energy conservation.

- Concentrate mitigation for regional projects in areas of high environmental significance.

3.4.12 **Customer Oriented Focus** - *Inclusive, balanced, early and effective public involvement that considers, not only if projects should be done, but how.*

BACTS priorities that support this goal:

- Continue to include citizens, and open citizen participation, in the transportation planning process.
- Increase the membership of the MPO committees to include mode representatives and/or major stakeholders.
- Promote communication with public on BACTS activities.

## 4.0 Public Transportation

### 4.1 Introduction

Public transportation forms a key component of the region's transportation system. While most travel in the BACTS area is accomplished by automobile, there is a significant and growing segment of the population that relies on public transportation to fulfill its needs. In addition, visitors who have traveled to the region by non-automobile modes need public transportation to travel in the area during their visit. Public transportation is provided by a mixture of for-profit and non-profit organizations, supplying intercity, fixed route urban, fixed route rural, and demand response services.

### 4.2 Existing Conditions

#### 4.2.1 Fixed Route Transit

The fixed route transit in the BACTS area is provided by BAT Community Connector, operated by the City of Bangor. BAT provides service to Bangor, Brewer, Hampden, Old Town, Orono, the University of Maine (Orono) and Veazie. The system operates approximately 588,400 vehicle miles per year and covers 104 miles of roadway

The basic hours of operation are 6:15 a.m. to 6:15 p.m. Bus service runs six days per week (Monday through Saturday) in all areas, except Hampden, where service is available five days per week (Monday through Friday). BAT operates a "pulse system" designed to facilitate the transfer of riders on one route to another. A pulse system requires buses from all routes operating out of Pickering Square in downtown Bangor to meet at Pickering Square at the same time, so those passengers transferring from route to route do not have to wait too long to board the connecting bus.

##### 4.2.1.1 Routes

The BAT route structure, prior to 2003, is described below.

- 1.) The *Hammond Street Route* serves the Union Street-Hammond Street area by a one-way loop via Union Street, Vermont Avenue, Maine Avenue, Texas Avenue, Hammond Street, West Broadway, Buck Street, 3<sup>rd</sup> Street, Cedar Street, and Main Street. The service is provided by a single bus operating on 30 minute headways on weekdays and 60-minute headways on Saturdays.
- 2.) The *Capehart Route* serves the Ohio Street-Union Street Corridor, including Bangor International Airport and the Capehart housing complexes via Ohio Street and Union Street. The service is provided by two buses, giving 30-minute headways on weekdays and Saturdays.
- 3.) The *Center Street Route* serves the Center Street Corridor and the Husson College area, via Center Street, Broadway, and Kenduskeag Avenue. The service is

provided by a single bus operating on 30-minute headways on weekdays and 60-minute headways on Saturdays.

- 4.) The *Mount Hope Route* serves the area of Mount Hope Avenue, Hogan Road, the Bangor Mall, Stillwater Avenue, and Broadway, by a one-way loop. The service is provided by two buses, giving 30-minute headways on weekdays and Saturdays.
- 5.) The *Brewer Route* serves the more urbanized areas of the City of Brewer, by two one-way loops; one for south Brewer, via South Main Street, Parkway South, and Wilson Street; and one for north Brewer, via North Main Street, Parkway North, and State Street. The service is provided by a single bus serving the loops alternately on 60-minute headways on weekdays and Saturdays.
- 6.) The *VOOT (Veazie, Orono, Old Town) Route* serves the U.S. Route 2 corridor to Orono, and the US Route 2/ Stillwater Avenue/ College Avenue loop through Old Town and Orono. The service is provided by two buses on 60-minute headways on weekdays and by a single bus on 2-hour headways on Saturdays.
- 7.) The *Hampden Route* serves the US Route 1A corridor from Bangor to Hampden. The route is served by a single bus operating on 60-minute headways on weekdays. There is no service between 10 a.m. and 2:15 p.m. on weekdays. There is no service on Saturdays.

BAT reconfigured some routes in 2003, while other routes were added. Route changes are described below.

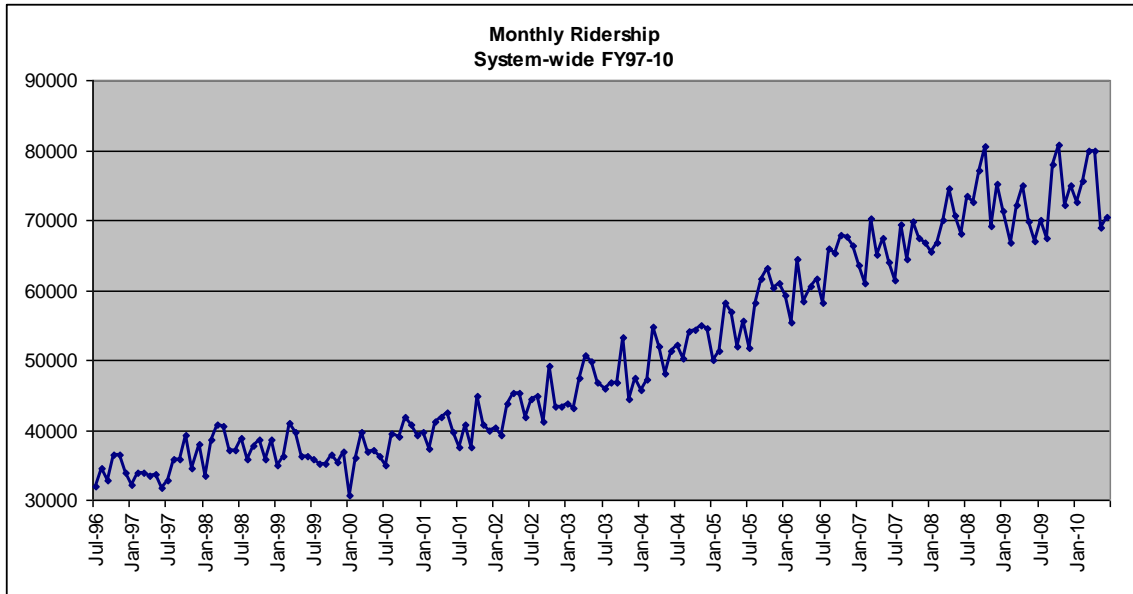
- 1.) In June 2003, a bus was added to the Brewer route, allowing 2-way service to be provided on the north loop and south loop separately. In addition, service was extended, on both loops, to outer Wilson Street to serve an emerging commercial and retail area, anchored by a Walmart Supercenter.
- 2.) In June 2003, the fare-free project for holders of MaineCards was extended from the route serving the University of Maine to all BAT routes
- 3.) In October 2003, several significant changes were made:
  - I. The fare structure was changed to improve customer convenience, and make service more attractive to certain market segments;
  - II. A new route, Mall Hopper, connects Airport Mall on Union Street to the Broadway Shopping Center (Broadway) to the Bangor Mall on Stillwater Avenue;
  - III. The old Mount Hope Route was split between two new routes:
    - a) The Stillwater Route is a quick service from Pickering Square to the Bangor Mall via Stillwater Avenue;
    - b) The Mount Hope Route, rescheduled, provides two way service along the line of the old route at 60 minute headways; and
  - IV. Extra runs were added to the Hampden service, filling the gap in service that existed between 10 a.m. and 2:15 p.m.

In 2007, as a result of a short range transit study completed in that year, the Capehart route was augmented by the addition of a bus to weekday service, so that the route frequency could be increased. This allowed better on time performance on this heavily traveled route. Also, the Old Town route was reconfigured to improve on-time performance.

In the fall of 2009, BAT began operating a shuttle route connecting the Orono village area with the campus of the University of Maine (Orono) called the Black Bear-Orono Express. The service operates on 30 minute headways, from 6:55 a.m. to 9:55 p.m. Monday through Friday, 11:55 a.m. to 9:55 p.m. Saturday, when school is in session, during the academic year. The shuttle is funded jointly by the University, the Town of Orono, and the Federal Transit Administration. Enhancing the connection between the University campus and the surrounding communities has been a recommendation of various planning efforts since 2004. In its first year of service it carried 39, 317 rides.

See the BAT website at: [www.bangormaine.gov/cs\\_publictransit.php](http://www.bangormaine.gov/cs_publictransit.php) for more complete details of services, fares and route maps.

**Figure 4.1 Monthly Ridership System-wide**



4.2.1.2 Ridership: Fixed Route

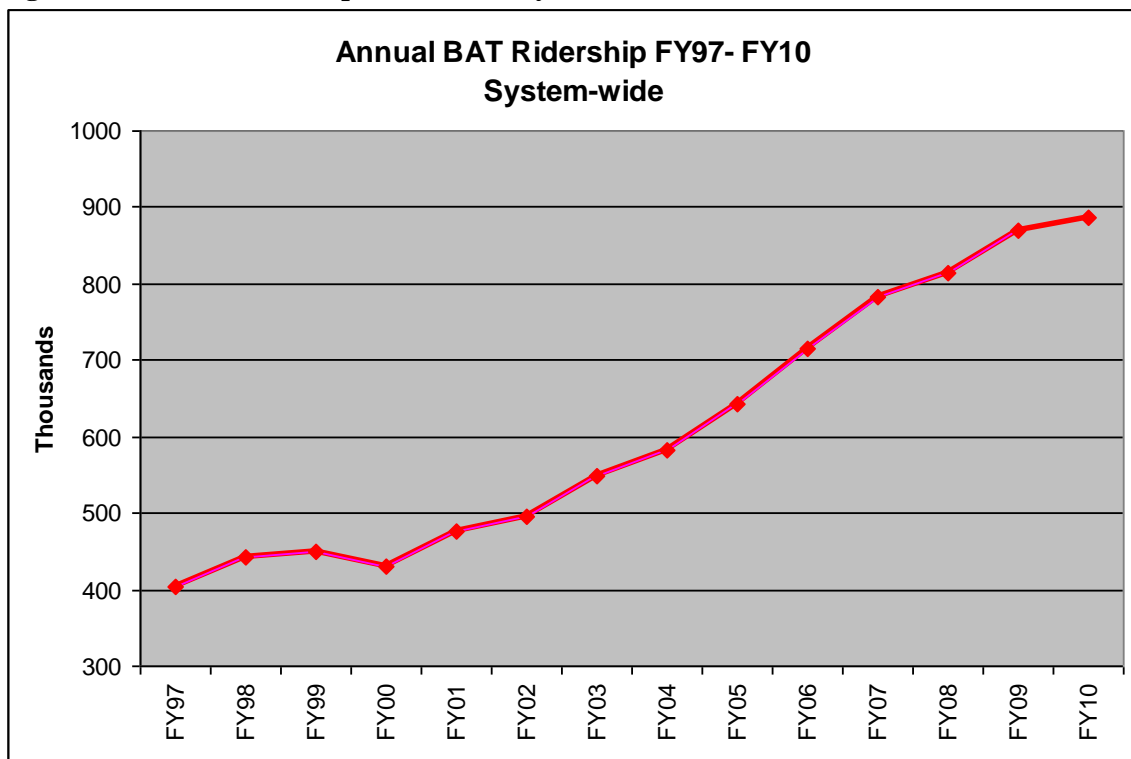
As can be seen in Figure 4.1, there has been an underlying upward trend in monthly ridership. This has been particularly pronounced since 2000. The upward trend in ridership may be explained by the improvements that BAT implemented early in FY97 based on the findings of a transit needs study conducted for BACTS by Tom Crikelair Associates entitled *An Evaluation of Public Transportation in the BACTS Area*. BAT introduced a monthly pass and increased marketing efforts, such as new schedules, route marking, and an improved web site. Also, some minor route and schedule improvements were introduced, such as the restoration of service on minor public holidays. The monthly pass has proved to be very popular; in February 2010, system-wide usage was



40 percent of all rides. In addition, BAT entered into an agreement with the University of Maine (Orono) to provide fare free rides to holders of MaineCards (students and staff) on the route serving the University. The purpose of the fare free project was to test the concept as a strategy to address the on-campus parking problems experienced by the University. The service did not involve the customization of the regular bus schedule to maximize use by students and staff. During the first month of the service, 2,805 MaineCard rides were provided. The program was made permanent after a review in January 2001 to assess its success and funding levels. The University has provided \$10,000 in fare replacement revenue per year and, due to the project's ongoing success in attracting riders, the service was extended to all routes for an additional \$5000 a year in June 2003. From September 2000 through June 2010, 595,585 rides were provided by this program.

BACTS commissioned a *Transit Route Redesign Study in the BACTS Area* by Tom Crikelair Associates in 2002. Several changes in routes were made, the fare structure was revised, new schedules designed, and a revamped vehicle livery was adopted as a result. The improvements were well received by the riders, and ridership continued to increase. The growing annual system-wide ridership is shown in Table 4.2 below.

**Figure 4.2 Annual Ridership FY97-FY10 System-wide**



Funding: Fixed Route

Funding for fixed route operations is provided through fare box receipts, local government funds, state funds, and Federal Transit Administration (FTA) funds made available through the MaineDOT. The City of Bangor provides bus service to the other

communities under contract. The FTA funds for operations come from Section 5307 – Urban Formula Funds. They are divided between operation and minor capital requirements, such as bus shelters, as needed by the operator. Major capital needs, such as vehicle procurement, are funded through statewide discretionary requests to the Congressional delegation, coordinated by MaineDOT. Regular replacement of aging vehicles in the fleet is continual. The extra bus for the Brewer route was procured using Job Access Reverse Commute (JARC) funds. Part of the operation of this route also comes from JARC funds.

#### 4.2.2 Other Public Transportation in the Region

##### Urban

The demand response provider, The Lynx, operated by Penquis, provides one-day-a-week door-to-door van service throughout the urbanized area. Fare box revenue and Penquis funds support the service. The Lynx also provides the Americans with Disabilities Act Complementary Paratransit service for the BAT, under contract with the City of Bangor.

##### Rural

The demand response provider, Lynx, provides door-to-door van service in Piscataquis and rural Penobscot Counties on weekdays. Apart from in-town service in a few rural towns, each area in the region receives one day a week service, allowing riders to get to Bangor. Fare box revenue, Penquis CAP funds, and federal funds support the service.

##### Inter-city

Concord Coach and Greyhound provide daily competing services from Bangor to southern Maine and beyond. West's Transportation provides daily service to Calais through Hancock and Washington Counties via U.S. Routes 1A and 1. Cyr Bus Lines provides Bangor to Caribou service once per day. DownEast Transportation provides a once-a-week service from Bar Harbor to Bangor via Ellsworth, along US Route 1A, and a once a month service from Bucksport to Bangor, along State Route 15. DownEast Transportation also operates a daily JARC funded subscriber service from Bangor to the Jackson Lab. in Bar Harbor. Acadia Lines provides daily service from Bangor to the Maritimes, with connections to the rest of Canada.

#### 4.2.3 Current Issues

Bangor and its surrounding region have undergone substantial economic development in recent years. Economic growth and its associated increase in traffic congestion have had negative impacts on the efficiency of the region's public transit system. The *Transit Route Redesign Study* investigated and made recommendations to address several of the system's deficiencies. Ridership levels will be monitored to determine the success of the strategies that have been implemented.

### Demand for additional Service

BAT has always received requests for bus service in areas not served. Some of the requests have been from residents needing service where they live. However, many requests have been from businesses and organizations wanting service at their locations. These requests reflect the importance placed upon the bus service by both residents and business owners. BAT has addressed these requests for additional service whenever feasible. However, this has often been accomplished by stretching the existing schedule so those additional destinations could be served. Increased traffic related to Bangor's economic growth makes it very difficult to maintain the "stretched" schedules. Boarding and alighting times further stress current schedules, since BAT carries more passengers each year.

### *Pulse System*

- BAT operates a pulse system designed to facilitate the timely transfer of riders on one route to another. The pulse system requires buses from all routes to meet at Pickering Square at the same time to ensure passengers do not have to wait too long between route transfers. There were 101,879 system transfers during FY2009 (July 2008-June 2009). Any future system changes will have to maintain or improve the ease of transfer at Pickering Square for riders on Bangor, Brewer, Hampden, and Old Town routes.

### *Route Changes*

- Overall ridership tends to decline whenever transit service is reduced on a particular route so as to increase service to a new area. This effect may last for several years, precipitating a loss in fare revenue thereby requiring increased subsidy. The ridership generated by the increased service may never compensate for the loss in ridership in areas suffering a reduction in service.

### *Additional Buses*

- Additional vehicles would enable service to be extended to areas currently not served, without reduction of service in other areas. Operating an expanded fleet of vehicles, however, requires additional funding.

