

APPENDIX G

TRANSPORTATION INVENTORY

INTRODUCTION

Roads, streets, and the means of transportation are often referred to as the *City's circulation system*. This system is necessary to move people, goods, and services from one part of the City to another, into and out of the City, and through the City. The street system also provides access to private property and is the framework on which the City is built. In addition to these functions, the street system is the setting from which we view the rest of the City: the historic homes and other historic buildings, the Kennebec River, open fields, the downtown, and the various places where people live, work, and play. These features form the visual impressions of our community. The efficiency of our City, the value of private property, and how we view and experience our surroundings are all affected by the City's streets. However, the various tasks we expect our streets to perform often conflict with one another. How well streets perform these conflicting tasks frequently determines how well we enjoy our community.

BATH, A MULTIMODAL TRANSPORTATION HUB

The City of Bath's Kennebec River location and transportation assets make it uniquely positioned to become a multimodal passenger transportation hub in the Midcoast Region. It has great potential for high-quality highway, rail (both passenger and freight), bus (both intercity and local), bicycle and pedestrian, and passenger-ferry transportation services. This critical mass of services can greatly enhance transportation access in the region and also significantly positions Bath to become more of a tourist and visitor destination.

The rehabilitation of the Bath Railroad Station, completed in 2007, provides an opportunity to capitalize on this transportation hub. The station houses an office of Maine Eastern Railroad and the Regional Chamber of Commerce-operated Tourist Information Center. Ticketing for Maine Eastern Railroad's excursion trains that run between Rockland and Brunswick, stopping in Bath, is done from the station.

ROADWAYS

Route 1

Bath is a gateway community to Midcoast Maine and a crossroads for visitors accessing coastal communities to the south in Arrowsic, Georgetown, and Phippsburg. As such, Bath has heavy seasonal variations in traffic. Route 1, classified as a Principal Arterial Expressway, has increases in traffic of more than 30 percent during the summer months over average daily traffic (AADT) volumes.

Concerns related to the Route 1 corridor through Bath are well documented in the recently completed "Route 1 Corridor Feasibility Study" (MaineDOT, 2005) that defined options for expansion, replacement, or rehabilitation of the elevated portion of Route 1—the viaduct—through the center of the City. The study also looked at the land-use and transportation connection and at image issues associated with the Route 1 portion west of High Street.

According to the MaineDOT study:

The current configuration of the Route 1 corridor in Bath presents numerous issues for the City:

- Route 1's design west of High Street presents a poor "gateway image" to the City, is not representative of the rest of Bath, provides poor vehicular and pedestrian connectivity between the north end and the south end in that portion of the City, and discourages drivers from obeying the 35 mph speed limit (studies by the Bath Police Department indicate that the average speed of the traffic is greater than the posted speed of 35 mph and during the studies there were a number of vehicles traveling at greater than 50 mph), has poor access management, and has a number of High Crash Locations along it or associated with it.
- The design of the Route 1 viaduct through the downtown has poor aesthetics and, while actually offering a link north and south under Route 1, creates a visual barrier and perhaps a psychological barrier between the north and south ends of the City.
- The capacity of the road is routinely exceeded during the summer weekend days, especially Friday evenings.
- Traffic operations at the at-grade intersections under the viaduct are poor due to the "dead time" created in the traffic signal timing caused by the large size of the intersections.
- Accessibility from the south into the downtown is poor because of the location of exits from Route 1 that bring motorists down under the viaduct or to High Street, and is compounded by the poor gateway image west of High Street and poor highway signage northbound.

The "Route 1 Corridor Feasibility Study" forecasts that traffic on Route 1 will continue to increase substantially by 2030. Summer peak-hour traffic is forecast to increase by approximately 50 percent west of High Street, by more than 50 percent on the two-lane (i.e., one lane in each direction) viaduct, and by about 50 percent on the Sagadahoc Bridge.

The local committee chosen by the City Council to work with the MaineDOT and its consultant on the "Route 1 Corridor Feasibility Study" reviewed various future options for the viaduct: removal, replacement with a new four-lane structure, and replacement with a below-grade four-lane alternative. The committee voted that replacing the existing viaduct with a new four-lane viaduct was the alternative that best met the study's agreed-to criteria. However, because of funding considerations and a more detailed structural review of the viaduct, the MaineDOT decided to postpone the project for fifteen to twenty years. The committee expressed its intention to pursue changes to the portion of Route 1 west of High Street that would improve the highway's gateway image and reduce the number of curb cuts.

In April and May of 2007, the viaduct was closed for a four-week period while the bituminous surface and a portion of the concrete below it was removed and replaced with a new concrete surface. This replacement was done to extend the life of the viaduct for fifteen to twenty years. As a result of extensive planning, downtown route changes, Bath Police Officers on-site to direct and enforce traffic regulations, and time of the year, the closure caused minimal disturbance in the downtown.

Traffic conditions on Route 1 have improved significantly since the opening of the Sagadahoc Bridge in 2000. The new bridge created a dedicated access lane northbound onto the bridge from Leeman Highway, thus allowing a free flow of traffic onto the bridge instead of requiring a merge into a single traffic lane. This has been especially important during the BIW afternoon-shift change. Traffic congestion that used to last up to 3 hours on Friday afternoons in the summer is now almost nonexistent.

From a regional perspective, long-term planning for Route 1 in the Midcoast Region is the Gateway 1 process, which is a transportation and land-use

planning process for the corridor from Brunswick to Prospect. The City of Bath has representatives actively involved with this process.

Local Streets

The other major concern with our roadway network is the incompatibility of traffic on specific neighborhood streets. High Street south of Route 1 (i.e., Route 209) provides access from Route 1 to South End neighborhoods as well as to Phippsburg and the Popham Beach area. Due to its current narrow width, curves, and houses located close to the road, High Street is unable to handle further increases in traffic; the traffic is impacting quality of life for neighborhood residents.

Speeding and cut-through traffic on several City streets have also become major concerns in recent years. Richardson Street, Western Avenue, and Court Street are local streets used as cut-throughs to and from Route 1 and/or West Bath. Granite, Union, South, and Bath Streets are used by commuters to and from BIW.

Route 209 Bypass

Since the 1980s, a so-called Route 209 Bypass has been considered. This new roadway (if built) would result in the creation of a street from Route 1 (near the Congress Avenue interchange), across (and connecting with) High Street near Nichols Street, and then to Washington Street near Castine Street. The bypass, it is assumed, would facilitate the movement of vehicles between Route 1 and Phippsburg as well as BIW. Shorter versions and a longer version of the bypass have been considered. One concept would simply connect Route 1 to High Street, easing congestion on part of High Street. Another concept would only connect Washington Street to High Street, helping to keep BIW commuter traffic off the narrow local streets between High and Washington. The longer version would take traffic all the way to a location on High Street near Winnegance. The High Street to Route 1 portion of this concept (1.3 miles) would mostly traverse The Hyde School property. The High to Washington portion (about 1,300 feet) would traverse Central Maine Power (CMP) property or abut its right-of-way. The longer version would traverse The Hyde School property, a capped special waste landfill owed by BIW, and numerous other privately owned properties.

"The Route 1 Corridor Feasibility Study" considered whether constructing the Route 209 Bypass would be an effective measure in changing the needs of Route 1. That is, would it eliminate or postpone the need to widen the two-lane section of Route 1? It was determined that the bypass would have only limited benefit to Route 1; therefore, the MaineDOT could not justify building the bypass as a Route 1 improvement. The report also stated that any plan to build the bypass would have to be judged exclusively as a non-Route 1 traffic improvement.

New-Street Construction Standards

New streets in Bath are required to be safe enough for the volume of traffic expected and proposed locations, and the standards encourage street and utility connectivity. The standards also address street widths by allowing urban-scale streets, often narrower than those suggested for new suburban locations. The City of Bath PWD Street Handbook dictates construction practices required of contractors.

FUNCTIONAL CLASSIFICATION OF ROADS AND STREETS

As stated in the introduction to this appendix, roads and streets serve many functions, including carrying high-speed traffic through the City and people to and from their home. The functional classification of a road or street is a reflection of the street's role in providing transportation mobility or access to property or some role in between. The Federal Highway Administration classifies roads and streets according to their function, as follows:

- *Principal Arterial Freeways* (partial control-of-access) and *Principal Arterial Expressways* (full control-of-access) are highways that serve through-traffic and major circulation movements within federally defined Urban Areas. In Bath, Route 1 and Leeman Highway are classified as Principal Arterial Freeways and Expressways.
- *Other Principal Arterials* are highways that provide long-distance connections but do not fit the Principal Arterial Freeway or Expressway category. The on- and off-ramps to Route 1 have this classification.
- *Minor Arterials* are roadways within a federally designated Urban Area that interconnect with and supplement the urban principal arterial system. They distribute travel to geographic areas smaller

than those of higher classified roadways. There are no Minor Arterials in Bath.

- *Major Urban Collectors* provide both land access and traffic circulation within urban residential neighborhoods and commercial and industrial areas in federally designated Urban Areas. In Bath, the Major Urban Collectors are as follows:

- | | |
|--|--|
| o High Street from Phippsburg and West Bath to Park Street | o Front Street from Vine Street to Summer Street |
| o Park Street | o Vine Street |
| o Webber Avenue | o Commercial Street |
| o Washington Street from Webber Avenue to Park Street | o Oak Street from Commercial Street to High Street |
| o South Street | o North Street from Washington Street to Congress Avenue |
| o Richardson Street | o Congress Avenue |
| o State Road | o Lincoln Street |
| o Court Street | o Old Brunswick Road from Five Corners to the railroad underpass |
| o Centre Street | o Oak Grove Avenue |
| o King Street | o Crawford Drive |
| o Water Street | o Denny Road |
| o Elm Street | |
| o Summer Street | |

- *Minor Collectors* link locally important traffic generators to the arterial system. Old Brunswick Road from the railroad underpass to the Brunswick town line is in this classification.
- *Local roads* are everything else.

This information is important when planning major improvements to these streets. The functional classification of a street requires certain design requirements (e.g., width). This information is shown on the Functional Classification Map.

ROADWAY MAINTENANCE RESPONSIBILITY

Some of the roads and streets in Bath are the responsibility of the State, some are the responsibility of the City, and some are shared by both. According to the MaineDOT web site, "the State Highway System is grouped into three categories [for maintenance responsibility]:

State Highways form a system of connected routes throughout the state that primarily serve intra- and inter-state traffic. With the exception of compact

areas, the MaineDOT has responsibility for the year-round maintenance of state highways. The State Highway category generally corresponds with the federal 'arterial' classification.

State Aid Highways connect local roads to the State Highway System and generally serve intracounty rather than intrastate traffic movement. With the exception of compact areas, state aid roads are usually maintained by MaineDOT in the summer and by the municipalities in the winter. The State Aid Highway category generally corresponds with the federal 'collector' classification.

Townways are all other highways not included in the State Highway or State Aid Highway classifications that are maintained by municipalities or counties. These roads are classified as federal 'local' roads."