### *Increasing Headways*

- Increasing headways (the time interval between successive bus arrivals) makes bus service less frequent and consequently less convenient. Riders would have to bear increased travel times by waiting for their scheduled bus or having to board an earlier bus. Multisystems: a transportation consulting firm, uses a formula to predict changes in ridership on transit routes. The formula predicts that increasing headways from 30 minutes to 60 minutes would result in a 27.6% drop in ridership. This prediction can be validated by experience in the Bangor area. BAT estimates that ridership dropped by at least a third in the mid 1980s on the Old Town route, when service on that route was cut back from 30-minute to 60-minute headways.

### *Longer Routes*

- Extending routes to serve additional areas increases ridership potential. However, because the route is longer, riders may be forced to spend extra time on the bus in order to reach their destination. During the early 1970s when BAT (then Citibus) was originally designed, all routes were one-hour routes. Customer dissatisfaction with long tours of the neighborhoods prompted the redesign of the routes resulting in much improved point-to-point times.

### Marketing and Innovative Projects

Marketing initiatives aimed at increasing BAT ridership or reaching the under-served populations require access to funds beyond those used for capital and regular support. Municipal budgeting is not flexible enough to respond quickly to emerging opportunities. However, the BAT has achieved positive results by partnering with non-municipal organizations. An example of a successful partnership is the MaineCard project with the University of Maine.

### Pedestrians

BAT's policy is to pick up or drop off bus riders at any location where it is safe to do so. The bus will stop at the nearest safe place if there is no sidewalk or a shoulder at the desired stop. It is important, therefore, to ensure that sidewalks or shoulders are provided along all the BAT routes and that they are maintained in good condition.

### Inter-urban

Current transit and paratransit services linking the urban area and the more rural areas surrounding it are very limited in passenger capacity. The formation of a suburban ring of towns around the urban area poses a problem and a challenge for public transportation. It would be beneficial if people could travel to and from the urban area without having to drive and contribute to traffic congestion. However, the low densities of the rural communities make efficient, economical route design difficult.

### Intermodal

Several public transportation providers operate within the urban area. The urban area lacks a location or facility where all riders can transfer between providers. This results in a loss of potential riders and revenues for all providers. Efforts to site an intermodal passenger facility at the Bangor International Airport were not productive. All modes of public transportation should be considered in the siting and design of the facility.

## 4.3 Future Conditions and Issues

Long range forecasting for a relatively small transit system does not provide reliable estimates for future use. Large percentage changes in ridership can occur for a variety of reasons such as the location of individual developments and the cost of operating automobiles. Since the lead-time in developing modest increases in service is short (2 to

4 years, depending on vehicle procurement), the lack of a long-range forecast is not important. Improvements can often be based on short-term considerations and emerging opportunities for ridership increases can be seized upon relatively quickly. In addition, the inherent flexibility in deploying the system's vehicles allows changing demands for transit service to be accommodated very efficiently, without necessarily adding to the vehicle fleet.

### Dependence on Public Transit

Ridership surveys, conducted during the 1996 Transit Needs Study, indicate that many riders have no alternative ways to get to work or other appointments. The cost of operating an automobile has been increasing and the trend towards an older population (especially in Maine) will likely increase dependence on public transit, due to increasing infirmity and a loss of driver's licenses. Marketing and service design will have to reflect these continuing changes.

### ADA

All of the buses used by BAT are wheelchair lift or ramp equipped and any future vehicles would also be wheelchair friendly. However, the provision of wheelchair lifts has several negative impacts on the operation of the system; the space taken by the lift reduces seating capacity; buses can only accommodate two wheelchair bound passengers; mechanical reliability can be problem, and when failure occurs operational difficulties can be time consuming to overcome; lifts represent additional equipment to be maintained; and boarding or setting down wheel chair riders is time consuming. ADA regulations require wheelchairs be boarded regardless of the impact on the bus's on-time performance.

### ADA Complementary Paratransit Service

BAT is required to provide an ADA Complementary Paratransit service for persons within ¾ mile of a bus route who cannot get to the route due to a disability, or are unable navigate the transit system. Penquis, under contract to the City of Bangor, provides the service. As provision of the service is very expensive, the eligibility of individuals and the rides they are requesting have to be carefully monitored, to ensure that those that need the service are properly served.

### Urban Paratransit

Paratransit service within the area for the general public is provided one day per week by Penquis. Paratransit serves people away from the bus routes and those who need door-to-door service, such as senior citizens needing special assistance getting in and out of the van. The service is limited by a lack of funding. Changing population demographics, such as the expected increase in aging baby boomers, will likely increase the need for this type of service.

### Taxi Service

In the Bangor area, taxi service is very often used by the public transportation dependent for trips at times when public transportation (fixed route or on-demand) is not available, and for those destinations not served. The importance of the role played by taxi service, for all riders, is likely to grow in the future.

#### 4.4 Recommendations

The BACTS Policy and Technical Committees have identified several strategies to improve public transit in the BACTS area. The strategies are listed below.

- Add regular scheduled service to coastal areas, especially Hancock County and Acadia National Park.
- Add service to towns around Bangor Area.
- Extend service within BACTS, including intermodal links.
- Provide evening service.
- Provide weekend service: add Saturday for Hampden, and Sunday for all routes.
- Increase frequencies, particularly Old Town route.
- Provide/improve passenger amenities – benches, shelters, landscaping, lighting, walkways, signage, etc.
- Improve marketing through local TV, radio, local access channel, and city channel.
- Examine cost effective options for providing ADA Complementary Paratransit service, as use of the service increases.
- Investigate partnerships with potential large ridership generators, such as colleges, hospitals, and employers.
- Implement an ITS-based – traveler information system – next bus arrival, etc.
- Implement transit priority at signalized intersections.
- Ensure that sidewalks are provided along all bus routes.
- Investigate opportunities for park & ride in the region.
- Study ways of coordinating the public transportation services in the BACTS area, including the siting of an intermodal passenger facility.
- Study ways to better integrate taxi service with other transportation options in the Bangor area.

## **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 179 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 18<sup>th</sup> and 19<sup>th</sup> 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 openings 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 20 years.

Since 2004, there has been no new alignment construction using federal or state funding in the BACTS region. There is only one new potential construction project known at this time; the connection of Route 9 to I-395 through a corridor across Brewer, Holden and Eddington. The recently completed I-95 Study recommended future study of impacts for new ramps and interchanges.

Sustainability and livability have been important characteristics of transportation planning for decades. More recently they have gained more widespread 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 was worked on improving sustainability and livability in our area and is committed to continuing these efforts. Sustainability, livability, and climate change are discussed in greater 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 five 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; urban 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 falling under BACTS jurisdiction is presented in Table B.1 in Appendix B.

**Table 5.1 Federal Functional Centerline (Lane) Mileage**

<b>Municipality</b>	<b>Major Urban Collector</b>	<b>Minor Arterial</b>	<b>Other Principal Arterial</b>	<b>Principal Arterial Interstate</b>	<b>Total Mileage</b>
Bangor	36.34 (74.96)	18.96 (44.85)	7.35 (21.67)	30.28 (50.33)	<b>92.93 (191.81)</b>
Bradley	2.68 (5.36)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	<b>2.68 (5.36)</b>
Brewer	4.73 (9.48)	3.15 (6.11)	9.2 (23.27)	10.22 (16.29)	<b>27.3 (55.15)</b>
Eddington	0.58 (1.16)	0 (0)	0.68 (1.36)	0.00 (0.00)	<b>1.26 (2.52)</b>
Hampden	1.69 (3.32)	3.64 (7.28)	7.65 (15.29)	0.00 (0.00)	<b>12.98 (25.89)</b>
Milford	1.20 (2.40)	3.47 (6.94)	0.00 (0.00)	0.00 (0.00)	<b>4.67 (9.34)</b>
Old Town	12.02 (24.05)	6.34 (13.03)	0.00 (0.00)	0.00 (0.00)	<b>18.36 (37.08)</b>
Orono	2.75 (5.50)	7.41 (15.50)	0.00 (0.00)	0.00 (0.00)	<b>10.16 (21.00)</b>
Orrington	0.00 (0.00)	3.31 (6.62)	0.00 (0.00)	0.00 (0.00)	<b>3.31 (6.62)</b>
Veazie	0.64 (1.28)	1.93 (3.86)	0.00 (0.00)	2.15 (4.30)	<b>4.72 (9.44)</b>
	<b>62.63 (127.51)</b>	<b>48.21 (104.19)</b>	<b>24.88 (61.59)</b>	<b>42.65 (70.92)</b>	<b>178.37 (364.21)</b>

The federal functional classifications have special significance in relation to the Penobscot Indian Nation. The Penobscot Indian Reservation on Indian Island in Old Town is federal property and is administered as the sovereign national territory of the tribe. 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. At present, the Policy and Technical Committees maintain contact with the Penobscot Indian Nation and the Nation is represented as a voting member of the BACTS.

### 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 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). 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 following highways are designated NHS routes in the BACTS area:

- Interstate 95 (I-95);
- Interstate 395 (I-395);
- Bangor, Hammond Street from I-95 off ramp to Maine Ave to Godfrey Blvd to the Airport Terminal;
- Union St. at I-95 in Bangor to Godfrey Blvd to Airport Terminal;
- Bangor Main St. from I-395 to Cedar St.; Cedar St. from Main St. to Summer St. and Summer St. from Cedar to Chamberlain Bridge to Main St. in Brewer.
- U.S. Route 1A (U.S. 1A) from the Hampden-Winterport town line north to State Route 9 (S.R. 9);
- S.R. 9 in Hampden from U.S. 1A west to U.S. Route 202 (U.S. 202);
- U.S. 202 from S.R. 9 in Hampden north to I-395 in Bangor;
- U.S.1A from I-395 in Brewer east to the Brewer-Holden town line; and
- State Routes 9/178 in Brewer from U.S.1A east to Hill Street in Eddington.

### Bangor I-95 Study

MaineDOT, along with BACTS and other stakeholders, conducted a study of Interstate 95 in the City of Bangor. 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 50 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 was 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.

To address safety and mobility concerns in the I-95 Corridor, MaineDOT considered a range of improvement strategies such as auxiliary lanes, intelligent transportation systems (ITS), transportation demand management (TDM), and interchange improvements. Within each of these strategies, specific actions were conceived and analyzed in terms of effectiveness at addressing safety and mobility concerns, capital cost, and implementation challenges.

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.

The complete study can be viewed at:

<http://www.maine.gov/mdot/planningstudies/bangori95study/index.htm>.

### 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 greatly 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 it also reduces the backlog of MaineDOT traffic counts within the region. Most importantly, the BACTS counts are directional whereas MaineDOT provides total vehicle counts only. The directional counts help to calibrate the BACTS traffic model, which leads to more accurate predictions of future traffic volumes. Table B.2 in Appendix B provides AADT and percentage growth figures for points along major BACTS traffic corridors since 2003.

### Truck Traffic

BACTS does not perform regular classification counts that would indicate the volume of truck traffic on our roads. A study performed by the MaineDOT in 2001 (*A Heavy Haul Truck Network for the State of Maine*) estimates heavy truck volumes in Penobscot County will increase by 49 percent on principal arterials, 84 percent on minor arterials and 155 percent on major/minor collectors for the period 2000 to 2015.

Much of the heavy truck traffic is re-routed from the interstate system to our minor arterials and collectors due to weight limits imposed on the interstate by the federal government. The current weight limit for our interstate system is 80,000 pounds, while the weight limits on non-interstate roads are 100,000 pounds.

In December 2009, the United States Senate allowed a pilot project for one year allowing trucks up to 100,000 pounds on this portion of the interstate system in Maine. They asked for a report back concerning impacts found during this pilot period. Maine DOT

concluded in a September 2010 white paper titled “Interstate Highway Truck Weights” that “*Current restrictions that force 100,000-pound six-axle semi-trailers off Maine’s Interstate Highway System north of and parallel to the Maine Turnpike are short-sighted in their intent as the Interstate Highway System is the safest and best place for these five- and six-axle commercial vehicles to operate in Maine. This opportunity does not affect or impact other states; it’s a situation with a solution that will be of great benefit to Maine. Based on previous studies and the stewardship responsibility for nearly 9,000 miles of Maine’s transportation infrastructure, MaineDOT is confident that allowing 100,000-pound GVW six-axle semi-trailers on Maine’s Interstate System results in a net benefit to the entire transportation system, far beyond the infrastructure benefits alone.*”

Maine’s federal delegation remains committed to changing federal legislation to allow heavy trucks to use Maine’s entire interstate system.

### 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

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. Brewer is also developing a truck route to a new business park being developed off the Wiswell Road.

## 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 such systems set up within its boundaries.

BACTS signal subcommittee reviews signal operations and maintenance issues within the region. This subcommittee has developed an inventory of equipment and their locations. The BACTS area has 135 traffic signals in operation, as of December 2010, 29 of which were flashing-light only. The vast majority of the signals are actuated by vehicles approaching the intersection, although a few timed-cycle signals are still in operation.

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 conducting field reviews in six locations along the I-95 Corridor in the Bangor area to determine if there is a need for additional variable message signs or variable speed signs.

## Vehicular Crash Rates

According to Maine DOT's latest statistics, in 2008 Maine experienced its lowest number of fatalities (155) in several decades. Despite reduced travel resulting from increased energy costs, this still translates to a reduction in fatalities per total miles driven as well. A crash rate is defined as the number of crashes per hundred million vehicle miles (hmv) driven. Maine's crash rate decreased in 2008, but is above the national average. Maine's crash rate is 215.6 crashes per hmv. The latest national rate in 2006 was 198 crashes per hmv. Maine's fatality rate of 1.07 fatalities per hmv 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 2006-2008 edition, there were 89 high-crash locations on roads in seven of ten BACTS municipalities: 57 in Bangor, 12 in Brewer, 5 in Old Town, 11 in Orono, 2 in Hampden, and 1 in Eddington and 1 in Orrington. These figures include local roads and rural areas of the municipalities, which are not part of the BACTS highway inventory. 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 5.2 High Crash Location**

<b>Location</b>	<b>Town</b>	<b>CRF</b>	<b>No. of Accidents</b>
Cedar and Third St.	Bangor	3.51	12
Fourteenth and Union St.	Bangor	1.19	23
Hammond, Clinton, Ohio and High St.	Bangor	1.52	20
Intersection of Bangor Mall, Mini Mall and Stillwater Ave	Bangor	4.18	34
Intersection of I-95NB exit 184 off ramp and Union St.	Bangor	1.42	31
Intersection of Hogan Rd. and Hogan Rd. Off Ramp	Bangor	1.29	43
Union St. and I-95 SB off Ramp	Bangor	1.48	34
Broadway and State St.	Bangor	3.30	10
Broadway and Grandview Ave	Bangor	1.22	20
Broadway and Hobart St.	Bangor	1.48	32
Union st. and Entrance to Mall	Bangor	1.47	41
Bridge 5798 (over Kenduskeag Ave) I-95 NB	Bangor	2.04	39
Rte 1A and Bus Rte 9	Brewer	1.04	41
Main Rd. and Riverside Dr	Eddington	3.96	14
Rte 2A(Stillwater) and College Ave	Old Town	1.46	26
I-95 on ramp from Stillwater Ave	Orono	4.77	9
I95 SB off Ramp to Stillwater Ave	Orono	2.82	22
I-95 NB off ramp to Stillwater Ave	Orono	3.63	9
Orono Veazie TL	Orono	1.47	21

### Transportation Improvement Projects

During the 2004-2011 Statewide Transportation Improvement Programs (STIP) the BACTS area has supported 67 highway projects, including new highway construction, highway reconstruction, level 1, 2, and 3 highway resurfacing, highway rehabilitation, and highway improvements. By comparison, the STIP also provided funds for 31 intersection improvements six bridge replacements, five bike and pedestrian related, 11 public transportation and four airport miscellaneous improvement projects and four planning studies under the non-highway elements of the transportation system

Highway projects in the BACTS area comprise of one half of the projects from 2004-2011. Highway projects also continue to dominate the BACTS transportation planning and budgeting process as well. The BACTS Biannual Transportation Improvement Programs (BTIP) from 2006-2013 currently has 59 projects scheduled for construction. For a complete list of all the BACTS BTIP projects see Table B.3 in Appendix B.

### Carpools and Vanpools

BACTS supports and promotes GoMaine to encourage participation in a carpool and vanpool matching program in the greater Bangor area. Matching programs have worked well in both the greater Portland and Augusta areas, where the larger state government work pool is available to populate the database. BACTS will continue supporting the GoMaine rideshare program in developing routes to and from the BACTS region.

### Major River Crossings

The Penobscot River runs the length of the BACTS metropolitan area. Tidal as far as the Veazie Dam, 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. Nine 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.

## 5.3 Deficiencies

### Lack of adequate funding

There is not enough funding to address all of BACTS highway needs. The BACTS highway inventory, as is the case at the state level, contains numerous sections of road

that do not meet the American Association of State Highway Officials (AASHTO) national design standards. Many of the highways do not even meet reduced state standards for drivability and safety. These sections of road are commonly referred to as "unbuilt roads". These projects should be a priority to be improved when funding is available. Some roadways have a higher strategic value than others 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, lower-priority projects (including most of the collector road system) remain as unbuilt. MaineDOT has made a commitment towards reducing the number of unbuilt road mileage if funds become available. Prioritization of critical projects will, however, probably remain a necessity of the BACTS planning process over the next 20 years.

### 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 period 2011-2036.

- Stillwater Avenue:
  - Intersection at the southern mall entrance and The Avenue on Stillwater Avenue. (Highest crash rate in BACTS area, 2000-2002.)
  - I-95NB on/off ramps at Exit 193 in Orono
  - Narrow twin bridges over Stillwater River in Old Town
- Union Street from 14<sup>th</sup> to Griffin Road.
- Wilson Street (Route 1A) from Acme Road to I-395 in Brewer - (Projects to improve the flow of traffic and update signals have been funded in the 2010-2013 Capital Work Plans)
- Cross-town connector roads between major inbound/outbound routes; e.g., Burleigh Road, Griffin Road.
- Intersection at Cedar & Third in Bangor
- Route 16 (Bennoch Rd.) in Orono/Old Town Route 2 to Stillwater Avenue.
- Route 2 in Milford

### Signal Conditions

BACTS now has an up to date inventory of all the signals and currently there are many interconnected signal systems in the BACTS region. Interconnecting and coordinating signal systems aids 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.

Phase 1 of a Signal Study was completed in 2009 which developed a plan to interconnect and coordinate Broadway and Union Street corridors in Bangor, as well as, review the equipment and timing plans at the Orono Main Street and Old Town Center Street Signals. The Broadway and Union Street projects are complete and the Orono and Old Town projects are currently under construction.

Phase II of this study completed in 2010, focused on the conditions of the signals in the BACTS region. Recommendations were made and as a result of those recommendations the Policy Committee in the 2012-2013 BTIP approved ten projects to update signal equipment. Among those ten were projects to interconnect the Penobscot Bridge Corridor which spans the Penobscot River between Brewer and Bangor as well as update signals along Wilson Street in Brewer so that the corridor could then also be interconnected and coordinated.

In the 2010-2011 BTIP a project to interconnect Hogan Road in Bangor was approved and Stillwater Avenue in Bangor was also interconnected and coordinated in 2009 as a result of continuing development on that corridor.

#### 5.4 Future Conditions and Issues

As 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 the condition of our roadways will become increasingly costly to maintain. A review of past growth from 1992 to 2003 indicated that volume of traffic was increasing significantly on our arterial roadways. Current reviews are painting a much different picture.

Traffic no longer is increasing as it was up to 2003. Most count sites show a decrease in traffic between 2003 and 2008. Where increases were still occurring the amounts were very low. These decreases were occurring before the economic recession began and were probably connected to increased fuel costs. There is also evidence that further decreases have taken place since the 2008 count numbers were released.

#### 5.5 Recommendations

The BACTS Policy and Technical Committees have identified several strategies to improve the highway network in the BACTS area as listed below.

##### Traffic Volume:

- Advocate for improvements to the I-95 corridor recommended in the recently completed I-95 study.
- Continue to advocate for reconstruction of the narrow twin bridges over Stillwater River in Old Town.
- Continue to improve capacity and efficiency on Wilson Street (Route 1A) from Acme Road to I-395 in Brewer.
- Continue to improve Route 1A in Hampden southerly to Route 9.



- Advocate for construction improvements to I-95 on/off ramps at Exit 193 in Orono as recommended in previous studies.
- Continue to improve Route 2 in from the Penobscot River Bridge project northerly in Milford.
- Continue to improve Route 16 (Bennoch Rd.) in Orono/Old Town from Route 2 to Stillwater Avenue.
- Continue to work with Maine DOT to investigate possible safety improvements at the Cedar & Third intersection in Bangor
- Work with Maine DOT to investigate possible safety improvements at both the southern mall entrance and the I-95 ramp intersections on Stillwater Avenue in Bangor.
- Advocate for construction improvements to I-95 on/off ramps at Exit 193 in Orono as recommended in previous studies.
- BACTS should conduct a study of Union Street in Bangor to address the impact of increased volume and commercial development along the corridor.
- Recommendations outlined in recent corridor studies should be implemented as funds become available and as appropriate. Appendix C contains a list of transportation studies conducted since the last Long Range Plan
- Work to improve cross-town connector roads between major inbound/outbound routes in Bangor such as Burleigh Road and Griffin Road.

#### Truck Volume:

- BACTS should continue to advocate an increased weight limit on Maine's interstate system to reduce heavy truck traffic on our minor arterial and collector roads.

#### Traffic Signals:

- BACTS should continue to study signal coordination, phasing/timings along all major corridors in the region.
- The Traffic Signal Committee for BACTS should, continue to maintain the equipment inventory, review standardization of equipment and implement a maintenance plan for all signals within the region.
- BACTS should conduct a study to review and plan for a central traffic signal operations center.

## **6.0 Bicycle and Pedestrian Transportation**

### **6.1. Introduction**

Residents of the BACTS area, like many urban areas across the country, are becoming increasingly conscious of the importance of creating a more livable and sustainable community. In order to reach this goal, communities are developing plans to outline ideas for improving mobility. People are beginning to look for alternative modes of travel as the price of gasoline increases and the awareness of the environmental effects of motor vehicle travel increases. It is important for urban areas to provide adequate facilities for non-motorized travel.

BACTS has made a commitment to develop a multi-modal transportation system. This chapter is consistent with the requirements of the federal Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) legislation, the Federal Highway Administration (FHWA), and the Maine Department of Transportation (MaineDOT). This chapter encourages and supports safety and security for bicycle and pedestrian travel. The plan will preserve and enhance the existing transportation infrastructure. In practice, this means working to create an environment in which it is easy to choose walking and bicycling as a means of transportation.

Most of this chapter is taken from the “*BACTS Long Range Transportation Plan Update: Bicycle and Pedestrian Transportation*” report produced in June 2009. The entire report can be viewed on the BACTS website at: [www.bactsmo.org](http://www.bactsmo.org).

### **6.2. Existing Conditions**

#### **6.2.1 Pedestrian and Bicycle Crash Data**

The BACTS 2005 Bicycle and Pedestrian Plan included an analysis of crash report data from 1994 to 1999 to better determine the circumstances surrounding bicycle and pedestrian crashes in the BACTS area. For that time period, there were 129 reported highway crashes involving pedestrians and 95 crashes involving bicycles in greater Bangor. According to MaineDOT, there were 101 bicycle related crashes including 1 fatality and 168 pedestrian related crashes including 12 fatalities in Penobscot County between 2004 and 2009.

#### **6.2.2 Pedestrian Facilities**

The 1996 BACTS Pedestrian Plan inventoried and mapped existing roads with sidewalks throughout BACTS. The sidewalk inventory was updated town by town in 2000 and 2004. In 2009, BACTS staff completed a sidewalk inventory which includes the sidewalks within 3/4 mile of the current BAT bus routes. This 2009 Long Range Plan update incorporates the previous information into the current, GIS based BAT sidewalk inventory. The updated data serves as the base for the pedestrian facility recommendations included in this Plan.

### 6.2.3 Destinations

The 1996 plan included “Desire Lines” map which indicated the most important routes that local residents were interested in traversing via bicycle or on foot. The map was meant to track the links between origins and destinations for bicyclists and pedestrians. This map is still relevant due to the development of medical and office buildings near the intersection of Wilson Avenue and I-395 in Brewer.

### 6.2.4. On-Road Bicycle Facilities

The 1996 Plan included recommendations for on-road regional bicycle routes. The 2009 update adds existing trails highlighted in other local or regional studies. It also included an accurate evaluation by on-the-ground cycling of the majority of the BACTS primary and secondary bicycle routes to determine their current condition. The updated data serves as the base for the bicycle facility recommendations included in the *BACTS Long Range Transportation Plan Update: Bicycle and Pedestrian Transportation*

### 6.2.5 Off-Road Bicycle Facilities

Off-road facilities, or shared use paths, are separate paths for bicycles and pedestrians that are at least ten-foot wide with a surface that is ADA compliant. Shared use paths are best used to serve areas that are not served by streets. Placing shared use paths adjacent to roadways is only advisable where there are no driveways that need to cross the path and the adjacent roadway is not readily appropriate for use by bicyclists. Shared use paths should provide special routes for bicyclists and pedestrians that are not available on the existing roadway system.

### 6.2.6 Intermodal Connections

Pedestrians and bicyclists can expand their transportation range and options greatly by connecting with other modes such as public transit. Public transit in the Bangor Area, via the BAT, offers convenience for pedestrians and bicyclists by providing simplified fares, university-subsidized, and monthly-discount ride passes; multiple routes to popular commuter and shopping destinations; wheelchair access; and bicycle racks on the front of each bus. BACTS municipalities and area businesses have begun to provide downtown bicycle racks to accommodate more bike-and-walk trips.

## 6.3 Deficiencies

### 6.1 Current Conditions

While there has been much progress in making the BACTS area more bicycle and pedestrian friendly over the past seven years, there are still areas or situations where deficiencies exist in the regional system. The following pages outline noted deficiencies in these systems. The BACTS 2009 Bicycle and Pedestrian Plan update notes the following deficiencies within the BACTS area:

### 6.1.1 Sidewalks

- Many sidewalks are not yet ADA compliant, as noted in a recent BACTS sidewalk inventory study related to pedestrian access to the BAT system.
- Sidewalks are nonexistent on at least one side of many urban streets.
- Several key lengths of sidewalks that are important to the regional system of pedestrian facilities are nonexistent.
- Crosswalks are missing or difficult to see at the majority of intersections in the BACTS Area.
- Several BACTS roads continue to decline in their ability to accommodate pedestrians, as restriping, intersection improvements, or other modifications remove or limit existing shoulders or facilities.

### 6.1.2 Shoulders and Lanes

- High volume traffic routes with or without curbed sections and no or minimal striped shoulders such as Stillwater Ave. between the I-95 ramp and the Maine Mall or Hogan Road in Bangor.
- Broken and potholed pavement at shoulder or roadbed areas.
- On-street parking with less than four feet between parked vehicles or parking stripes and the edge of the travel lane.
- Non Bicycle safe catch basin rims, poor grading around catch basins, or other uneven utility covers in bicycle lanes.

### 6.1.3 Bridges

- Nearly all river and interstate bridges create conflicts or barriers to bicycles, due to insufficient shoulders or bike lanes, deteriorating bridge deck surface, or poor bridge deck joints, coupled with heavy vehicular use and/or poor pavement conditions.
- Poor bridge conditions for bicyclist have a compounding effect of potentially putting cyclists on sidewalks which creates a significant and very real pedestrian hazard.

### 6.1.4 Intersections

- Many intersections are not yet ADA compliant for pedestrians.
- Most intersections do not have visible or well striped crosswalks or stop bars (See also Sidewalks, above).
- Many intersections routinely reduce or eliminate paved shoulders by the addition of turning lanes without providing signage or directions alerting bicyclists and motorists that they need to share the road through the intersection.
- Few intersections contain bike lane markings, lane striping or advance bike lane signage to alert motorists to the potential for cyclists within intersections.
- Most signalized intersections do not have advance bicycle detectors/sensors which can be activated by bicycles.

- Bangor in particular, contains a number of wide streets (36 to 42 feet wide or greater) and wide intersections which do not contain center medians as “refuge islands” or audible pedestrian signals to encourage safe use by pedestrians.

#### 6.1.5 Community Linkages

- Neighborhoods are not fully connected to desirable destinations, such as schools, businesses, public services, recreational facilities, or other neighborhoods via adequate bicycle and pedestrian facilities.

#### 6.1.6 Signage

- Very few directional or informational signs are oriented to serve bicyclists or pedestrians on both on-road and off-road facilities.
- Almost no regional bicycle routes or facilities are signed to alert bicyclist or motorists to their existence.
- There are few, if any, “Share the Road” signs in the BACTS Area.
- Many intersections lack signage alerting motorists to the need to yield to pedestrians in crosswalks when making turns.

#### 6.1.7 Maintenance

- Maintenance of bicycle and pedestrian facilities does not seem to be given equal priority with roadway maintenance for motorists, creating safety and accessibility issue for users.
- Roadway pavement edges are not always smooth or level with the adjacent shoulder area. Roadway shoulders are often filled with gravel, sand, broken glass, or other debris creating safety issues for bicyclists and pedestrians.

### 6.4 Future Conditions and Issues

National and local trends both indicate greater interest in walking and bicycling as a transportation mode. This increase can be expected to create additional issues and demands for BACTS and its member communities, including:

- Demand for good pedestrian and bicycle facilities, particularly off-road shared use paths outstrips supply;
- Continued need for adding or retrofitting ADA compliant traffic signal actuation and pedestrian phase indicators; and
- The need to provide more bicycle and pedestrian amenities, such as longer pedestrian signal phases, traffic islands, wide paved roadway shoulders or bicycle lanes, or sidewalk benches in order to enhance economic development and make BACTS communities more livable. An example of this is the desire to connect the Bangor International Airport, Odlin Road hotels, the Bangor municipal golf course, Bass Park and Raceway, the new Bangor Arena under construction,

Hollywood Slots and the Bangor Waterfront. A necessary near term component of this off street bicycle pedestrian corridor is a pedestrian overpass over Main Street in Bangor.

## 6.5 Recommendations

Based on the identified deficiencies and anticipated future conditions as discussed above, BACTS staff, local municipalities, not-for profit groups and others can pursue the following strategies to address existing deficiencies and future needs for walking and bicycling.

The following recommendations are typically for BACTS and its member municipalities, but many can equally apply to not-for-profit organizations, advocacy groups, private businesses, or individuals. The complete *BACTS Long Range Transportation Plan Update: Bicycle and Pedestrian Transportation* can be found at [www.bactsmmpo.org](http://www.bactsmmpo.org). The recommendations are numbered to make identification of specific recommendations easier.

### Pedestrian and Bicycle Safety

- Identify high pedestrian or bicycle crash locations and help in the development of information on how to reduce crash rates either by design or education.
- Identify and address crosswalk deficiencies at intersections.
- Maintain sidewalks and road shoulders throughout the year to minimize safety and accessibility problems.
- Add “Share the Road” signage.
- Recommend the use of Maine’s interstate funding to improve bicycle and pedestrian mobility at problematic off-ramp locations, such as the Hogan Road overpass.

### Bicycle/Pedestrian Facilities

- Add appropriate bicycle and pedestrian accommodations to roadways when undertaking repaving, upgrading, or reconstruction projects.
- Build a pedestrian overpass over Main Street in Bangor near the new Arena.
- Support regional efforts to create a willing-buyer, willing-seller multi-user path along the old Veazie Railroad bed from Bangor to Orono.
- Add sidewalks to existing roadways where either current or latent pedestrian traffic demand exists.
- Create wider paved shoulders or bicycle lanes on existing roadways by restriping where there is now adequate pavement width and either current or latent bicycle traffic demand exists.

### Intersections

- Upgrade signals at intersections with significant pedestrian traffic to include appropriate pedestrian phases and signalization.

### Education Programs

- Support *Commute Another Way Week*, “Safe Routes to School” initiatives and Walk to School/Bike to School events.

### Complete Streets

- Encourage member municipalities and MaineDOT to routinely provide appropriate accommodations for bicyclists and pedestrians on roadway projects.

### Maps

- Work with Greater Bangor Convention and Visitors Bureau (GBCVB), MaineDOT and others to develop a regional bicycle map to promote more bicycling within the BACTS area and to encourage more tourist economic activity based on bicycling.

### Funding and Grant Writing

- Advocate and look for greater funding from a wider array of sources for bicycle and pedestrian transportation improvements at the federal, state, and local level.
- Assist communities with funding applications to provide bicycle-pedestrian facilities.
- Provide information on successful grant writing for use by member communities.

### Bike Support Facilities

- Encourage installation of more bicycle racks and sidewalk benches, at municipal and business properties particularly in downtown locations, in public gathering spaces, and intermodal facilities.

### Signage

- Provide easy to understand bicycle route signage along regional and local on-road bicycle facilities.

### Intermodal Connections

- Address the accessibility issues noted in the BACTS Sidewalk Assessment for sidewalks within ¼ mile of a BAT line.

## **7.0 Air Transportation**

### **7.1 Existing Conditions**

#### **7.1.1 Bangor International Airport**

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 101<sup>st</sup> 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 US 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.

Recent capital improvements at Bangor International Airport include runway rehabilitation, ramp and apron resurfacing, and construction of a secondary containment facility for fuel trucks totaling \$17 million. 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.