- The only State Highway in Bath is Route 1-Leeman Highway.
- The State Aid Highways are as follows:
 - High Street from Bridge Street and the West Bath town line to North Street
 - Bridge Street
 - Old Brunswick Road
 - Centre Street from Lincoln Street to Washington Street
 - Commercial Street
 - Congress Avenue
 - Elm Street
 - Front Street from Vine Street to Elm Street
 - Lincoln Street
 - North Street from 5 Corners to Washington Street
 - Oak Grove Avenue from Old -Brunswick Road to 5 Corners
 - Oak Street from Commercial Street to Washington Street
 - Richardson Street
 - Vine Street
 - Washington Street from Webber Avenue to North Street
 - Webber Avenue
 - Water Street
- The other streets in Bath are considered Townways.

When planning and budgeting maintenance, as well as major improvements to these streets, this information is important. The City of Bath passed a street bond in 2006. That money is being used for a multi-year improvement program to improve local streets. In addition, URIP funds are used on State-Aids roads that require capital improvements. These improvements are done annually. When the street bond is completed the City will revert to yearly operational funds that only allow limited improvements. The responsibility—City of Bath or MaineDOT—is shown on the Roadway Maintenance Responsibility Map.

TRAFFIC COUNTS

Knowing the volume of traffic a road or street carries reveals much about the importance of that roadway and the impact it will have on the neighborhoods through which it passes. The MaineDOT conducts periodic traffic counts in various Bath locations. Route 1 has the highest traffic counts. State Road and Congress Avenue have the next highest counts, followed by High Street (south of Route 1), and Washington Street in the downtown.

Traffic counts are shown in the following table as AADT for 2002 and 2005 at locations with AADT counts more than 3,000 vehicles.

BATH TRAFFIC COUNTS 2002 AND 2005

LOCATION	2002 AADT	2005 AADT
US 1 (Sagadahoc Bridge) @ Woolwich Town Line	28,140	26,630
US 1 (Leeman Highway) (EB) W/O Quimby Street	16,630	17,350
US 1 (Leeman Highway) (WB) W/O Quimby Street	17,760	17,250
State Rd NE/O Congress Avenue	10,510	9,920
Congress Avenue N/O State Road	10,680	9,640
State Road SW/O Congress Avenue @West Bath Town Line	9,920	9,160
SR 209 (High Street) S/O Granite Street	9,560	8,730
SR 209 (High Street) N/O South Street	9,460	8,630
SR 209 (High Street) S/O Pine Street	7,220	7,180
Washington Street S/O Leeman Highway (EB)	7,130	7,180
Washington Street S/O Centre Street	NC	7,080
SR 209 (High Street) NE/O SR 209 (Bridge Street)	7,130	6,740
Congress Avenue W/O Lincoln Street	7,600	6,640
Washington Street S/O Union Street	6,430	6,640
Centre Street W/O Washington Street	6,920	6,570
Washington Street S/O Russell Street	6,210	5,630
SR 209 (Bridge Street) SE/O SR 209 (High Street)	5,330	4,880
Centre Street E/O High Street	4,840	4,840
Washington Street S/O North Street	4,860	4,720
Washington Street N/O North Street	4,560	4,620
US 1 (EB) on ramp to Carleton Bridge E/O Water Street	4,670	4,590
Chandler Drive E/O Congress Avenue	5,270	4,590
Leeman Highway (EB) W/O Middle Street	4,710	4,570

Leeman Highway (WB) W/O Middle Street	4,980	4,530
Washington Street N/O Centre Street	4,790	4,260
Centre Street E/O Washington Street	NC	4,210
Court Street SW/O High Street	NC	3,770
Ramp to US 1 (Leeman Highway) (WB) W/O High Street	4,190	3,730
Leeman Highway (WB) W/O Washington Street	NC	3,520
Court Street E/O Floral Street	3,710	3,400
Front Street N/O Vine Street	3,910	3,300
Ramp from US 1 (Leeman Highway) (EB) W/O High Street	3,290	3,090
Washington Street S/O Bowery Street	2,770	3,040
Centre Street W/O Lincoln Street	3,130	2,950
Leeman Highway (EB) W/O Washington Street	5,040	NC

Note: NC means no count that year.

Source: MaineDOT, 2006 Transportation Count Book

These counts reflect traffic generated by through-traffic on Route 1, traffic heading to Route 1 (much of it BIW commuters), traffic to Phippsburg and the Popham Beach area, and traffic in and around the downtown.

HIGH CRASH LOCATIONS

The MaineDOT analyzes intersections and roadway segments to determine how unsafe they are. Any intersection or roadway segment that has had eight accidents in a three-year period and has a Critical Rate Factor (CRF) of more than 1.0 is considered a High Crash Location (HCL). (The CRF is calculated by the MaineDOT based on the volume of traffic, geometrics of the intersection or roadway segment, and number of crashes. A number more than 1.0 indicates more crashes than would be expected.) HCLs for 2002 through 2004 and 2004 through 2006 are summarized in the following table. The data indicate potentially serious crash problems at several locations along or leading to Route 1, as well as at two locations on Centre Street.

BATH HIGH CRASH LOCATIONS 2002-2004 and 2004-2006

Locations	2002-2004		2004-2006	
	Total Accidents	Critical Rate Factor	Total Accidents	Critical Rate Factor
1. Route 1 & Leeman Highway	24	6.07	13	3.74
2. Centre Street & High Street	25	4.51	12	2.85

3. Route 1 NB & State Road	17	3.56	13	6.36
4. Route 1 SB & Leeman Highway SB	16	3.31	17	4.05
5. High St on-ramp to Route 1 SB	11	2.00	8	1.90
6. Congress Avenue & State Road	9	1.34	9	5.33
7. Centre Street & Middle Street	11	2.10	--	--

Source: MaineDOT, 2007

BRIDGES

Most of the bridges in the City of Bath are the responsibility of the MaineDOT to maintain and replace them whenever necessary. The following table shows the inventory of bridges in Bath. Sewall's Farm Bridge, located in one of the City's cemeteries, was removed recently because it was unsafe; it was replaced in 2008.

BATH BRIDGE INVENTORY

Name & Location	Type	Year Built	Length (feet)	Capital & Maintenance Responsibility	Condition
Sagadahoc Bridge, Route 1 over Kennebec River	Pre-cast concrete box girder	1997	2,952	MaineDOT	Very Good
Carleton Bridge, RR tracks over Kennebec River	Steel truss	1926	3,098	MaineDOT	Fair
Paul Davis Memorial, High Street over Route 1	Concrete, rigid frame	1947	123	MaineDOT	Fair
West Approach (Viaduct)	Steel girder	1958	1,288	MaineDOT	Fair
New Meadows #2, Old Brunswick Road over New Meadows River	Steel girder	1918	58	MaineDOT	Fair
Sewall Bridge, Old Brunswick Road over Whiskeag Creek	Steel culvert	1993	11	MaineDOT	Good
Congress Avenue over Route 1	Steel girder	1966	179	MaineDOT	Good
Winter Street Bridge over RR tracks	Concrete slab	1996	28	MaineDOT	Good
Oak Street Bridge over RR tracks	Pre-cast concrete slab	1994	31	MaineDOT	Very Good

High Street Bridge over RR tracks	Pre-cast concrete slab	2006	39	MaineDOT	Good
Oak Grove Avenue Bridge over RR tracks	Pre-cast concrete slab	1999	47	MaineDOT	Very Good
Whiskeag Bridge, Whiskeag Road over Whiskeag Creek	Aluminum rigid frame	1999	21	MaineDOT	Very Good
Sewall's Farm Bridge over RR tracks	Steel Truss	2008	38	City of Bath	Excellent

Sources: MaineDOT and City of Bath, 2008.

VEHICLE AVAILABILITY, MODE TO WORK, AND COMMUTE TIME

On the roads and streets, as part of the traffic, across the bridges, and through some of the HCLs, Bath residents drive their vehicles. According to the U.S. Census Bureau, in 2000 only about 9 percent of Bath households did not own a vehicle. Approximately 43 percent of households owned one vehicle, 38 percent owned two, and 10 percent owned more than two.

About 70 percent of Bath workers drove alone to work, which is lower than the state percentage of about 80 percent.

Compared with the state, Bath had the highest percentage of workers who walked to work (i.e., 11 percent). Also, Bath workers spent less time than workers in the rest of the state commuting to work; the majority—more than 80 percent—spent less than 25 minutes to get to work. Almost a quarter of Bath workers (i.e., 23 percent) spent between 5 and 9 minutes commuting, which compares to 14 percent for the state.

SIDEWALKS AND TRAILS

Because it is such a dense, urban community, the City of Bath has a good system of sidewalks in the downtown. There is a plan to link residential neighborhoods to destination locations such as schools, recreation facilities, and the Bath Area Family YMCA.

The City's Ordinances Codes require property owners or tenants to clear downtown sidewalks of snow and ice within 4 hours after a storm ends. If the sidewalk is not cleared, the property owner or tenant is subject to a fine. The Bath PWD clears snow from sidewalks leading to schools and other sidewalks, as time permits.

RAIL

Another important mode of transportation in the City of Bath is the railroad. Bath is served by the Rockland Branch rail line, which connects Brunswick to Rockland and points in between. This rail line is owned by the State of Maine and operated by Maine Eastern Railroad, which is owned by Morristown and Erie Railway, Inc. The Rockland Branch rail line recently had approximately \$30 million of rehabilitation, repair, and upgrade of tracks, bridges, and grade crossings. According to the "Portland North Service Extension: Business Plan" (VHB, 2003), an additional \$4 million in capital investments in passenger rail stations is planned. The \$1.3 million rehabilitation of the Bath Railroad Station, completed in June 2007, was one of those investments. The station still lacks parking and safety improvements (slated for 2009) and the construction of a permanent railcar boarding platform.

Maine Eastern Railroad hauls freight through Bath and also operates the Coastal Maine Scenic Passenger Train between Brunswick and Rockland in the summer. The train stops in Bath four times a day Wednesday through Saturday, with two additional stops on Sundays.

According to the MaineDOT's "Route One Corridor Feasibility Study," two other types of passenger rail service are being considered for the Rockland Branch through Bath: (1) connecting the planned extension of Amtrak service to Brunswick, to Rockland via Bath; and (2) commuter rail service to BIW. The "Rail Station with Park and Ride Lot: Site Evaluation Study" for the MaineDOT about Park and Ride Lots that may be needed to complement commuter rail service to BIW estimated a reasonable potential for a 20 percent market share of the 600 day-shift workers originating east of the Kennebec River for this service (Stafford Business Advisors, 2002). The 20 percent share would translate to 120 BIW workers potentially using this rail service.

The "Explore Maine" initiative of the MaineDOT (i.e., the implementation program of the 1997 "Strategic Passenger Transportation Plan") envisions a statewide passenger rail system (and other complementary transportation networks such as passenger ferry, intercity bus, and shared-use paths) implemented during a twenty-year-plus time frame. Highest priority service is scheduled to commence in areas that would positively impact the Route 1 corridor through the Midcoast Region.

As discussed previously, Maine Eastern Railroad also hauls freight through Bath. The primary customer on the line is Dragon Cement in Thomaston—New England's only cement manufacturer.

South of the tracks (i.e., across the tracks from the Bath Railroad Station), along the north property line of BIW, is a 1.3-acre parcel of land owned by the City. A rail spur runs along the north side of this parcel. Although the land is currently leased by the City to BIW for parking, if there were a need, it could be a small freight transfer site.