#### 7.1.2 Dewitt Field (Old Town Municipal Airport)

Dewitt Field is a general aviation airport (no scheduled passenger service) owned by the City of Old Town. The airport is located on about 360 acres of land on the north end of Marsh Island. The airport's primary runway is 3,600 feet in length and 100 feet in width, and the secondary runway measures 3,200 feet in length by 100 feet in width. In 2009, there were over 22,000 flight operations and 47 aircraft based at the airport. The Maine Forest Service is headquartered at Dewitt Field and has its own seaplane base located on the Penobscot River adjacent to the airport. The current MaineDOT Systems Plan indicates DeWitt Field will not reach its full operating capacity within the next 20 years.

### 7.2 Future Conditions and Issues

#### Economy

The region's economy poses challenges to sustaining profitable commercial air service operations. The seasonality of BGR's air service demand causes air service providers to discontinue flights during off-season. BGR's busiest times reflects summer, autumn, and mid-winter tourist seasons with lower demand during the "shoulder seasons." Airlines find it difficult to schedule additional flights during times of peak demand.

#### Flight Ratios

BGR's ratio of pleasure vs. business passengers is not appealing to air service providers. While airlines are attracted to a ratio of 85 percent business travelers and 15 percent leisure travelers, BGR's traffic consists of 75 percent leisure and 25 percent business passengers. A major conference center located in Bangor and the resulting increase in business related passengers to the Bangor area (via BGR) would make BGR more attractive to air service providers.

#### Intermodal Connectivity

BGR lacks intermodal connectivity to many of the region's tourist attractions. Direct transportation connections at BGR, via rail or bus, to tourist destinations such as Acadia, Sugarloaf, the Moosehead area, and Baxter State Park would make BGR much more marketable, thus attracting additional air service providers. Passenger rail service to Bangor, restoration of the Calais Branch with a connection at BGR, and regional bus service at BGR would allow tourists to fly into BGR and immediately board a bus or train to their favorite destination.

#### De-regulation

De-regulation continues to be a significant factor in limiting rural service. Airlines tend to withdraw from smaller non-hub airports and cities and seek out larger revenue producing airports.

### 7.3 Recommendations

- Promote and support the construction of a major conference center in Bangor which will make BGR more attractive to air service providers.
- Explore the feasibility of developing a containerized inland port, or intermodal facility, near BGR or Northern Maine Junction and supported by future port expansion at Searsport.
- Conduct a study to determine the feasibility of developing air cargo services at BGR for niche markets such as Maine lobster.

## **8.0 Rail Transportation**

### **8.1 Existing Conditions**

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, Pan AM Railways and Montreal, Maine, and Atlantic (MMA), which provides freight rail connections to Canada and the remainder of the United States, serve the BACTS area.

*Pan Am Railways.* 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 Boston and Maine line extends from the New Hampshire border to Portland, where it connects with the Maine Central line.

The Maine Central and the Springfield Central lines (Guilford Industries) extend from Portland, through Waterville, through Northern Maine Junction in Hermon, then through the BACTS area (along the Penobscot River in Bangor, Orono, 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. A second rail line, known as the Calais Branch and now owned by the State of Maine, extends from Brewer to Calais. The Calais Branch has been inactive since 1985 and MaineDOT has proposed several options for the line's reuse including freight and passenger rail traffic, bus service, and a recreational trail for hikers, bikers, and snowmobiles. The Calais Branch east of Ellsworth has been converted to a multi-use trail while a portion of the line west of Ellsworth is being leased by the Downeast Scenic Railroad for excursion trips.

Typical products hauled by Pan Am for the paper mills include finished paper rolls, clay, tapioca, chlorine, and other chemicals.

*Montreal, Maine, and Atlantic Railroad.* The Montreal, Maine, and Atlantic Railroad (MMA) extends from the Mack Point pier facility in Searsport to Northern Maine Junction in Hermon (located just west of Bangor International Airport), through the northwestern corner of Bangor north to the Millinocket area and Aroostook County. MMA hauls coal, salt, chemicals and petroleum to the BACTS area, Northern Maine Junction, the paper mills in Bucksport and East Millinocket, and north to Aroostook County destinations.

Roadway bridge heights along the rail line are high enough so as 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.

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.

MMA filed a Notice of Intent in October 2010 to abandon 233 miles of its track in northern Maine between Millinocket and Madawaska. MMA cited financial losses along this section of track as the primary reason for the abandonment request. The State of Maine proposed purchasing the track to avoid a disruption in rail service to the northern Maine and the resulting impacts to the economy. The State completed the purchase agreement and will be leasing the track to Eastern Maine Railroad to operate the line after July 2011.

There are no passenger rail facilities located in or serving the BACTS area.

## 8.2 Future Trends and Issues

- MMA railroad is receiving an increasing number of grade crossing requests throughout the state. Additional grade crossings create operational and safety hazards and increases the railroad's maintenance costs.
- The railroad bridge (owned by Pan Am Railways) crossing the Penobscot River between Bangor and Brewer is in poor condition. The bridge should be replaced and realigned. The bridge approach is from the north, or upriver side, and trains originating downriver at Northern Maine Junction and bound for Brewer and Bucksport must travel upriver of the bridge on the Bangor side and then run backwards to cross the river. The situation is reversed when traveling in the opposite direction.
- The railroad companies have limited capital to invest in needed improvements to rail beds, rails, ballast, etc.
- The BACTS area lacks trackage rights to a short section of track on the Calais Branch in Brewer.
- The BACTS area lacks passenger rail service between Portland and Bangor.
- Lack of coordination at private, local, state, and federal levels when utilities and roadways cross railroad corridors.

## 8.3 Recommendations

- Transportation, energy, and utility corridors and rights-of-way are a resource that should be preserved for any potential future use or reuse. Unused rights-of-way

should be identified so as to prevent a reversion back to abutting landowners thus threatening their use for transportation purposes.

## **9.0 Marine Transportation**

### **9.1 Existing Conditions**

*Penobscot Bay and River.* Historically, the Penobscot River played a key role in shaping the development of central and eastern Maine. Beginning in the late 1700s, the river was used to provide transportation to the region, to power sawmills, and to float and boom logs used in the 1800s in 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 to the economy of the region has declined in recent years as the movement of fuel, raw materials and products have moved away from Maine's coast and inland rivers to trucks, rail lines, and pipelines. There is no passenger marine service and minimal commercial marine transportation in the corridor other than occasional asphalt and petroleum barge shipments. However, new manufacturing opportunities have arisen in Brewer that may return the Penobscot River to its status as a vital transportation asset linking eastern Maine communities to world markets.

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 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.

The City of Bangor has asked the Army Corp 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.

#### 9.1.1 Existing Marine Facilities

##### 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 warehousing was recently completed. 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 Searsport, are now shipped via rail to Mack Point. The logs are then transloaded onto trucks for the last 15 miles to the Searsport sawmill. This transloading from rail to truck has reduced the overall number of trucks as they travel from northern Maine forests to Searsport 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. In 2009 Searsport was the 10<sup>th</sup> busiest for the importations of wind turbine components. A new large propane terminal has been proposed for Mack Point and is moving through the permit process. 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, who, in anticipation of developing a cargo port on the island, constructed a causeway in the 1980's providing road access between Sears Island and US Route 1 on the mainland.

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.

#### 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, office, and 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, includes 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' by 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, a public boat launch facility for recreational vessels, 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'x10' 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.

### Eastern Manufacturing Facility

Cianbro, a heavy industrial and civil engineering construction company, has redeveloped the former Eastern Fine Paper mill site into a modular construction facility. The Eastern Manufacturing Facility features a deep water bulkhead that will accommodate large ocean-going barges for transporting 1,000 ton modules for industrial process plants. Cianbro is also constructing a smaller commercial dock system located immediately upriver of the deep water bulkhead which will be available to meet the marine shipping needs of other BACTS area businesses.

### 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.

## 9.2 Future Conditions and Issues

Commercial marine traffic continues to decline along the Penobscot River. Terminal operators indicate that, although they desire to maintain commercial marine facilities along the river, they receive the vast majority of their products via pipeline. Commercial marine traffic may become more viable once the Penobscot River receives maintenance dredging to restore the navigation channels to historic depths.

The port at Mack Point, Searsport, having recently undergone major renovation and improvements, will continue to be the major coastal port for eastern, central, and northern Maine. MaineDOT anticipates that tapioca, utilized as a modified food starch and a thickener for paper manufacturing, will be added to the list of commodities shipped inbound to the port at Mack Point. Port officials have indicated, however, that the approach channel to the port has shoaled over which prevents vessels from entering or leaving the facility except at high tide.

Recreational marine traffic is increasing in the BACTS area due primarily to improved dockage facilities and increased mooring space. The present river depth of 11 feet at low water is adequate for most recreational vessels. Bangor and Brewer are both proposing waterfront redevelopment plans that will improve opportunities for recreational boating and passenger ferry opportunities.

The City of Bangor owns about one mile of Penobscot River frontage which extends from the confluence of the Kenduskeag Stream and the Penobscot River to immediately upstream of the I-396 Veterans Remembrance Bridge. This property includes a public boat landing and docking facilities. Bangor has designated this river frontage for redevelopment with commercial and recreational uses. Plans tentatively call for expansion of the existing recreational marina facility, a hotel, a convention center, and walking paths along the shorefront. No industrial land uses are planned for this area.

The City of Brewer also plans to redevelop its river frontage between the Penobscot Bridge and the south Brewer. Brewer is proposing several components to the park including paths for walking and biking, a river museum, a recreational day use boating pier, a commercial pier, and a parking plaza that will accommodate automobiles and bicycles. The commercial pier may provide docking for Coast Guard vessels during ice breaking activities over the winter months.

### 9.3 Recommendations

- Support improvements to Mack Point, Searsport such as dredging of the approach channel to the port. Port operations are hampered by shallow water depth requiring deep draft vessels to enter and leave the port facility during high tide.
- BACTS should support the City of Bangor in its efforts to encourage deep draft vessel traffic on the Penobscot River by dredging the Penobscot River.
- BACTS should encourage MaineDOT to study the feasibility of constructing an intermodal facility at the Bangor waterfront.

## 10.0 Financial Issues

### 10.1 Existing Conditions

SAFETEA-LU requires this Long-Range Plan to be fiscally restrained so that it proposes only projects that have a chance of being funded based on projected revenues over the next twenty years. Table 10-1 summarizes project funding levels and sources covering the last four BACTS' Capital Work Plans (CWP). Amounts are in 2011 dollars and are not corrected for inflation.

**Table 10-1 BACTS Project Funding Levels for Capital Works Plans 2006-2013**

Revenue Source	Capital Work Plans				Biennial Average	20-Year Estimate
	2006-2007	2008-2009	2010-2011	2012-2013*		
STP/NHS	\$3,371,079	\$5,990,686	\$6,444,190	\$4,311,217	\$5,268,652	\$52,686,517
Interstate Maint.	\$264,839	\$11,510,149	\$1,957,253	\$13,528	\$4,577,414	\$45,774,137
Quality Community			\$535,200		\$178,400	\$1,784,000
Safety			\$278,550	\$225,450	\$92,850	\$928,500
State	\$222,581	\$2,014,940	\$1,461,367	\$859,729	\$1,232,963	\$12,329,627
Local/other	\$343,968	\$2,772,757	\$1,020,168	\$188,263	\$1,378,964	\$13,789,643
Bridge	\$5,203,438	\$1,020,602	\$801,457		\$2,341,832	\$23,418,323
High Priority			\$649,208		\$216,403	\$2,164,027
<u>Transit</u>						
MPO Planning	118,411	103,824	142,241	142,710	\$121,492	\$1,214,920
Federal Urban	1,561,875	1,612,205	1,627,171	1,647,575	\$1,600,417	\$16,004,170
State	109,924	251,955	277,873	87,860	\$213,251	\$2,132,507
Local	889,139	999,547	1,274,255	1,661,510	\$1,054,314	\$10,543,137
Other	1,102,969	1,560,225	1,711,565	2,126,009	\$1,458,253	\$14,582,530
<b>Total</b>	<b>\$13,188,223</b>	<b>\$27,836,890</b>	<b>\$18,180,498</b>	<b>\$11,263,851</b>	<b>\$17,617,366</b>	<b>\$176,173,655</b>

*\*The FY 2012-2013 has not been completed and therefore not used in the average or 20 year estimate columns.*

Airport and railroad projects are not included in this table. Those projects will be funded through Federal Aviation Administration (FAA), the Federal Railroad Administration (FRA), and sources other than FTA and FHWA. The level of funding for those projects is determined on a statewide basis by MaineDOT. However, BACTS controls the allocation to projects of part of the STP and transit funds.

## 10.2 Future Conditions and Issues

MaineDOT determines the amount of STP/NHS funding allocated to collector and arterial projects in the MPO area while BACTS determines which projects receive funding. CWP details, such as the number of projects submitted and their value, are presented in Table 10-2. The majority of these projects are resurfacing and intersection improvements.

**Table 10-2 BACTS STP/NHS Funding**

<b>Capital Work Plan Year</b>	<b># of projects submitted by BACTS municipalities for consideration</b>	<b>Value of these submitted projects</b>	<b># of BACTS Projects accepted in that year's CWP</b>	<b>Value of BACTS STP/NHS projects accepted in CWP</b>
2006-2007	42	\$15,989,479	12	\$5,426,000
2008-2009	33	\$7,106,000	12	\$3,212,438
2010-2011	38	\$17,361,538	11	\$4,940,300
2012-2013	42	\$12,658,363	21	\$4,940,300*

\* Estimated amount. Federal legislation not complete at this time.

MaineDOT's long range plan, "Connecting Maine: Maine's Long Range Transportation Plan" states, "Construction-cost inflation and significant increases in energy costs have also reduced the purchasing power of the motor-fuels tax. The cost of construction materials has significantly outpaced the rate of consumer inflation, due to increased asphalt and fuel costs plus worldwide demand for construction materials." MaineDOT's long range plan goes on to say "As alternative fuels and more efficient vehicles come into greater use, motor-fuel tax revenues will be a less viable option to support transportation improvements. While these changes create cost savings for motorists and benefit the environment by reducing greenhouse gas emissions, they also create reduced revenues needed for transportation financing."

The amount of funding allocated by MaineDOT to BACTS over the past eight years is about 35 percent of the amount for projects submitted by the municipalities for consideration. The municipal list of essential projects would be much greater if more funding were available. The municipalities submit only those projects that are most in need of repair and that have a chance of rating high enough for possible selection for funding. Projects that go unfunded either: 1) continue to deteriorate further, resulting in even higher reconstruction costs; or 2) force municipalities to pay 100 percent of reconstruction costs instead of typical local match amounts (0 to 15 percent) needed for state and federally funded projects. The process of prioritizing important projects becomes increasingly difficult with flat or declining funding levels. This trend is not likely to change and future earmark projects are unlikely.

### 10.3 Recommendations

The BACTS Policy and Technical Committees have identified the following recommendations:

- BACTS will seek increased funding for construction projects in the BACTS area from any possible funding sources including MaineDOT, FHWA, FTA, Federal delegation high priority projects, research funding sources and grant sources.
- BACTS will work with the state legislature to support the protection and integrity of Maine's Highway Fund.
- BACTS will continue to optimize capacity in the existing system before increasing capacity through road building activities, using TDM and TSM.
- BACTS will investigate ways to leverage federal dollars using an equitable mix of state and local funds.
- BACTS will work to develop and implement a regional transportation process that produces cost savings through regionalization.
- BACTS will work with MaineDOT to seek innovative techniques for transportation projects to extend project life.

## **11.0 Climate Change, Livability, Sustainability and Transportation Operations**

### **11.1 Introduction**

As more scientific evidence supports the climate change phenomenon, various groups in the public and private sectors are paying more attention to its long-term harmful effects on both the natural and human environment. SAFETEA-LU requires Metropolitan Planning Organizations (MPO) to consult with State and local resource agencies when developing long-range statewide or metropolitan transportation plans and to include a discussion of potential activities to mitigate the effects of climate change. The potential to carry out these mitigation activities also needs to be identified.

In regards to livability, the harmful effects of climate change can affect the quality of life, or livability, and sustainability of a local region, state, and community. However, aside from climate change, livability is inclusive of many factors that influence a community and its residents' quality of life. Similarly, sustainable development is closely associated with livability, and the ideals and terms are used interchangeably.

Livable communities are those in which people have multiple, convenient transportation and housing options, as well as destinations that are accessible to people traveling in and out of cars. Livability is improved when various groups coordinate the quality and location of transportation facilities with broader opportunities such as access to good jobs, affordable housing, and quality schools while balancing environmental sustainability.