PUBLIC TRANSIT

The Bath CityBus is a City-operated, fixed-route transit service. The CityBus operates on weekdays from 7:30 a.m. to 5:30 p.m. and covers most of the urban portion of Bath with a figure-eight, two-loop route. The service carries approximately 10,000 riders per year. Morning and afternoon commuter runs that coordinate with BIW's day-shift changes are also provided by the CityBus. The CityBus is funded with financial assistance from the MaineDOT (actually, Federal Transit Administration funds), the City of Bath's annual budget, and the \$1-fares paid by the riders.

The City is served by a so-called demand-response bus service operated by Coastal Trans, Inc. (a non-profit corporation formed by the Methodist Conference Home, Inc.), which serves clients who call ahead for rides. It serves mostly Medicare and Medicaid clients in Knox, Lincoln, and Sagadahoc Counties and the towns of Brunswick and Harpswell.

Concord Trailways operates regularly scheduled, intercity bus service on its Maine Coastal Route, which connects Bath to both Bangor and the University of Maine in Orono to the north and Portland, Boston, and Logan Airport to

the south. There are two daily stops in Bath for both northbound and southbound customers, plus an extra Sunday southbound stop. Concord Trailways currently uses a business located at the Coastal Plaza on State Road for arriving and departing passengers.

During the summer months and the winter holiday season, a trolley operates in Bath primarily for tourists and other sightseers. The trolley is owned by the City and from 1999 to 2007 was operated by the Bath Trolley Company, a non-profit corporation established solely for that purpose. Since the autumn of 2007, the trolley has been operated by the Bath Transportation Commission, a corporation formed by the City Council to operate the newly restored Bath Railroad Station and the Bath Trolley Company and to provide advice on the operation of the Bath CityBus.

BIW BUSES AND VANS

Several buses and vans transport BIW commuters to and from work. Coastal Trans, Inc., has a bus from the Gardiner area and BOMAR, Inc., operates five buses under a contract with BIW to serve its Park and Ride Lots. Also, thirty-eight twelve- or fifteen-passenger vans carry BIW commuters. The Regional Transportation Program in Portland operates some of the vans and BIW employees operate others. The only support that BIW provides to the vanpooling program is free parking.

THE MARINE HIGHWAY

Passenger Ferry

According to the "Route One Corridor Feasibility Study," passenger ferry service is a major component of the MaineDOT's "Explore Maine" initiative. The program envisions a multi-tiered network of intercoastal ferry service with some supporting intracoastal service (i.e., upriver connections on the Kennebec River to Augusta and the Penobscot River to Bangor). Portland, Rockland, and Bar Harbor would anchor the network and be the primary destinations for travelers. Other planned intercoastal hubs include Bath, Boothbay Harbor, Belfast, Bass Harbor, and Eastport.

The "Maine Strategic Passenger Plan" (Wilbur Smith Associates, July 1997) identified "new seasonal tourists and visitors" as the most likely market for ferry services. The Plan suggests that 25 to 33 percent of the potential

90,000 new annual visitors in this group could be attracted to ferry service. It also suggests that a smaller percentage (i.e., 5 to 10 percent) of the larger pool of "current seasonal residents and visitors" could be attracted to the service. One of the main objectives of these services is to reduce tourist traffic along the Route 1-Midcoast Maine corridor. The services would provide seamless transfers from other modes in the corridor, such as intercity bus and passenger rail.

Currently (i.e., as of 2008), Long Reach Cruises operates the 50-foot, sixty-four-passenger *Sagadahoc* from Maine Maritime Museum. The *Sagadahoc* takes passengers on boat rides, sightseeing tours, and nature cruises on the Kennebec River, into Merrymeeting Bay, and along the shore in the Midcoast Region.

Other Marine Highway Inventory Items

The Kennebec River has functioned as a vitally important marine highway for centuries (see Chapter 3, and Appendix F). The City of Bath exists because of this highway provided by the river. BIW, one of the state's largest private employers and the state's largest manufacturer is in Bath because of the river and other untapped economic benefits offered by the river. Downtown Bath benefits by being a destination for recreational boaters.

In 1999, the MaineDOT commissioned a study of urban waterfronts that could be support for the marine highway associated with the "Maine Strategic Passenger Transportation Plan." The study, titled "Marine Highway Waterfront Assessment" (Frederic R. Harris, Inc., 1999), reviewed three locations in Bath's downtown waterfront as sites for expanded waterfront support facilities: (1) the City Pier at Waterfront Park, (2) the Coal Pocket on the north edge of the downtown, and (3) the site often referred to as the Guilford Lot that abuts and is under the Sagadahoc Bridge. The study found that the City Pier is suitable for upgrading to service expanded ferry use, whereas the other two sites are not suitable. The City pier is, however, deteriorating and in need of being replaced.

PARKING

Where and how much parking to provide, and for whom, in a small mature city like Bath are complicated questions. Not enough parking and parking

that is not easily accessible sends shoppers to the shopping centers and malls. Too much parking takes away from the density that makes a downtown what it is and also discourages the use of public transportation. Inconveniently located long-term parking causes downtown employees to use valuable short-term spaces, moving their vehicle every 2 hours, and results in visitors who are enjoying an extended visit often getting parking tickets. Inadequate signage makes parking difficult to find. And, the enforcement of parking regulations is strict—it has to be; however, this strict enforcement sometimes upsets Bath visitors.

Parking in Bath is also complicated by the location of BIW—that is, adjacent to the downtown and to residential neighborhoods. In the past, expanding parking for BIW employees who commute to work has resulted in residential buildings being torn down and ruining neighborhoods. Not enough parking forces employees to consider residential streets and the downtown as parking options. The shortage of parking encourages more BIW employees to walk, carpool, vanpool, and take buses to work. However, to providing parking, BIW has acquired large lots on the edge of the downtown that are used solely to store vehicles for 8 or 9 hours a day—which contributes no economic benefit to the downtown.