BACTS' efforts to assist in the management and operations of existing transportation systems are becoming ever more important for several reasons. Travel demand continues to increase and the amount of new infrastructure that can be developed is limited. The worsening of congestion is impacting mobility, the environment and economic productivity, and highlights the need for attention in transportation planning.

### **11.2 Climate Change**

There are two ways of looking at the links between transportation and climate change: how transportation systems affect the climate, and how climate change is likely to influence the various modes of our transportation system.

The climate change that the world is currently experiencing is now generally accepted by experts in the field to be associated with elevated levels of so-called greenhouse gases (GHG). Efforts are underway around the world, to reduce emissions of GHG. However, even if excess GHG emissions were eliminated by the end of the century, climate change would continue, because the elevated levels of GHG would persist for thousands of years, unless further efforts were made to actively "scrub" GHG from the atmosphere.

Transportation is not only a major contributor to GHG emissions, but also will be significantly affected by the results of climate change.

### 11.2.1 National Perspective

Transportation Research Board Report 290 makes the following observations:

#### Climate Change Impacts of Greatest Relevance for U.S. Transportation

- *Increases in very hot days and heat waves.* It is highly likely (greater than 90 percent probability of occurrence) that heat extremes and heat waves will continue to become more intense, longer lasting, and more frequent in most regions during the 21st century. In 2007, for example, the probability of having five summer days at or above 43.3°C (110°F) in Dallas was about 2 percent. In 25 years, this probability increases to 5 percent; in 50 years, to 25 percent; and by 2099, to 90 percent.
- *Increases in Arctic temperatures.* Arctic warming is virtually certain (greater than 99 percent probability of occurrence), as temperature increases are expected to be greatest over land and at most high northern latitudes. As much as 90 percent of the upper layer of permafrost could thaw under more pessimistic emission scenarios. The greatest temperature increases in North America are projected to occur in the winter in northern parts of Alaska and Canada as a result of feedback effects of shortened periods of snow cover. By the end of the 21st century, projected warming could range from as much as 10.0°C (18.0°F) in the winter to as little as 2.0°C (3.6°F) in the summer in the northernmost areas. On an annual mean temperature basis for the rest of North America, projected warming ranges from 3.0°C to 5.0°C (5.4°F to 9.0°F), with smaller values near the coasts.
- *Rising sea levels.* It is virtually certain (greater than 99 percent probability of occurrence) that sea levels will continue to rise in the 21st century as a result of thermal expansion and loss of mass from ice sheets. The projected global range in sea level rise is from 0.18 m (7.1 in.) to 0.59 m (23.2 in.) by 2099, but the rise will not be geographically uniform. The Atlantic and Gulf Coasts should experience a rise near the global mean, the West Coast a slightly lower rise, and the Arctic Coast a rise of only 0.1 m (3.9 in.). These estimates do not include subsidence in the Gulf and uplift along the New England Coast. Nor do the global projections include the full effects of increased melting of the Greenland and Antarctic ice masses because current understanding of these effects is too limited to permit projection of an upper bound on sea level rise.
- *Increases in intense precipitation events.* Intense precipitation events are highly likely (greater than 90 percent probability of occurrence) to become more frequent in widespread areas of the United States.
- *Increases in hurricane intensity.* Increased tropical storm intensities, with larger peak wind speeds and more intense precipitation, are projected as likely (greater than 66 percent probability of occurrence). No robust projections concerning the annual global number of tropical storms have yet emerged from modeling studies,

but more detailed analyses focused on the Atlantic Ocean suggest no significant increases in the annual number of Atlantic tropical storms.

### 11.2.2 Regional Perspective

Based on the national perspective (above), quoted from TRB report 290, and Maine's Climate Future (University of Maine); Maine is likely to be affected by climate change as follows:

There will be a strong trend in Maine toward warmer and generally wetter conditions in all four seasons over the 21st century with the exception of summer precipitation. Projected increases in both temperature and precipitation tend to be greatest in the north, and least along the coast. These warming trends imply a significant shift in the regional hydrology, from a snowmelt-dominated regime to one that shows significant runoff during winter. This shift, coupled with projected precipitation increases in winter, will likely pose challenges for flood mitigation.

#### Vulnerability of Transportation Infrastructure

Although a recent study has evaluated some types of economic impact of sea-level rise for coastal York County (Colgan and Merrill 2008), there has not been a statewide assessment of the impact of climate change on Maine's infrastructure.

Some climate changes will be beneficial for Maine's transportation system; the expected decrease in the length and severity of the winter season will likely reduce the cost of snow and ice control, provide safer travel conditions, and lengthen the construction season. However, depending upon location, roads, bridges, and other transportation infrastructure may become vulnerable to chronic or acute failure. Flooding and erosion associated with major storms may cause road washouts, rendering transportation infrastructure inoperable for long periods of time and requiring unplanned and high-cost replacement and repair (MaineDOT 2008).

#### Reducing GHG Emissions

Efforts to reduce GHG emissions from transportation are essentially the same as those used to address ground level ozone precursors. Notwithstanding the global extent of elevated GHG levels, and the small geographic extent of the BACTS Area; reduction of GHG emissions need to be focused on the reduction of use of GHG generating fuel, and the increased use of alternative fuels that produce less or no GHG.

#### Goals/Objectives/Strategies

The Transportation Research Board of the National Academy of Sciences has made the following recommendations: inventory critical infrastructure such as coastal roads, railways, transit systems, and runways to assess their vulnerability to flooding due to severe storms and sea-level rise; factor anticipated climate change into investment and land-use planning decisions; integrate evacuation and emergency response to extreme



weather events into transportation operations; and develop and implement monitoring technologies to give advance warning of infrastructure failures due to water levels, waves, and wind (TRB 2008).

### 11.3 Livability and Sustainability

Livability is about tying the quality and location of transportation facilities to broader opportunities such as access to good jobs, affordable housing, quality schools, and safe streets. Sustainable transportation provides exceptional mobility and access to meet development needs without compromising the quality of life of future generations. Livability and Sustainability can be addressed together since a strategy for pursuing one will often be appropriate for the other.

BACTS promotes the development of transportation options that support Livability and Sustainability by including non-automobile modes in its evaluation of potential highway projects for the BACTS Transportation Improvement Program (TIP). Through the TIP project evaluation criteria and project scoring, projects that support alternative modes and their integration into the transportation system, score higher and so are more likely to be funded. As an example, a highway project that includes sidewalks, provisions for transit, or bicycling would score additional points, over the same project that did not. In addition, a highway project at a location that already has provisions for alternative modes also gets credit for those modes in its scoring as a potential highway project.

The strategy of implementing Access Management along highway corridors can preserve the highway's capacity so that mobility is not compromised, access to destinations is made safer, and investment in public and private infrastructure is protected. Site access along highways is controlled by local municipal ordinance and the MaineDOT's traffic movement permitting process. BACTS is involved in the latter (meaning the MaineDOT and not the former, right?). However, other than encouraging municipalities to adopt local access management ordinances, BACTS' role is advisory. Some BACTS communities have developed successful access management plans for significant corridors, such as Brewer's Wilson Street.

### 11.4 Transportation Operations

BACTS has recognized for years that traffic congestion occurs more frequently throughout the day and on more roadways than in the past. Funding for major new highway and transit capacity projects is limited, and it often takes years or decades to plan and construct the new infrastructure necessary to reduce this congestion. At the same time, much of the traffic delay on roadways is caused by inefficient or nonexistent traffic control devices, crashes, weather conditions, special events, and other factors that require more immediate solutions and are not solved solely through transportation infrastructure.

BACTS has developed some transportation system management and operations strategies in the planning process designed to optimize the performance of the transportation system. They allow for a more immediate response to traveler concerns than capacity

projects offer while improving the reliability, security, and safety of the multimodal transportation system.

One of these initiatives is the outcome of concerns about quick and efficient response to traffic incidents along the Interstate 95 corridor through Maine. Regional stakeholder groups are being created to bring those involved together to craft regional plans that will address the Incident Management issues in each region in a coordinated and thorough way.

Given the challenges facing the transportation system, the availability of new technologies, and public expectations, BACTS will continue to improve the transportation system management and operations portion of the planning process.

#### 11.5 Future Conditions and Issues

Responding to the challenges of climate change and the establishment of Livable and Sustainable communities requires a long range effort because the challenge will still be there well beyond the lifetime of this particular long range plan. Yet it is possible that strategies can be implemented in the short term that will eventually position the Greater Bangor Area so that it can maintain and improve its economic vitality and livability, while reducing local impacts from climate change. In fact, some immediate factors are already playing a part in adapting the transportation system to meet the challenges. The increasing costs of gasoline and other user costs promote the use of alternatives, as does the ageing of the population. The resulting changes in traveler behavior will exploit existing supportive policies, services and infrastructure, and demand more.

A regular, systematic monitoring of travel demand and the condition of BACTS infrastructure will enable officials to anticipate and plan for impacts to our transportation system resulting from climate change.

#### 11.6 Recommendations

- Survey weather related vulnerabilities of existing infrastructure.
- Develop projects and policies to reduce weather vulnerabilities.
- Incorporate climate vulnerability criteria into project selection, design, specifications.
- Monitor climate effects on infrastructure.
- Promote alternative modes; transit, van pool, carpool, walk, and bike.
- Promote land use policies that are supportive of alternative modes such as Transit Oriented Developments, higher density developments, and mixed use developments.
- Assist with the Bangor region Incident Management group.

## **12.0 Recommendations and Implementation**

The recommendations from each chapter are compiled here and assigned a letter and number relating to time frame and ease of implementation. The likely time frame for implementation is indicated by the letter S for soon (0 to 2 years), M for medium (3-6 years), L for long term (> 6 years), and C for continuous effort required. The ease of implementation is indicated by the number 1 for easy, 2 for moderate, or 3 for difficult and is determined by cost, importance to the transportation system, and political resolve.

### **Public Transit Recommendations:**

- Add service to coastal areas. (L-2)
- Add service to towns around Bangor Area. (M-2)
- Extend service within BACTS, including intermodal links. (M-2)
- Provide evening service. (M-3)
- Provide weekend service: add Saturday for Hampden, Sunday for all routes. (M-3)
- Increase frequencies, particularly Old Town route. (M-2)
- Provide/improve passenger amenities – benches, shelters, landscaping, lighting, walkways, signage, etc. (C-2)
- Improve marketing through local TV, radio, local access channel, and city channel. (S-1)
- Examine cost effective options for providing ADA Complementary Paratransit service, as use of the service increases. (S-1)
- Investigate partnerships with potential large ridership generators, such as colleges, hospitals, and employers. (C-2)
- Implement an ITS-based – traveler information system – next bus arrival, etc. (L-2)
- Implement transit priority at signalized intersections. (L-2)
- Ensure that sidewalks are provided along all bus routes as appropriate. (C-2)
- Investigate opportunities for park & ride in the region. (S-1)
- Study ways of coordinating the public transportation services in the BACTS area, including the siting of an intermodal passenger facility. (C-2)
- Study ways to better integrate taxi service with other transportation options in the Bangor area. (C-2)

### **Highway Network Recommendations:**

#### **Traffic Volume:**

- Advocate for improvements to the I-95 corridor recommended in the recently completed I-95 study. (C-1)
- Continue to advocate for reconstruction of the narrow twin bridges over Stillwater River in Old Town. (L-2)

- Continue to improve capacity and efficiency on Wilson Street (Route 1A) from Acme Road to I-395 in Brewer. (C-2)
- Continue to improve Rt. 1A in Hampden southerly to Rt. 9. (C-1)
- Continue to improve Route 2 in from the Penobscot River Bridge project northerly in Milford. (M-2)
- Continue to improve Route 16 (Bennoch Rd.) in Orono/Old Town from Route 2 to Stillwater Avenue. (L-2)
- Continue to work with Maine DOT to investigate possible safety improvements at the Cedar & Third intersection in Bangor. (C-2)
- Work with Maine DOT to investigate possible safety improvements at both the southern mall entrance and the I-95 ramp intersections on Stillwater Avenue in Bangor. (C-2)
- Advocate for construction improvements to I-95 on/off ramps at Exit 193 in Orono as recommended in previous studies. (L-3)
- BACTS should conduct a study of Union Street in Bangor to address the impact of increased volume and commercial development along the corridor. (M-1)
- Recommendations outlined in recent corridor studies should be implemented as funds become available and as appropriate. (C-2)
- Work to improve cross-town connector roads between major inbound/outbound routes in Bangor such as Burleigh Road and Griffin Road. (C-3)

#### Truck Volume:

- BACTS should continue to advocate for an increased weight limit on Maine's interstate system to reduce heavy truck traffic on our minor arterial and collector roads. (C-1)

#### Traffic Signals:

- BACTS should continue to study signal coordination, phasing/timings along all major corridors in the region. (C-1)
- The Traffic Signal Committee for BACTS should, continue to maintain the equipment inventory, review standardization of equipment and implement a maintenance plan for all signals within the region. (S-1)
- BACTS should conduct a study to review and plan for a central traffic signal operations center. (M-2)

#### Bicycle/ Pedestrian Recommendations:

- Identify high pedestrian or bicycle crash locations and help in the development of information on how to reduce crash rates either by design or education. (S-1)
- Identify and address crosswalk deficiencies at intersections. (C-2)
- Maintain sidewalks and road shoulders throughout the year to minimize safety and accessibility problems. (C-2)
- Add "Share the Road" signage. (M-2)

- Recommend the use of Maine’s interstate funding to improve bicycle and pedestrian mobility at problematic off-ramp locations, such as the Hogan Road overpass. (M-3)
- Add appropriate bicycle and pedestrian accommodations to roadways when undertaking repaving, upgrading, or reconstruction projects. (C-2)
- Build a pedestrian overpass over Main Street in Bangor near the new Arena. (S-3)
- Support regional efforts to create a willing-buyer, willing-seller multi-user path along the old Veazie Railroad bed from Bangor to Orono. (L-2)
- Add sidewalks to existing roadways where either current or latent pedestrian traffic demand exists. (C-2)
- Create wider paved shoulders or bicycle lanes on existing roadways by restriping where there is now adequate pavement width and either current or latent bicycle traffic demand exists. (C-1)
- Upgrade signals at intersections with significant pedestrian traffic to include appropriate pedestrian phases and signalization. (C-1)
- Support “Commute Another Way Week”, “Safe Routes to School” initiatives and “Walk to School/Bike to School” events. (C-1)
- Encourage member municipalities and MaineDOT to routinely provide appropriate accommodations for bicyclists and pedestrians on roadway projects. (C-2)
- Work with Greater Bangor Convention and Visitors Bureau (GBCVB), MaineDOT and others to develop a regional bicycle map to promote more bicycling within the BACTS area and to encourage more tourist economic activity based on bicycling. (S-1)
- Advocate and look for greater funding from a wider array of sources for bicycle and pedestrian transportation improvements at the federal, state, and local level. (C-1)
- Assist communities with funding applications to provide bicycle-pedestrian facilities. (C-1)
- Provide information on successful grant writing for use by member communities. (C-1)
- Encourage installation of more bicycle racks and sidewalk benches, at municipal and business properties particularly in downtown locations, in public gathering spaces, and intermodal facilities. (C-2)
- Provide easy to understand bicycle route signage along regional and local on-road bicycle facilities. (C-2)
- Address the accessibility issues noted in the BACTS Sidewalk Assessment for sidewalks within ¼ mile of a BAT line. (C-2)

Air Transportation Recommendations:

- Promote and support the construction of a major conference center in Bangor which will make BGR more attractive to air service providers. (S-2)

- Explore the feasibility of developing a containerized inland port, or intermodal facility, near BGR or Northern Maine Junction and supported by future port expansion at Searsport. (M-2)
- Conduct a study to determine the feasibility of developing air cargo services at BGR for niche markets such as Maine lobster. (M-2)

#### Rail Transportation Recommendations:

- Transportation, energy, and utility corridors and rights-of-way are a resource that should be preserved for any potential future use or reuse. Unused rights-of-way should be identified so as to prevent a reversion back to abutting landowners thus threatening their use for transportation purposes. (S-1)

#### Marine Transportation Recommendations:

- Support improvements to Mack Point, Searsport such as dredging of the approach channel to the port. Port operations are hampered by shallow water depth requiring deep draft vessels to enter and leave the port facility during high tide. (M-2)
- BACTS should support the City of Bangor in its efforts to encourage deep draft vessel traffic on the Penobscot River by dredging the Penobscot River. (S-1)
- BACTS should encourage MaineDOT to study the feasibility of constructing an intermodal facility at the Bangor waterfront. (M-2)

#### Financial Recommendations:

- BACTS will seek increased funding for construction projects in the BACTS area from any possible funding sources including MaineDOT, FHWA, FTA, Federal delegation high priority projects, research funding sources and grant sources. (C-2)
- BACTS will work with the State legislature to support the protection and integrity of Maine's Highway Fund. (C-1)
- BACTS will continue to optimize capacity to the existing system before increasing capacity through road building activities, using TDM and TSM. (C-1)
- BACTS will investigate ways to leverage federal dollars using an equitable mix of state and local funds. (C-1)
- BACTS will work to develop and implement a regional transportation process that produces cost savings through regionalization. (C-2)
- BACTS will work with MaineDOT to seek innovative techniques for transportation projects to extend project life. (C-2)

Climate Change, Livability, Sustainability and Transportation Operations  
Recommendations:

- Survey weather related vulnerabilities of existing infrastructure. (M-3)
- Develop projects and policies to reduce weather vulnerabilities. (L-3)
- Incorporate climate vulnerability criteria into project selection, design, specifications. (L-2)
- Monitor climate effects on infrastructure. (L-2)
- Promote alternative modes; transit, van pool, carpool, walk, and bike. (S-1)
- Promote land use policies that are supportive of alternative modes such as Transit Oriented Developments, higher density developments, and mixed use developments. (C-1)
- Assist with the Bangor region Incident Management group. (S-1)

**APPENDIX A: BACTS LRP Public Participation Schedule and Public Comments**

**A.1 Schedule of Public Involvement for Long Range Plan**

- Mar. 16, 2009 .....Statement of Intent to BDN and Interested and Affected Parties
- June.18, 2009 .....Multi modal Public Transit Meetings,
- April 21, 2009 .....Kick-off Bicycle/Pedestrian Meeting
- June 16, 2009 .....Second Public Bicycle/Pedestrian Meeting
- June.25, 2009 .....Final Public Bicycle/Pedestrian Meeting
- \*May 25, 2011 .....Draft Plan approved by Policy Committee
- \*May 31, 2011 .....Draft Plan to town offices and posted on website
- \*June 1, 2011 .....Begin draft plan public comment period
- \*June 8, 2011 .....Draft Plan Public Meeting, 7:00 pm, EMDC Boardroom
- \*July 1, 2011 .....End draft plan public comment period
- \*July 19, 2011 .....Final Plan Complete, Presented to Policy Committee for Approval

\* Proposed



## A.2 BACTS LRP Public Comments and Responses

Maine DOT Comments to BACTS Long Range Plan.