Downtown Public Parking

Public parking lots are located on both sides of Water Street. The lot on the east side is limited to 2-hour parking and is heavily used by downtown shoppers. The lot on the west side of the street is a permit lot—that is, monthly permits are sold by the City. There is also a permit lot located on Commercial Street under the Sagadahoc Bridge on state land leased to the City of Bath. On-street, mostly 2-hour parking exists throughout the downtown. A few 4-hour parking spaces are located at the outer edges of the downtown, and parts of two streets that had been under-utilized for parking are designated for on-street permit parking.

In 1999, the City of Bath completed a parking study that found that within the downtown, parking supply was approximately in balance with parking demand. It found, however, that there were block-specific shortages of parking, primarily along Front Street.

This study and subsequent follow-up work by the City found that it was necessary to enhance parking in the downtown, identify potential locations for increasing the supply of parking, and better identify (i.e., signage) parking locations. Possible parking-expansion locations include the public parking lot next to the Bath Police Station on Water Street, and new parking along the riverfront adjacent to and under the Sagadahoc Bridge and on Commercial Street. Other recommendations included the following:

- relocation of BIW employee parking to outside of the downtown (north of Route 1) to enhance redevelopment opportunities within the downtown
- reconfiguration of on-street parking to create more parking spaces
- allowing longer-term parking on the periphery of the downtown, thus encouraging downtown employees to park in the less valuable locations and freeing up spaces in front of businesses for customers
- streetscape and other aesthetic improvements to parking lots along Water Street

Addressing downtown parking concerns is entirely a City matter. New developments in the downtown (in the C1 Zone) are not required to provide parking spaces as are developments in all other zones. When the current Land-Use Code was drafted in 2000, the City Council decided that providing parking in the downtown would be a City responsibility.

For many years, it has been suggested that a parking garage be constructed either in the downtown or at a BIW site. Two locations considered include the west side of Water Street, south of the Bath Police Station, and the BIW main parking lot on Washington Street. Studies (i.e., a 2005 study at Ohio State University and a 2002 study at the University of New Hampshire) indicated that constructing a parking garage would cost between \$15,000 and \$20,000 per space if only limited environmental and/or underground factors were associated with the construction. The studies estimated that the costs to maintain a garage were between \$250 and \$500 per space per year, depending on whether the garage was staffed.

Other Parking

Because of the proximity of BIW to the downtown, several downtown parking lots are used by BIW employees (discussed previously). Some lots are BIW-owned, others are not. In the non-BIW-owned lots, parking-lot owners rent spaces monthly to downtown employees, BIW employees, and others. Three BIW-owned lots are located at the Middle Street and Centre Street intersection, and a privately owned lot, primarily used by BIW employees, is located south of Leeman Highway between Middle and Washington Streets. Outside of the downtown, there are numerous other BIW-owned and non-BIW-owned lots, as well as a lot owned by the City. These lots are located near the south end (and South Gate) of BIW.

Other Concerns

The Land-Use Code appropriately regulates parking-lot layout, traffic circulation, vehicle and pedestrian safety, and landscaping. However, several lots that existed before these regulations were adopted are not landscaped. Some have gravel surfaces that are dusty when dry, causing sand and gravel to wash into the streets and storm drains during heavy rains and snowmelt.

BICYCLE AND PEDESTRIAN INITIATIVES

In addition to the sidewalk system discussed previously, there are a number of trails and pathways—existing, planned, and envisioned. The proposed Washington Street—Webber Avenue sidewalk from High Street to Hinckley Street can be thought of as an on-street, riverside pathway along the Kennebec River. It was described in the 2001 “Urban Design Plan.” The pedestrian path would promote walking from the South End, including Maine Maritime Museum, into the downtown. The plan also states that the City should “[n]arrow the width of Washington Street to provide a more pedestrian environment and help reduce traffic speed. Where parking is not needed, the travelway should be 24 feet wide.” Part of this South End pedestrian pathway was designed in the autumn of 2007 and planned for construction in 2009.

The Androscoggin River Bike Path is a pathway used by many walkers, runners, bike riders, and others. In 2003, Bath, Brunswick, and the MaineDOT undertook a study to determine the feasibility of extending the pathway to Bath and the Sagadahoc Bridge. The design calls for the new

pathway to parallel the north side of the southbound lane of Route 1 from the current terminus of the Androscoggin River Bike Path to the Congress Avenue interchange. The pathway would continue along Congress Avenue just beyond Chandler Drive (i.e., the Bath Shopping Center entrance) to North Street, North Street to Commercial Street, and along Commercial Street to the Sagadahoc Bridge. The concept plan for the Congress Avenue section and most of the North Street section is for a bike-pedestrian facility separated from the street. The North and Commercial Streets portion would include a bike lane and an improved sidewalk.

The Androscoggin to Kennebec Trail is a part of the East Coast Greenway, which is a national effort to establish an off-road pathway from Key West, Florida, to Calais, Maine. Until it can be constructed, an interim, on-road route has been established as follows: Androscoggin River Bike Path, Old Bath Road (in Brunswick to Bath), Old Brunswick Road, North Street, and Commercial Street to the Sagadahoc Bridge.

Also, the City of Bath began a study in 2008 to develop a concept plan for a riverfront pathway in the downtown connecting Waterfront Park at the Bath Railroad Station to the north end of the City's downtown waterfront.

There are other trail initiatives as well. In 2008, the Lower Kennebec Regional Land Trust (LKRLT), the City's Planning Department and Parks and Recreation Department, the Lower Kennebec RSU 1 and the Bath Middle School, Bath Cool Communities, The Hyde School, Healthy Maine Partnerships, Bath Area Family YMCA, interested citizens, and local businesses came together to form Bath Trails. Currently (i.e., 2008), the organization is under the auspices of the LKRLT. Although several trails, sidewalks, walkways, and other bicycle and pedestrian pathways are located in Bath that connect the South End of the City to the downtown, the highly important natural areas such as Thorne Head to the City's outdoor recreation complex and then to the YMCA, the downtown to the City's Historic District, and the neighborhoods to schools and recreation areas, they are not thought of as a connected network. The goal of Bath Trails is to connect them into an integrated system, to maintain them, to publicize them, and to get people to use them.

EVACUATION ROUTES

Depending on the type of emergency situation, the weather, and the intended destination, evacuation routes in the City of Bath include Route 1, State Road, High Street, and Old Brunswick Road.

IMPACTS OF THE TRANSPORTATION SYSTEM

BIW Commuters

The day shift at BIW starts at 7:00 a.m. and ends at 3:30 p.m. During the morning commute time, arrival times for workers are spaced out enough so there is little impact on local streets. The afternoon shift change, however, is quite different. With the entire day shift leaving at once, Washington Street, streets that connect Washington to High, and High Street are very congested for a short period. However, traffic studies for nearby development projects (e.g., the 2003 Hannaford's grocery store traffic study) do not model the BIW situation very well. Models show it as being a peak-hour phenomenon; however, the congestion—the queues on High Street at Richardson Street and at the Route 1 on-ramp—is more severe than the models indicate but for a shorter period of time.

Idling

Idling occurs in the downtown in numerous parking lots and on Front and Centre Streets, as drivers leave engines running while doing errands. It is well documented the idling a vehicle's engine negatively impacts air quality; emissions from an idling engine contain extremely high levels of carbon dioxide, carbon monoxide, nitrous oxides, and hydrocarbons. Idling also wastes fuel and money. It has been estimated that American drivers unnecessarily consume more than 2 billion gallons of fuel each year while idling. Idling in the downtown and near pedestrians and open windows is a health concern for people with asthma and other respiratory diseases and for those with heart disease.

Jake Brakes

The engine brakes that make so much noise are called Jake brakes. The system consists of a mechanism that can turn the diesel engine of a large truck into an air compressor, which then provides additional braking power. Although Jake brakes are efficient for slowing down a vehicle, they are noisy, impacting a neighborhood and resulting in complaints. Jake brakes

seem to be commonly used on High Street south of the Ledgeview Apartments and the northbound lane of the Sagadahoc Bridge.

Speeding

Speeding on High Street and Route 1 was discussed previously. Other speeding locations, according to the Bath Police Department, include Washington Street (south of Route 1 and north of Winter Street), Congress Avenue, State Road, and North Street.

Non-point Source Pollution from roadways

The Bath Public Works Department follows Best Management Practices when maintaining street, bridges, replacing culverts, and doing other maintenance and improvements projects. One of the largest sources of non-point pollution, however, is the water coming off the Route 1 viaduct. The solution to this problem will have to be a shared City-Maine DOT effort.

THE TRANSPORTATION AND LAND-USE CONNECTION

As stated at the beginning of this appendix, streets serve many (and often conflicting) functions. They carry vehicles and provide access to various land uses. There is an intricate connection between transportation and land use, which was explained in an informative briefing paper prepared for the State of Oregon's Department of Transportation and Department of Land Conservation and Development (Oregon Transportation and Growth Management Project, 2003). Parts of the paper are quoted as follows:

Transportation systems and land use patterns influence each other. Roads, transit, and other transportation elements shape land development, while the distribution and types of land uses affect travel patterns and transportation facilities. A dispersed pattern of low-density development relies almost exclusively on cars as the primary mode for transportation.

Alternatively, denser urban centers can combine different land uses in closer proximity, encouraging:

- Walking
- Biking
- Transit
- Other forms of travel

Like many planning issues, the link between land use and transportation is extremely complex. Many options have been proposed for strengthening the transportation and

land use connection. Incorporating elements of Smart Growth offer a choice of transportation options.

Conventional Development Patterns

The layout and design of land uses affect the choice of mode of travel. Often, development patterns isolate various land uses, such as residential, office, and retail land uses. Low-density commercial and residential developments have the following problems:

- Large lots and low density discourage walking and bicycling.
- Street layout funnels traffic onto major arterials, causing congestion on major streets.
- Roads are designed for mobility of cars as opposed to accessibility for all modes.
- Streets are wide with multiple lanes of traffic and often lack sidewalks.
- In commercial areas, large parking lots often separate retail businesses.
- Buildings set far apart by vast parking areas and wide access roads discourage walking between uses.
- Residential streets have gradual curves encouraging higher speeds and may end in cul-de-sacs, minimizing through-traffic.
- Community development [land use or zoning] codes usually include neighborhood street layout and design standards that only conform to the automobile.

Newer Development Patterns: Smart Growth

The design of newer development patterns displays a different street layout and land use. This alternative includes an integration of different land uses in closer proximity by promoting higher densities with a mix of land uses. The principles of this form of development include:

- The revitalization of cities and older suburbs with new growth in already developed areas.
- The protection of farms, open spaces, and sensitive environments from new development.
- The reduced cost of building and maintaining public infrastructure and services. Compact communities can be less costly to local governments, allowing communities to spend money on other services.
- Traffic-calming devices on local streets, such as traffic circles [roundabouts] or speed bumps.
- The addition of on-street parking provides a buffer between moving vehicles and pedestrians, while moderating traffic speed.
- Houses built closer to the sidewalk and street. Porches instead of garages in front facilitate interaction and are pedestrian-friendly.