Public Transportation under 4.4 Recommendations

- The plan says add service to coast. Where and what?
  - Addressed in that section

Highway Transportation under 5.3 Deficiencies Lack of adequate funding

- In the middle of the paragraph include “economic benefit” to the sentence that says; Some roadways have a higher strategic value than others in terms of traffic volumes, safety, economic benefit and connectivity with other roads within the overall highway network.
  - Added

Highway Transportation under 5.5 Recommendations - Traffic Volumes

- . Last bullet. Would be helpful if that bullet listed what? Corridor studies?
  - Added list of recent BACTS studies in Appendix C

Air Transportation under Section 7.2 Future Trends and Issues

- 3<sup>rd</sup> paragraph – Doesn’t Downeast Trans have runs to Bangor? Ellsworth to Bangor?
  - Currently only runs one trip per day for commuters to the Jackson Lab and one trip per week for shopping. This does not promote intermodal tourism travel.

Financial Issues under 10.2 Future Conditions and Issues

- Limited funding forces prioritization, trend is not likely to change and earmarks might be of the past.
  - Added in last sentence

Marine Transportation, Second Paragraph, first sentence,

- Instead of saying declined significantly, suggested wording could be a limited amount of small concise ship traffic.
  - Removed the word significantly.
- Might want to mention after the first sentence that project cargo is increasing prominently, such as china clay
  - Addressed in 9.1.1 Existing Marine Facilities second paragraph, first sentence.
- And in 2009 Searsport was the 10<sup>th</sup> busiest for the importations of wind turbine components.

- Added

Highway Transportation Bangor I-95 Study - 2<sup>nd</sup> to last bullet could read

- Evaluate future potential for a new interchange north of Hogan Road; and
- Evaluate the future potential of a new northbound on-ramp at the exit 186 interchange
- Change both bullets.

Marine Transportation under Existing Marine Facilities, middle of first paragraph

- The construction of 90,000 square feet of warehousing was done
  - Changed
- Second Paragraph could mention that a new large propane terminal has been proposed for Mack Point and is moving through the permit process.
  - Added
- Also, last Paragraph, suggested tweak could read for several years instead of a few.
  - Added

Rail Transportation under 8.2 Future Trends and Issues

- Add a bullet that says; The MaineDOT has purchased the 231 miles of track from the MMA railroad between Millinocket and Madawaska. MaineDOT will be leasing this track to the Eastern Maine Railroad as an operator and this may result in improved rail service to the Bangor region.
  - Added

Marine Transportation under the Marine Need and Deficiencies

- At the end of the first sentence, could add from its current 35 feet
  - Added

## APPENDIX B: BACTS Highway Classification, Volumes, and TIP Projects

**Table B.1 Federal Functional Classifications**

<b>Town Name</b>	<b>Street Name</b>	<b>Current Federal Functional Classification</b>
Bangor	Broadway	Other principal arterial/Minor arterial
Bangor	Buck St.	Major/urban collector
Bangor	Burleigh Rd.	Major/urban collector
Bangor	Center St.	Major/urban collector
Bangor	Central St.	Other principal arterial
Bangor	Cumberland St.	Major/urban collector
Bangor	Essex St.	Major/urban collector
Bangor	Exchange St.	Major/urban collector
Bangor	Farm Rd.	Major/urban collector
Bangor	Fourteenth St.	Major/urban collector
Bangor	Gallagher Pl.	Other principal arterial
Bangor	Garland St.	Major/urban collector
Bangor	Godfrey Blvd.	Major/urban collector
Bangor	Grandview	Major/urban collector
Bangor	Griffin Rd.	Major/urban collector/Minor arterial
Bangor	Grove St.	Major/urban collector
Bangor	Hammond St.	Other principal arterial/Minor arterial
Bangor	Hancock St.	Major/urban collector/Minor arterial
Bangor	Harlow St.	Major/urban collector/Other principal arterial
Bangor	Hodsdon St.	Other principal arterial
Bangor	Hogan Rd.	Major/urban collector/Minor arterial
Bangor	Howard St.	Major/urban collector
Bangor	Hudson Rd.	Major/urban collector
Bangor	I-395 EB & WB	Principal arterial interstate
Bangor	I-95 NB & SB	Principal arterial interstate
Bangor	Independence St.	Other principal arterial/Minor arterial
Bangor	Industry Spur	Minor arterial
Bangor	Kenduskeag Ave.	Major/urban collector
Bangor	Main St.	Other principal arterial/Minor arterial
Bangor	Maine Ave.	Major/urban collector
Bangor	Mt. Hope Ave.	Major/urban collector
Bangor	N. Park St.	Major/urban collector
Bangor	Oak St.	Other principal arterial

**Table B.1 Federal Functional Classifications (Continued)**

Bangor	Odlin Rd.	Major/urban collector/Minor arterial
Bangor	Ohio St.	Major/urban collector
Bangor	Outer Hammond St.	Minor arterial
Bangor	Park St.	Major/urban collector
Bangor	Perry Rd.	Major/urban collector
Bangor	Pushaw Rd.	Major/urban collector
Bangor	Railroad St.	Other principal arterial
Bangor	Short St.	Other principal arterial
Bangor	State St.	Other principal arterial/Minor arterial
Bangor	Stillwater Ave.	Major/urban collector
Bangor	Summer St.	Other principal arterial
Bangor	Texas Ave	Major/urban collector
Bangor	Thatcher St.	Major/urban collector
Bangor	Union St.	Major/urban collector/Other principal arterial/Minor arterial
Bangor	US Rt. 202	Other principal arterial
Bangor	Valley Ave.	Major/urban collector
Bangor	Vermont Ave.	Major/urban collector
Bangor	Washington St.	Minor arterial
Bangor	Webster Ave.	Major/urban collector
Bradley	Main St.	Major/urban collector
Brewer	Betton St.	Other principal arterial
Brewer	Eastern Ave.	Major/urban collector
Brewer	Elm St.	Major/urban collector
Brewer	I-395 EB & WB	Principal art interstate
Brewer	Mill St.	Major/urban collector
Brewer	No. Main St.	Other principal arterial
Brewer	Parkway South	Major/urban collector/Minor arterial
Brewer	Penobscot Sq.	Other principal arterial
Brewer	Penobscot St..	Other principal arterial
Brewer	Pierce Rd.	Major/urban collector
Brewer	So. Main St.	Minor arterial/Other principal arterial
Brewer	State St.	Minor arterial/Other principal arterial
Brewer	Wilson St.	Other principal arterial
Eddington	Main Rd.	Other principal arterial
Eddington	Riverside Dr.	Major/urban collector

**Table B.1 Federal Functional Classifications (Continued)**

<b>Town Name</b>	<b>Street Name</b>	<b>Current Federal Functional Classification</b>
Hampden	Kennebec Rd.	Major/urban collector
Hampden	Main Rd. North	Minor arterial/Other principal arterial
Hampden	Main Rd. South	Other principal arterial
Hampden	US Rt. 202	Other principal arterial
Hampden	Western Ave.	Other principal arterial/Major/urban collector
Milford	Bradley Rd.	Major/urban collector
Milford	Main Rd.	Minor arterial
Milford	Rt. 178	Major/urban collector
Old Town	Bennoch Rd.	Major/urban collector
Old Town	Center St.	Minor arterial
Old Town	Chester St.	Major/urban collector
Old Town	College Ave.	Minor arterial
Old Town	Gilman Falls Ave.	Major/urban collector
Old Town	No. Brunswick St.	Major/urban collector
Old Town	No. Main St.	Major/urban collector
Old Town	Rt. 116	Major/urban collector
Old Town	So. Main St.	Minor arterial
Old Town	Stillwater Ave.	Minor arterial/Major/urban Collector.
Old Town	Water St.	Major/urban collector
Orono	Bennoch Rd.	Major/urban collector
Orono	College Ave.	Minor arterial
Orono	Forest Ave.	Major/urban collector
Orono	Kelley Rd.	Minor arterial
Orono	Main St.	Minor arterial
Orono	Park St.	Minor arterial
Orono	Stillwater Ave.	Minor arterial
Orono	Woodhaven Rd.	Minor arterial
Orrington	River Rd.	Minor arterial
Veazie	I-95 NB and SB.	Principal arterial interstate
Veazie	Mt. Hope Ave.	Major/urban collector
Veazie	School St.	Major/urban collector
Veazie	State St.	Minor arterial
Veazie	Stillwater Ave.	Major/urban collector

**Table B.2 Traffic Volumes**

<b>Town</b>	<b>Location</b>	<b>Corridor</b>	<b>AADT 2003</b>	<b>AADT 2008</b>	<b>Growth 2003-2008</b>	<b>% Growth 2003-2008</b>
Bangor	Joshua Chamberlain Bridge@ Brewer TL	US1A/SR9	16770	16280	-490	-2.92%
Bangor	Penobscot Bridge @ Brewer TL	BUS 1A	21930	22970	1040	4.74%
Bangor	Broadway SE/O Kenduskeag	Rt. 15	11120	11180	60	0.54%
Bangor	Griffin @ Kenduskeag Stream	Ring	12110	12200	90	0.74%
Bangor	Hammond@ Bangor/Hermon TL	US 2	9960	10320	360	3.61%
Bangor	Hogan N/O I95	Ring	25020	25710	690	2.76%
Bangor	State NE/O Hogan Rd	US 2	4930	5170	240	4.87%
Bangor	Stillwater N/E of Hogan	Stillwater	6420	5340	-1080	-16.82%
Bangor	Union NW/O Davis	Rt. 222	8070	9010	940	11.65%
Bangor	Union NW/O Vermont	Union/Ohio	19170	19730	560	2.92%
Bangor	Union SE/O Charles	Union/Ohio	10340	9910	-430	-4.16%
Bangor	Union SE/O Fourteenth St.	Union/Ohio	12660	11080	-1580	-12.48%
Bangor	Washington SW/O Exchange	CBD	11810	10840	-970	-8.21%
Bre-Orr	Rt.15@ Brewer /Orrington TL	Rt. 15	11410	9140	-2270	-19.89%
Brewer	S. Main St. NO Industrial PKWY Entrance	CBD	16580	13200	-3380	-20.39%
Brewer	SR9/178 N Main St. NE/O Chamberlain St.	SR9/178	15490	12530	-2960	-19.11%
Brewer	US1A Wilson St. @ Holden TL	US1A	23330	20290	-3040	-13.03%
Bradley	SR 178 @ Eddington TL	SR178	3410	3470	60	1.76%

**Table B.2 Traffic Volumes (Continued)**

<b>Town</b>	<b>Location</b>	<b>Corridor</b>	<b>AADT 2003</b>	<b>AADT 2008</b>	<b>Growth 2003-2008</b>	<b>% of Growth 2003-2008</b>
Hampden	US1A S/O Kennebec	US 1A	8670	8720	50	0.58%
Hampden	Western Ave E/O US 202	Western	11040	10880	-160	-1.45%
Hampden	Western W/O Mayo	US 202 Rt. 9	4530	4740	210	4.64%
Milford	SR178 SO US2	SR 178	6800	6220	-580	-8.53%
Milford	US2 SW/O SR 178	US2	15810	13820	-1990	-12.59%
Milford	US2 NO IR 600 County Rd	US2	9220	7780	-1440	-15.62%
Old Town	Center W/O US 2/43	US 2A	13300	11720	-1580	-11.88%
Old Town	Rt. 43 SE/O Bennoch	Rt. 43	5030	4530	-500	-9.94%
Old Town	Stillwater@ Stillwater River	US 2A	20070	17990	-2080	-10.36%
Orono	Park St. NE/O Rangeley Rd.	Kelley	9180	8590	-590	-6.43%
Orono	Park St. NE/O Rangeley Rd.	Rt. 2	10970	10020	-950	-8.66%
Orono	College@ Orono/Old Town TL	US 2A	7160	6160	-1000	-13.97%
Orrington	Rt. 15 SW/O Snows Corner	Rt. 15	7940	6590	-1350	-17.00%
Eddington	SR 9 EO IR 4008 Hill St	RT 9	7110	6230	-880	-12.38%
Veazie	Chase Rd NO O Rt. 2 State St.	Chase	1860	1750	-110	-5.91%
Veazie	Rt. 2 State St NEO School	Rt. 2	7290	5870	-1420	-19.48%

**Table B.3 BACTS Transportation Improvement Projects 2006-2013**

<b>YEAR</b>	<b>PROJECT LOCATION</b>	<b>CATEGORY</b>	<b>SCOPE</b>	<b>TOTAL COST</b>
2012-2013	BANGOR, Hogan Rd and Haskell Rd.	OSI Equipment Only	Install video detection to the existing four leg intersection	<b>\$25,000</b>
2012-2013	BANGOR, Maine Ave Griffin to Godfrey	Rehabilitation	Mill existing pavement to 2" depth and overlaying with 2" of 9.5 MM hot mix asphalt. Existing gravel shoulders are to be graded. Shoulders are to be paved to provide pedestrian access a minimum of 5 ft paved shoulder on one side of road and 2feet of paved shoulder on opposing side. New guardrail and terminal sections are to be provided	<b>\$183,274</b>
2012-2013	BANGOR, Stillwater Ave Home Depot entrance to Bangor Mall Blvd South Entrance	Preservation	Mill existing pavement to 2" depth and overlaying with 2" of 9.5 MM hot mix asphalt. Provide new bituminous curb in front of mall (east side of Stillwater)	<b>\$167,131</b>
2012-2013	BANGOR, Griffin Rd. Kenduskeag to Broadway	Rehabilitation	Shim and overlay of existing pavement. Existing gravel shoulders will be graded and a six foot wide paved shoulder shall be provided on the easterly side of Griffin Rd. to provide pedestrian access. The westerly side shall provide a 2 foot wide paved shoulder	<b>\$326,504</b>
2012-2013	BANGOR, Hogan Rd. I-95 to Bangor Mall Blvd.	Preservation	Milling existing pavement to 2" depth and overlaying with 2" of 9.5 MM hot mix asphalt	<b>\$252,707</b>
2012-2013	BANGOR, Outer Hammond St. Hammond St. Ext to the Town Line	Rehabilitation	Mill existing pavement to 2" depth and overlaying with 2" of 9.5 MM hot mix asphalt. Existing gravel shoulders are to be graded. Shoulders are to be paved to provide 4 ft paved shoulder on each side of roadway. Roadway drainage improvement are to be part of this projects and will include providing underdrain catch basis and storm drains in short section of the roadway to address an ongoing winter icing condition.	<b>\$392,382</b>
2012-2013	BANGOR, Penobscot Bridge Corridor	OSI Equipment only	Install video detection at the intersections of Oak St./Hancock St. and Oak St. /Washington St. and Washington St. and Exchange St.	<b>\$45,000</b>
2012-2013	BANGOR, Union@Hammond	OSI Equipment Only	Provide video detection for intersection, provide new pedestrian signal poles, pedestrian countdown signal heads and push buttons.	<b>\$72,854</b>
2012-2013	BANGOR, Odlin Rd. I-395 to Ammo Park Entrance	Preservation	Mill and fill of Odlin Road from Ammo Park Road to existing railroad track crossing. From the railroad tracks north to the I-395 intersection project includes a 11/4" overlay.	<b>\$190,025</b>
2008-2009	BANGOR, Cumberland Street	Rehabilitation	LAP for structural overlay, beginning at Broadway and extending 0.13 of a mile to Market Street. Reset existing granite curb and provide new granite curb where bituminous curb currently exists. Reconstruct existing sidewalks.	<b>\$205,299</b>