This discussion highlights the relationships between transportation and land use. The “conventional development pattern” that it describes occurred in towns and cities in the United States after World War II, during the growth of the automobile era. As explained in Chapter 3, the City of Bath experienced most of its growth and development before the automobile, when people walked to work. Bath’s development pattern is not the conventional pattern mentioned in the Oregon paper—it is an old, mature development pattern, after which the “Newer Development, Smart Growth” is modeled.

Land-use regulations in the City of Bath continue to encourage this type of growth and development:

- Growth is discouraged in the rural parts of Bath.
- Infill development is promoted.
- Small lots (by Maine standards) are allowed.
- Narrow streets are allowed in new developments and narrowing of existing streets is being promoted.
- Street connectivity is encouraged.
- On-street parking in the downtown and in most residential neighborhoods is allowed.
- Access-drive management is strict.
- Houses are allowed close to the street in high- and medium-density residential neighborhoods.

PLANNING IMPLICATIONS OF THE TRANSPORTATION INVENTORY

1. Bath is a true transportation hub with Route 1, the Kennebec River, and the railroad all coming together in the downtown. This critical mass of transportation services can greatly enhance transportation access in the area as well as significantly position Bath to become more of a tourist and visitor destination. Enhancing these transportation modes and integrating them into broader community goals (e.g., neighborhood preservation and downtown revitalization) are important to the City’s economic and community-development future.

2. The Route 1 design west of High Street presents a poor image as a City gateway. It also provides poor vehicular and pedestrian connectivity between the North End and the South End in those parts of the City. The design encourages speeding, provides poor access management, and has several HCLs along or associated with it.
3. The City's participation in the MaineDOT Gateway 1 study is important for Bath as well as the rest of the Route 1 corridor.
4. The current Route 1 viaduct through the downtown has poor aesthetics and—although offering a link north and south under Route 1—creates a visual barrier and perhaps a psychological barrier between the North End and the South End of the City.
5. Although AADT counts at many locations decreased between 2002 and 2005, the MaineDOT forecasts that traffic on Route 1 in Bath, especially in the summer, will continue to increase through 2030.
6. The local committee that worked with the MaineDOT and its consultants on the conceptual design of the Route 1 viaduct replacement voted that a new, four-lane viaduct was the best alternative. Although it will be several years before the viaduct is replaced, the improvements that the study suggested for Route 1 west of High Street could be done independently of the replacement.
7. BIW commuter-traffic impacts are significantly lessened by the Sagadahoc Bridge. Any design of the viaduct replacement should ensure that maintaining free traffic flow onto the bridge is mandatory.
8. High Street, south of Route 1, serves as access to Phippsburg and Popham Beach. The traffic (and the speed of the traffic) is negatively impacting quality of life of this neighborhood.
9. Quality of life is also being impacted in neighborhoods such as the Richardson Street-Western Avenue neighborhood and the Court Street neighborhood by vehicles using local streets as cut-throughs to and from Route 1 and/or West Bath. Local streets are impacted by

BIW traffic using local streets between High and Washington Streets.

10. Although the Route 209 Bypass might solve some of these traffic problems (discussed previously), the funding of the bypass cannot be justified by the state as a Route 1 improvement.
11. HCLs help to identify trouble spots on streets and roadways. HCLs are associated with Route 1, Leeman Highway, the State Road and Congress Avenue intersection, and the Centre Street and Middle Street intersection.
12. The Rockland Branch rail line through Bath is owned by the state. In recent years, the line has had significant upgrades to rails, ties, crossings, and ballast. The line through Bath is used to move freight and for the seasonal Coastal Maine Scenic Passenger Train. The long-term plans for the line include providing tourists with multimodal, vehicle-free vacations; connecting the Rockland Branch to Amtrak; and alleviating traffic on Route 1 with a BIW commuter service.
13. Bath is served by a City-operated deviated fixed-route transit system, seasonal trolley, intercity bus, and demand-response bus service. Not all of these services connect at one location.
14. The marine highway offered by the Kennebec River has functioned as a vital economic resource for centuries and it is still a major economic resource today.
15. According to recent studies, Waterfront Park is the best location for expanded waterfront facilities to support Maine's "Strategic Passenger Transportation Plan," which envisions bringing tourists to Maine for vehicle-free vacations.
16. A 1999 study found that within the downtown, parking supply was approximately in balance with demand. It found, however, that there were block-specific shortages of parking, primarily along Front Street.

17. Several parking lots in the downtown serve BIW employees. These lots are more valuable to Bath's economy than simply storing vehicles for 8 or 9 hours each day.
18. Bath is located on the East Coast Greenway, the national non-motorized pathway from Key West, Florida, to Calais, Maine. The local long-term plan for the Greenway is to extend the Androscoggin River Bike Path from Brunswick to the Sagadahoc Bridge.
19. Sidewalks in and around the downtown need to be upgraded to meet the "walkable-city" goal described in the 1999 "Action Plan for the Bath Downtown and Waterfront." A pedestrian pathway linking various locations on lower Washington Street to the downtown, and along the river in the downtown, would provide an important connection and complement the walkable-city initiative. The various non-City and City trail and pathway initiatives could be coordinated, mapped, and publicized as a City-wide trail system. Addressing the negative impacts of the transportation system will make Bath a more pleasant and healthy community.
20. The uses of land and transportation systems have a complex connection. Being an old, mature, compact city, Bath exemplifies what is today called "Smart Growth." Bath continues to promote Smart Growth by discouraging growth in the rural parts of the City, promoting infill development, allowing small lots (by Maine standards), allowing narrow streets in new developments and the narrowing of existing streets, allowing on-street parking in the downtown and most residential neighborhoods, and permitting houses to be built close to the street in high- and medium-density residential neighborhoods.