**Table B.3 BACTS Transportation Improvement Projects 2006-2013 (Continued)**

<b>YEAR</b>	<b>PROJECT LOCATION</b>	<b>CATEGORY</b>	<b>SCOPE</b>	<b>TOTAL COST</b>
2008-2009	BANGOR, State@Hancock	OSI Equipment Only	LAP for intersection improvement with signal, at the intersection of State Street and Hancock Street. Provide signal hardware and equipment improvements.	<b>\$174,325</b>
2006-2007	BANGOR, Griffin Road	Preservation	LAP for 2-inch mill and overlay, beginning at Union Street and extending 0.25 of a mile to Maine Avenue.	<b>\$208,800</b>
2010-2011	BANGOR, Broadway@State	OSI Equipment Only	LAP for Intelligent Transportation Systems: Installation of overhead video detection system for an existing traffic signal.	<b>\$20,000</b>
2006-2007	BANGOR, Main Street	Preservation	LAP for ¾" overlay, beginning at Union Street and extending 0.23 mile to Hammond Street.	<b>\$195,000</b>
2008-2009	BANGOR, Ohio Street	Rehabilitation	LAP for 2-inch mill and overlay, beginning at Griffin Road and extending 1.08 miles to Blue Hill West. Scope calls for providing new sidewalk at all existing locations, and new bituminous curb where existing.	<b>\$685,000</b>
2008-2009	BANGOR, Route 1A	OSI	LAP for Intersection reconstruction: Realignment of Main, Cedar and Summer streets.	<b>\$1,286,510</b>
2008-2009	BANGOR, Broadway @ Cumberland	OSI Equipment Only	LAP for intersection improvement with signal at Broadway and Cumberland Street. Replace existing signal.	<b>\$134,900</b>
2010-2011	BANGOR, Hammond Street	Rehabilitation	LAP, pavement mill and overlay: Beginning at Union Street and extending 1.29 miles westerly to the I-95 overpass bridge. Will include work to curbing, sidewalks and catch basins.	<b>\$1,047,715</b>
2010-2011	BANGOR, Hogan Road	OSI Equipment only	LAP for safety improvements for 1.87 miles, from State Street to Stillwater Avenue. Install: 1.) new controller at State Street; 2.) 3,000 feet of signal interconnect wire from State to Mount Hope; and 3.) overhead video detection in the vicinity of the I-95 ramps.	<b>\$29,000</b>
2010-2011	BANGOR, Maine Avenue @ Godfrey	Reconstruction	LAP for construction of a single-lane roundabout with approaches.	<b>\$1,075,000</b>
2006-2007	BREWER Wilson (Green Pt to Wal-Mart)	Reconstruction	Widening road to 5 lanes, with center turn lane.	<b>\$1,495,000</b>
2006-2007	BANGOR, Stillwater Avenue	Rehabilitation	LAP for highway reconstruction, beginning at Longview Street and extending 1.42 miles to the Veazie town line.	<b>\$1,004,849</b>
2008-2009	BANGOR, Broadway @Stillwater	OSI Equipment Only	LAP for intersection improvement with signal. New traffic signal controller and new vehicle detection for existing signalized intersection.	<b>\$35,375</b>

**Table B.3 BACTS Transportation Improvement Projects 2006-2013 (Continued)**

<b>YEAR</b>	<b>PROJECT LOCATION</b>	<b>CATEGORY</b>	<b>SCOPE</b>	<b>TOTAL COST</b>
2012-2013	BREWER South Main St. Harriman Lane to Town Line	Preservation	Mill existing pavement to 2" depth and overlay with 2" of 9.5 MM hot mix asphalt	<b>\$205,868</b>
2012-2013	BREWER State St. and North Main	OSI Equipment Only	Provide video detection for intersection and update pedestrian equipment with countdown signal heads and push buttons and signage. Sidewalk ramps will be improved to meet current ADA standards.	<b>\$47,288</b>
2012-2013	BREWER Wilson and State St.	OSI Equipment Only	Complete traffic signal upgrade including new controller with cabinet, mast arms, foundations, signal heads, pedestrian signal heads and push buttons, video detection, as well as sidewalk and crosswalk improvements	<b>\$195,506</b>
2012-2013	BREWER State St. and Eastern Ave	OSI Equipment Only	Install new video detection and pedestrian signal heads and push buttons at intersection. Improve sidewalk ramps and crosswalks to comply with current ADA and MUTCD Criteria. Provide new ground mounted controller cabinet with concrete foundation.	<b>\$61,191</b>
2012-2013	BREWER Wilson and Main	OSI Equipment Only	Updating pedestrian signal heads to meet ADA and MUTCD criteria including pedestrian countdown heads and ADA compliant push buttons with audible locators and appropriate pedestrian signage. Improvements to sidewalk ramps are also required.	<b>\$33,300</b>
2012-2013	BREWER State and Penobscot	OSI Equipment only	Install new video detection and pedestrian signal heads and push buttons at intersection. Improve sidewalk ramps and crosswalks to comply with ADA and MUTCD Criteria. Provide new ground mounted control cabinet with concrete foundation.	<b>\$55,159</b>
2012-2013	BREWER Wilson and Acme Rd	OSI Equipment Only	Update signal equipment including new signal cabinet with foundation, controller, pedestrian signal heads and push buttons and detection. Improvements to the sidewalks and crosswalks are also included in this project.	<b>\$158,594</b>
2010-2011	BREWER, State Street	Preservation	Pavement mill and overlay: Beginning at Mullen Way and extending 0.24 of one mile to Eastern Avenue. Mill existing pavement to 1½" depth and replace with 3" of new pavement. Install new bituminous curbing along both sides of the roadway.	<b>\$144,945</b>
2010-2011	BREWER, Pierce Road	Preservation	Pavement mill and overlay: Beginning at the Downeast Toyota entrance and extending 0.85 of one mile to Eastern Avenue. Maintain existing pavement width and provide about 1,600 feet of bituminous curb at the southern end of the project.	<b>\$279,500</b>

**Table B.3 BACTS Transportation Improvement Projects 2006-2013 (Continued)**

<b>YEAR</b>	<b>PROJECT LOCATION</b>	<b>CATEGORY</b>	<b>SCOPE</b>	<b>TOTAL COST</b>
2008-2009 Preliminary Engineering  2010-2011 Construction	BREWER, Wilson Street	Reconstruction	Highway reconstruction, preliminary engineering and right-of-way acquisition only: Beginning at Parkway South and extending 0.5 of a mile to Greenpoint Road, where PIN 1307.00 ends. Project ultimately will widen the existing roadway to 5 lanes.	<b>\$1,841,625</b>
2010-2011	BREWER, Wilson Street at Parkway South	OSI Equipment only	Upgrade traffic signals at the intersection, including replacement of mast arm signal supports, new controller cabinet with foundation, overhead video detection, and new pedestrian countdown signal heads.	<b>\$250,000</b>
2008-2009	BREWER, Parkway South	Rehabilitation	Pavement mill and overlay: Beginning at I-395 and extending 0.45 of a mile to Wilson Street. Install new catch basin, reset curbing, and provide larger radii at mall entrance.	<b>\$217,424</b>
2010-2011	BREWER, Parkway South	Rehabilitation	Cross pipe replacement beginning .05 miles south of the intersection of Parkway South and Sunset Strip and extending northerly .01 miles.	<b>\$161,000</b>
	HAMPDEN, Route 1A	Preliminary Engineering	Preliminary Engineering only for reconstruction: Beginning at Route 9 and extending 2.23 miles to a point 0.26 miles north of Wheelden Heights, where PIN 14796.00 ends.	<b>\$200,000</b>
2008-2009	HAMPDEN, Route 1A	Reconstruction	Full-depth reclamation: Beginning 0.26 of a mile north of Wheelden Heights and extending 0.59 of a mile southerly to Hillside Drive.	<b>\$1,400,238</b>
2012-2013	OLD TOWN Stillwater Ave phase II	Reconstruction	Highway reconstruction on Stillwater Avenue/U.S. Route 2A: Total project Begins at College Avenue and extending 1.02 miles to the Abbot St.. This funding is for Phase 2 only.	<b>\$863,318</b>
2008-2009 Preliminary Engineering  2010-2011 Construction	OLD TOWN, Stillwater Avenue PE and Phase 1	Reconstruction	Preliminary engineering and highway reconstruction on Stillwater Avenue/U.S. Route 2A: Total project Begins at College Avenue and extending 1.02 miles to Abbot St. This funding is for Phase 1 only.	<b>\$1,095,274</b>
2012-2013	OLD TOWN, Center St. Water St. to south end of the bridge	Reconstruction	Project to include the removal of existing pavement and reconstruction of gravel base material and pavement to eliminate washboard effect immediately west of the bridge. Reconstruction work to be limited to one side of the road with entire roadway width receiving overlay within limits of work. Existing pavement in interior of the intersection will be milled to provide smooth transition	<b>\$91,307</b>

**Table B.3 BACTS Transportation Improvement Projects 2006-2013 (Continued)**

<b>YEAR</b>	<b>PROJECT LOCATION</b>	<b>CATEGORY</b>	<b>SCOPE</b>	<b>TOTAL COST</b>
2010-2011	ORONO, Bennoch Road	Rehabilitation	LAP for strut replacement, with gravel fill & guardrail replacement: Beginning .04 mile north of the Old Town/Orono line and extending for 0.11 of one mile to .07 mile south of the Old Town-Orono line.	<b>\$320,000</b>
2006-2007	ORONO, Route 2 @ Kelley Road	OSI Equipment Only	Installation of Traffic Signals at the intersection of Route 2 and Kelley Road.	<b>\$104,280</b>
2006-2007	ORONO, Bennoch Road	Reconstruction	Highway Reconstruction: Beginning 0.28 of a mile south of Godfrey Drive and extending southerly 0.63 of a mile to Noyes Drive.	<b>\$1,537,843</b>

**APPENDIX C: List of Transportation Studies Conducted Since the Last LRP**

2006	BACTS Regional Traffic Signal Study
	BACTS Regional Truck Route Study
	Brewer Main Street Study
2009	BACTS Bicycle/Pedestrian Plan Update
	ADA Sidewalk Study
	Capehart Area Safe Routes to School Study
	Urban Transportation Funding Study
	I-95 Corridor Study
Current	Brewer Safe Routes to School Study
	Signal Study Old Town Stillwater Avenue
	Signal Study Bangor Griffin Road
	Signal Study Bangor – Brewer Penobscot River Bridge Corridor

## **APPENDIX D: Glossary of Acronyms**

<b>3-C</b>	Continuing, Cooperative and Comprehensive Planning Process
<b>AADT</b>	Annual Average Daily Traffic
<b>AASHTO</b>	American Association of State Highway and Transportation Officials
<b>ACOE</b>	US Army Corps of Engineers
<b>ADA</b>	Americans with Disabilities Act
<b>ADT</b>	Average Daily Traffic (or Average Daily Trips)
<b>AMPO</b>	Association of Metropolitan Planning Organizations
<b>APA</b>	American Planning Association
<b>AMTRAK</b>	Brand name of National Rail System
<b>APTA</b>	American Public Transportation Association
<b>ATRC</b>	Androscoggin Transportation Resource Center
<b>BACTS</b>	Bangor Area Comprehensive Transportation System
<b>BAQC</b>	Bureau of Air Quality Control
<b>BAT</b>	Brand name of BACTS Regional Transit System
<b>BCM</b>	Bicycle Coalition of Maine
<b>BEP</b>	Board of Environmental Protection
<b>BMP</b>	Best Management Practice
<b>BMS</b>	Bridge Management System
<b>BTIP</b>	Biennial Transportation Improvement Program
<b>BTS</b>	Bureau of Transportation Statistics
<b>BUG</b>	Bicycle User Group
<b>CAA</b>	Clean Air Act
<b>CAAA</b>	Clean Air Act Amendments
<b>CE</b>	Categorical Exclusions
<b>CFR</b>	Code of Federal Regulations
<b>CIP</b>	Capital Improvement Program
<b>CMAQ</b>	Congestion Mitigation and Air Quality Program
<b>CMS</b>	Congestion Management System
<b>COG</b>	Council of Governments
<b>CRF</b>	Critical Rate Factor
<b>DBE</b>	Disadvantaged Business Enterprise
<b>DEIS</b>	Draft Environmental Impact Statement
<b>DEP</b>	Department of Environmental Protection
<b>DOT</b>	Department of Transportation
<b>EA</b>	Environmental Assessment
<b>EIS</b>	Environmental Impact Statement
<b>EJ</b>	Environmental Justice
<b>EPA</b>	Environmental Protection Agency
<b>FAA</b>	Federal Aviation Administration
<b>FEIS</b>	Final Environmental Impact Statement
<b>FFC</b>	Federal Functional Classification
<b>FHWA</b>	Federal Highway Administration
<b>FONSI</b>	Finding of No Significant Impact
<b>FRA</b>	Federal Railroad Administration
<b>FTA</b>	Federal Transit Administration
<b>FY</b>	Fiscal Year
<b>GIS</b>	Geographic Information Systems

**APPENDIX D: Glossary of Acronyms (Continued)**

<b>GPS</b>	Global Positioning Systems
<b>GVW</b>	Gross Vehicle Weight
<b>HOV</b>	High-Occupancy Vehicle
<b>HPMS</b>	Highway Performance Monitoring System
<b>HSR</b>	High-Speed Rail
<b>I/M</b>	Inspection and Maintenance
<b>IHS</b>	Interstate Highway System
<b>IM</b>	Interstate Maintenance
<b>ISTEA</b>	Intermodal Surface Transportation Efficiency Act of 1991
<b>ITS</b>	Intelligent Transportation Systems
<b>JARC</b>	Job Access Reverse Commute
<b>KACTS</b>	Kittery Area Comprehensive Transportation Study
<b>LOS</b>	Level of Service (traffic flow rating)
<b>LRT</b>	Light Rail Transit
<b>LRTP</b>	Long-Range Transportation Plan
<b>M&amp;O</b>	Management and Operations
<b>MaineDOT</b>	Maine Department of Transportation
<b>MIS</b>	Major Investment Study
<b>MOA</b>	Memorandum of Agreement
<b>MOU</b>	Memorandum of Understanding
<b>MPO</b>	Metropolitan Planning Organization
<b>MRSA</b>	Maine Revised Statutes Annotated
<b>MSA</b>	Metropolitan Statistical Area
<b>MSTPA</b>	Maine Sensible Transportation Policy Act
<b>MUTCD</b>	Manual on Uniform Traffic Control Devices
<b>NAA</b>	Non-attainment Area
<b>NAAQS</b>	National Ambient Air Quality Standards
<b>NARC</b>	National Association of Regional Councils
<b>NEPA</b>	National Environmental Policy Act of 1969
<b>NHS</b>	National Highway System
<b>NOW</b>	Neighborhood Organized Walkers
<b>OES</b>	Office of Environmental Services
<b>PACTS</b>	Portland Area Comprehensive Transportation Study
<b>PBCAT</b>	Pedestrian-Bicycle Crash Analysis Tool
<b>PE</b>	Preliminary Engineering
<b>PL</b>	Planning Funds
<b>PV PILOT</b>	Penobscot Valley Prudent Investments Linking Our Towns
<b>RFP</b>	Request for Proposal
<b>ROD</b>	Record of Decision
<b>ROW</b>	Right of Way
<b>RPC</b>	Regional Planning Commission
<b>RR</b>	Railroad
<b>RTAC</b>	Regional Transportation Advisory Committee
<b>SAFETEA-LU</b>	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
<b>SIB</b>	State Infrastructure Bank
<b>SIP</b>	State Implementation Plan

**APPENDIX D: Glossary of Acronyms (Continued)**

<b>SOV</b>	Single-Occupancy Vehicle
<b>SPO</b>	State Planning Office
<b>SPR</b>	State Planning and Research Funds
<b>STIP</b>	State Transportation Improvement Program
<b>STP</b>	Surface Transportation Program
<b>STPP</b>	Surface Transportation Policy Project
<b>TAC</b>	Technical Advisory Committee
<b>TAZ</b>	Traffic Analysis Zone
<b>TCM</b>	Transportation Control Measure
<b>TDM</b>	Transportation Demand Management
<b>TDP</b>	Transit Development Program
<b>TE</b>	Transportation Enhancements
<b>TEA-21</b>	Transportation Equity Act for the 21st Century
<b>TIFIA</b>	Transportation Infrastructure Finance and Innovation Act of 1998
<b>TIP</b>	Transportation Improvement Program
<b>TMA</b>	Transportation Management Area
<b>TMIP</b>	Travel Model Improvement Program
<b>TOD</b>	Transit-Oriented Development
<b>TRB</b>	Transportation Research Board
<b>TSM</b>	Transportation System Management
<b>UGB</b>	Urban Growth Boundary
<b>UPWP</b>	Unified Planning Work Program
<b>URIP</b>	Urban Rural Initiative Program
<b>USC</b>	United States Code
<b>VMT</b>	Vehicle Miles Traveled
<b>VOC</b>	Volatile Organic Compound
<b>VPD</b>	Vehicles Per Day



## APPENDIX E: Definitions

### A

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<b>Alight</b>	The act of getting off a vehicle – commonly applied to transit riders
<b>Area Sources</b>	Small stationary and non-transportation pollution sources that are too small and/or numerous to be included as point sources but may collectively contribute significantly to air pollution (e.g., dry cleaners).
<b>Arterial Street</b>	A class of street serving major traffic movements (high-speed, high volume) for travel between major points.
<b>Attainment Area</b>	An area considered to have air quality that meets or exceeds the U.S. Environmental Protection Agency (EPA) health standards used in the Clean Air Act. Non-attainment areas are areas considered not to have met these standards for designated pollutants. An area may be an attainment area for one pollutant and a non-attainment area for others.

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### C

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<b>Capacity</b>	A transportation facility's ability to accommodate a moving stream of people or vehicles in a given time period.
<b>Capital Program Funds</b>	Financial assistance from the Capital Program of 49 U.S.C. This program enables the Secretary of Transportation to make discretionary capital grants and loans to finance public transportation projects divided among fixed guideway (rail) modernization; construction of new fixed guideway systems and extensions to fixed guideway systems; and replacement, rehabilitation, and purchase of buses and rented equipment, and construction of bus-related facilities.
<b>Carbon Monoxide (CO)</b>	A colorless, odorless, tasteless gas formed in large part by incomplete combustion of fuel. Human activities (i.e., transportation or industrial processes) are largely the source for CO contamination.
<b>Clean Air Act (CAA)</b>	The original Clean Air Act was passed in 1963, but the national air pollution control program is actually based on the 1970 version of the law. The 1990 Clean Air Act Amendments (CAAA) are the most far-reaching revisions of the 1970 law. The 1990 Clean Air Act Amendment is the most recent version of the 1970 version of the law. The 1990 amendments made major changes in the Clean Air Act.
<b>Congestion Management System (CMS)</b>	Systematic process for managing congestion. Provides information on transportation system performance and finds alternative ways to alleviate congestion and enhance the mobility of people and goods, to levels that meet state and local needs.
<b>Congestion Mitigation and Air Quality Improvement Program (CMAQ)</b>	A categorical Federal-aid funding program created with the ISTEA. Directs funding to projects that contribute to meeting national air quality standards. CMAQ funds generally may not be used for projects that result in the construction of new capacity available to SOVs (single-occupant vehicles).

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### D

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<b>Department of Transportation (DOT)</b>	When used alone, indicates U.S. Department of Transportation. In conjunction with a place name, indicates state, city, or county transportation agency (e.g., Illinois DOT, Los Angeles DOT).
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### E

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<b>Emissions Budget</b>	The part of the State Implementation Plan (SIP) that identifies the allowable emissions levels, mandated by the National Ambient Air Quality Standards (NAAQS), for certain pollutants emitted from mobile, stationary, and area sources. The emissions levels are used for meeting emission reduction milestones, attainment, or maintenance demonstrations.
<b>Environmental Justice (EJ)</b>	Environmental justice assures that services and benefits allow for meaningful participation and are fairly distributed to avoid discrimination.

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## APPENDIX E: Definitions (Continued)

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**Environmental Protection Agency (EPA)**

The federal regulatory agency responsible for administering and enforcing federal environmental laws, including the Clean Air Act, the Clean Water Act, the Endangered Species Act, and others.

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## F

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**Federal Highway Administration (FHWA)**

A branch of the U.S. Department of Transportation that administers the Federal-aid Highway Program, providing financial assistance to states to construct and improve highways, urban and rural roads, and bridges. The FHWA also administers the Federal Lands Highway Program, including survey, design, and construction of forest highway system roads, parkways and park roads, Indian reservation roads, defense access roads, and other Federal lands roads.

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**Federal Transit Administration (FTA)**

A branch of the U.S. Department of Transportation that assists communities in developing and improving mass transportation equipment, facilities, techniques, and methods with the cooperation of public and private mass transportation companies. The FTA also assists States and local governments and their authorities in financing area-wide urban mass transportation systems that are to be operated by public or private mass transportation companies as decided by local needs.

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**Financial Planning**

The process of defining and evaluating funding sources, sharing the information, and deciding how to allocate the funds.

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**Financial Programming**

A short-term commitment of funds to specific projects identified in the regional Transportation Improvement Program.

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**Fine Particulates**

Particulate matter less than 2.5 microns in size (PM-2.5). A micron is one millionth of a meter. See "Particulate Matter" below.

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**Formula Capital Grants**

Federal transit funds for transit operators; allocation of funds overseen by FTA.

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## G

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**Geographic Information System (GIS)**

Computerized data management system designed to capture, store, retrieve, analyze, and display geographically referenced information.

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## H

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**Headway**

Time between successive arrivals (or departures) of vehicles – usually applied to fixed-route public transportation

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**High-Occupancy Vehicle (HOV)**

Vehicles carrying two or more people. The number that constitutes an HOV for the purposes of HOV highway lanes may be designated differently by different transportation agencies.

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## I

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**Intelligent Transportation Systems (ITS)**

The application of advanced technologies to improve the efficiency and safety of transportation systems.

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**Intermodal**

The ability to connect, and the connections between, modes of transportation.

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## **APPENDIX E: Definitions (Continued)**

### **Intermodal Surface**

### **Transportation**

### **Efficiency Act of 1991**

### **(ISTEA)**

Legislative initiative by the U.S. Congress that restructured funding for transportation programs; authorized an increased role for regional planning commissions/MPOs in funding decisions; and required comprehensive regional and statewide long-term transportation plans.

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### **Interstate Highway System (IHS)**

The system of highways that connects the principal metropolitan areas, cities, and industrial centers of the United States. Also connects the U.S. to internationally significant routes in Canada and Mexico.

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## **L**

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### **Land Use**

Refers to the manner in which portions of land or the structures on them are used, i.e. commercial, residential, retail, industrial, etc.

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### **Long-Range Transportation Plan (LRTP)**

A document resulting from regional or statewide collaboration and consensus on a region's or state's transportation system, and serving as the defining vision for the region's or state's transportation systems and services. In metropolitan areas, the plan indicates all of the transportation improvements scheduled for funding over the next 20 years.

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## **M**

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### **Maintenance Area**

Maintenance area is any geographic region of the United States previously designated non-attainment pursuant to the CAA Amendments of 1990 and subsequently redesignated to attainment subject to the requirement to develop a maintenance plan under section 175A of the CAA, as amended.

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### **Metropolitan Planning Organization (MPO)**

Regional policy body, required in urbanized areas with populations over 50,000, and designated by local officials and the governor of the state. Responsible in cooperation with the state and other transportation providers for carrying out the metropolitan transportation planning requirements of federal highway and transit legislation.

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### **Metropolitan Transportation Plan (MTP)**

The official intermodal transportation plan that is developed and adopted through the metropolitan transportation planning process for the metropolitan planning area, in accordance with 23 U.S.C. 134, 23 U.S.C. 135 and 49 U.S.C. 5303.

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### **Mobile Source**

Mobile sources include motor vehicles, aircraft, seagoing vessels, and other transportation modes. The mobile source-related pollutants are carbon monoxide (CO), hydrocarbons (HC), nitrogen oxides (NOx), and particulate matter (PM-10 and PM 2.5).

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### **Mode**

A specific form of transportation, such as automobile, subway, bus, rail, or air.

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## **N**

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### **National Ambient Air Quality Standards (NAAQS)**

Federal standards that set allowable concentrations and exposure limits for various pollutants. The EPA developed the standards in response to a requirement of the CAA. Air quality standards have been established for the following six criteria pollutants: ozone (or smog), carbon monoxide, particulate matter, nitrogen dioxide, lead, and sulfur dioxide.

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### **National Environmental Policy Act of 1969 (NEPA)**

Established a national environmental policy requiring that any project using federal funding or requiring federal approval, including transportation projects, examine the effects of proposed and alternative choices on the environment before a federal decision is made.

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### **National ITS Architecture**

A systems framework to guide the planning and deployment of ITS infrastructure. The national ITS architecture is a blueprint for the coordinated development of ITS technologies in the U.S. It is unlikely that any single metropolitan area or state would plan to implement the entire national ITS architecture.

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### **Nonattainment**

A geographic region of the United States that the EPA has designated as not meeting the air quality standards.

## APPENDIX E: Definitions (Continued)

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### O

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<b>Ozone (O3)</b>	Ozone is a colorless gas with a sweet odor. Ozone is not a direct emission from transportation sources. It is a secondary pollutant formed when VOCs and NOx combine in the presence of sunlight. Ozone is associated with smog or haze conditions. Although the ozone in the upper atmosphere protects us from harmful ultraviolet rays, ground-level ozone produces an unhealthy environment in which to live. Ozone is created by human and natural sources.
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### P

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<b>Particulate Matter (PM-10 and PM 2.5)</b>	Particulate matter consists of airborne solid particles and liquid droplets. Particulate matter may be in the form of fly ash, soot, dust, fog, fumes, etc. These particles are classified as "coarse" if they are smaller than 10 microns, or "fine" if they are smaller than 2.5 microns. Coarse airborne particles are produced during grinding operations, or from the physical disturbance of dust by natural air turbulence processes, such as wind. Fine particles can be a by-product of fossil fuel combustion, such as diesel and bus engines. Fine particles can easily reach remote lung areas, and their presence in the lungs is linked to serious respiratory ailments such as asthma, chronic bronchitis, and aggravated coughing. Exposure to these particles may aggravate other medical conditions such as heart disease and emphysema and may cause premature death. In the environment, particulate matter contributes to diminished visibility and particle deposition (soiling).
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<b>Performance Measures</b>	Indicators of how well the transportation system is performing with regard to such things as average speed, reliability of travel, and accident rates. Used as feedback in the decision making process.
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<b>Planning Funds (PL)</b>	Primary source of funding for metropolitan planning designated by the FHWA.
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<b>Public Participation</b>	The active and meaningful involvement of the public in the development of transportation plans and programs.
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### R

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<b>Regional Councils of Government/Planning Organizations</b>	Regional councils of government are multipurpose, multi-jurisdictional, public organizations. Created by local governments to respond to federal and state programs, regional councils bring together participants at multiple levels of government to foster regional cooperation, planning and service delivery. They have a variety of names, ranging from councils of government to planning commissions to development districts.
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### S

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<b>Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA_LU)</b>	Authorized in 2005, SAFETEA-LU authorized federal funding for transportation investment for fiscal 2005-2009. Approximately \$244 billion in funding was authorized, the largest amount in history, which is used for highway, transit, and other surface transportation programs.
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<b>Smart Growth</b>	Smart growth is a set of policies and programs designed by local governments to protect, preserve, and economically develop established communities and natural and cultural resources. Smart growth encompasses a holistic view of development.
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<b>Sources</b>	Refers to the origin of air contaminants. Can be point (coming from a defined site) or non-point (coming from many diffuse sources). Stationary sources include relatively large, fixed facilities such as power plants, chemical process industries, and petroleum refineries. Area sources are small, stationary, non-transportation sources that collectively contribute to air pollution, and include such sources as dry cleaners and bakeries, surface coating operations, home furnaces, and crop burning. Mobile sources include on-road vehicles such as cars, trucks, and buses; and off-road sources such as trains, ships, airplanes, boats, lawnmowers, and construction equipment.
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<b>Sprawl</b>	Urban form that connotatively depicts the movement of people from the central city to the suburbs. Concerns associated with sprawl include loss of farmland and open space due to low-density land development, increased public service costs, and environmental degradation as well as other concerns associated with transportation.
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## APPENDIX E: Definitions (Continued)

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<b>Stakeholders</b>	Individuals and organizations involved in or affected by the transportation planning process. Include federal/state/local officials, MPOs, transit operators, freight companies, shippers, and the general public.
<b>State Implementation Plan (SIP)</b>	Produced by the State environmental agency, not the MPO. A plan mandated by the CAA that contains procedures to monitor, control, maintain, and enforce compliance with the NAAQS. Must be taken into account in the transportation planning process.
<b>State Infrastructure Bank (SIB)</b>	A revolving fund mechanism for financing a wide variety of highway and transit projects through loans and credit enhancement. SIBs are designed to complement traditional Federal-aid highway and transit grants by providing States increased flexibility for financing infrastructure investments.
<b>State Planning and Research Funds (SPR)</b>	Primary source of funding for statewide long-range planning.
<b>State Transportation Improvement Program (STIP)</b>	A staged, multi-year, statewide, intermodal program of transportation projects, consistent with the statewide transportation plan and planning processes as well as metropolitan plans, TIPs, and processes.
<b>Statewide Transportation Plan</b>	The official statewide intermodal transportation plan that is developed through the statewide transportation planning process.
<b>Stationary Source</b>	Relatively large, fixed sources of emissions (i.e., power plants, chemical process industries, petroleum refining and petrochemical operations, or wood processing).
<b>Surface Transportation Program (STP)</b>	Federal-aid highway funding program that funds a broad range of surface transportation capital needs, including many roads, transit, sea and airport access, vanpool, bike, and pedestrian facilities.
<b>T</b>	
<b>Telecommuting</b>	Communicating electronically (by telephone, computer, fax, etc.) with an office, either from home or from another site, instead of traveling to it physically.
<b>Title VI</b>	Title VI of the Civil Rights Act of 1964. Prohibits discrimination in any program receiving federal assistance.
<b>Transportation Conformity</b>	Process to assess the compliance of any transportation plan, program, or project with air quality implementation plans. The conformity process is defined by the Clean Air Act.
<b>Transportation Control Measures (TCM)</b>	Transportation strategies that affect traffic patterns or reduce vehicle use to reduce air pollutant emissions. These may include HOV lanes, provision of bicycle facilities, ridesharing, telecommuting, etc. Such actions may be included in a SIP if needed to demonstrate attainment of the NAAQS.
<b>Transportation Demand Management (TDM)</b>	Programs designed to reduce demand for transportation through various means, such as the use of transit and of alternative work hours.
<b>Transportation Equity Act for the 21st Century (TEA-21)</b>	Authorized in 1998, TEA-21 authorized federal funding for transportation investment for fiscal 1998-2003. Approximately \$217 billion in funding was authorized, the largest amount in history, which is used for highway, transit, and other surface transportation programs.

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**APPENDIX E: Definitions (Continued)**

**Transportation**

**Improvement Program**

**(TIP)**

A document prepared by a metropolitan planning organization that lists projects to be funded with FHWA/FTA funds for the next one-to-three-year period.

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**Transportation**

**Infrastructure Finance**

**and Innovation Act of**

**1998 (TIFIA)**

A federal credit program under which the DOT may provide three forms of credit assistance - secured (direct) loans, loan guarantees, and standby lines of credit - for surface transportation projects of national or regional significance. The fundamental goal is to leverage federal funds by attracting substantial private and non-federal co-investment in critical improvements to the nation's surface transportation system.

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**Transportation**

**Management Area**

**(TMA)**

All urbanized areas over 200,000 in population, and any other area that requests such designation.

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**Trust Fund**

A fund credited with receipts that are held in trust by the government and earmarked by law for use in carrying out specific purposes and programs in accordance with an agreement or a statute.

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**U**

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**Unified Planning Work**

**Program (UPWP)**

The management plan for the (metropolitan) planning program. Its purpose is to coordinate the planning activities of all participants in the planning process.

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**Urbanized Area**

Area that contains a city of 50,000 or more population plus incorporated surrounding areas meeting size or density criteria as defined by the U.S. Census.