

# ROADS

## Grade: D

### Overview

Poor pavement has increased from 2% of MaineDOT roads surveyed in 1996 to 26% in 2006. Roads rated good and fair dropped from 81% in 2005 to 73% in 2006. Due to conditions Maine motorists spend an average of \$285 per year in extra vehicle operating costs. Current funding for roads is not sufficient. The pavement preservation program for “built” roads is only funded to address half its needs.

### Introduction and Background

Maine’s highway system is the most critical transportation service for the state’s 1.3 million residents and visitors, providing access to homes, employment, shopping, agricultural land and recreation. Improved roads provide Maine’s residents with greater mobility and traffic safety, which in turn improve personal and commercial productivity and boost tourism and economic development statewide. Currently 87 percent of all Maine freight is transported via the state’s roads, and more than 95 percent of all passenger movements within Maine occur on its highway system.<sup>1</sup> Note: Bridges are covered in a separate issue brief.

Maine is a large, predominantly rural state with a current roadway system that comprises more than 22,500 miles of highway managed by several different jurisdictions – local, county, state and federal. There are over 14,000 miles of city and town roads. The state’s transportation agency, the Maine Department of Transportation (MaineDOT) is responsible for 8,547 miles, or about 38 percent of that total mileage. Table 1 compares Maine to the rest of New England in this regard.

**Table 1** New England’s Roadway Systems<sup>ii</sup>

State	Total System Mileage	State Controlled Mileage	Percent State Controlled	Apportioned Fed. Funds FY2007	Fed \$/ per Mile <sup>iii</sup>	Total State Fund. <sup>iv</sup>
Connecticut	21,248	3,716	17	\$463,276,000	\$124,670	1.2 B
<b>Maine</b>	<b>22,783</b>	<b>8,547</b>	<b>38</b>	<b>\$155,135,000</b>	<b>\$18,150</b>	<b>0.6 B</b>
Massachusetts	35,936	2,830	8	\$570,957,000	\$201,751	2.7 B
New Hampshire	15,646	3,981	25	\$157,763,000	\$39,628	0.5 B
Rhode Island	6,528	1,104	17	\$175,036,000	\$158,547	0.5 B
Vermont	14,406	2,633	18	\$147,121,000	\$55,875	0.3 B

It is evident from Table 1 that the size of Maine’s roadway system is only surpassed in New England by Massachusetts. Furthermore MaineDOT is responsible for a greater percentage of this total than any other state DOT in the northeast. In fact, MaineDOT controls more than twice the mileage of any other New England DOT.

For purposes of this report card, Maine ASCE has chosen to focus its attention on the 6,272 miles of MaineDOT-controlled roads that are analyzed by federal functional<sup>1</sup> class, as well as the separately controlled 110-mile Maine Turnpike from Kittery to Augusta. These particular roads provide the state with its primary interstate

<sup>1</sup> Federal functional classes include interstate, freeway/expressway, other principal arterials, minor arterials and major urban collectors and are broken out in Table 2 on page 2.

and intrastate mobility, and in fact carry most of the daily vehicle miles traveled within Maine. All of MaineDOT-controlled roads carry 78%<sup>v</sup> of vehicle miles travelled in Maine and, with just 110 miles of highway, the Maine Turnpike carries approximately 9%.

**Table 2** The MaineDOT roadway network is broken up into Federal Functional Classes<sup>vi</sup>:

<b>Federal Functional Class</b>	<b>Urban Miles</b>	<b>Rural Miles</b>	<b>Total Miles</b>	<b>Approx. VMT % of total<sup>vii</sup></b>
Interstate (not MTA)	44	322	366	13%
Freeway/Expressway	14	5	19	1%
Other principal Arterials	150	808	958	19%
Minor arterials	241	1051	1292	20%
Major/urban Collectors	451	3286	3737	22%
<b>Totals:</b>	<b>900</b>	<b>5472</b>	<b>6272</b>	<b>75%</b>

Note: Maine Turnpike, MaineDOT state-aid, and Local roads make up the remaining VMT.

**Daily Vehicle Miles of Travel (VMT)** on Maine's highways increased 9.3% between 2000 and 2006, rising from just under 33 million to 36 million,<sup>viii</sup> for an average rate of 1.45% compounded annually. Of that increase, the majority was on the urban system, which grew 27%, while travel on the rural system during those six years only grew 3%.

### Condition and Adequacy

According to The Road Information Program (TRIP), a non-profit transportation research organization, a desirable goal for organizations that are responsible for road maintenance is to have 75% of their major roads in good condition. Maine currently does not meet this standard except on the interstate.<sup>ix</sup> In fact, TRIP estimates that *Maine's road conditions are currently costing each Maine motorist an average of \$285 per year in extra vehicle operating costs (accelerated depreciation, additional repair costs, increased fuel consumption, and increased tire wear), which amounts to over \$286,000,000 statewide costs annually.*

To determine the condition of Maine roadways, three existing composite indices are used.

- **The Maine Economic Growth Council's composite "Roadway Deficiency Index"**<sup>x</sup> This index evaluates three criteria: narrow lanes, deficient bridges and poor pavement. The greater the value, the greater the problem. Based on 2006 data, Maine's transportation infrastructure scored 86, up from 85 in 2005 and 65 in 2002. The report gave this indicator a "red flag," indicating that state highways "need attention, with a trend toward dramatic decline." The primary reason for the rating increase is the amount of poor pavement, which has increased from 2% in 1996 to 26% in 2006.
- **MaineDOT's composite Highway Adequacy Index (HAI).**<sup>xi</sup> The HAI is an empirical evaluation of the health of a particular highway segment, that takes into consideration pavement condition (50%), safety (25%) and service (25%). For 2006, 6,238 miles were reviewed and rated. The 2006 HAI is: good 50%; fair 23%; **poor 15%; and critical 10%** (2% is missing). By contrast, the HAI in 2005 was 81% good and fair in comparison with only 7% at critical stage.<sup>xvi</sup> Urban Roads only had 14% of their system rated as good. This is concerning as this is where the majority of growth in the system is occurring. When broken down by federal functional class:
  1. Interstate HAI 99% Good
  2. Arterials HAI 60% Good
  3. Collectors <40% Good
- **Hartgen Report.**<sup>2</sup> MaineDOT has dropped in its national ranking of cost effectiveness, as measured by the Reason Foundation, from 12<sup>th</sup> in 2001 to 22<sup>nd</sup> in 2006.<sup>xii</sup>

<sup>2</sup> The Reason Foundation study measures the performance of state-owned roads and highways from 1984 to 2005 in 12 different categories, including traffic fatalities, congestion, pavement condition, bridge condition, highway maintenance and administrative costs, to determine each state's ranking and cost-effectiveness. David T. Hartgen, Ph.D. is the study's lead author.

In addition, statewide highway safety, mobility data, local roads and Maine Turnpike pavement condition data are also considered.

**Highway Safety**<sup>xiii</sup>: Maine currently averages 188 fatalities on its highways annually (for all Maine roads), or a fatality rate of 1.132 deaths per 100 million miles travelled. The national average is 1.453. Among the New England states, Maine has had the highest fatality rate four of the past five years, though the five New England states typically have been some of the lowest in nation. In 2005, Maine published its Strategic Highway Safety Plan "One is Too Many."<sup>xiv</sup> The plan outlined action items that would help in addressing fatalities on Maine's roads.

**System Mobility**: In 2004, less than 10% of Maine's arterials experienced moderately high or worse congestion. Most of that delay was seasonal and only during peak hours such as the 5 pm commute hour. The majority of current and future delays will occur on the state's urban arterials, where capacity is limited, volumes are high and land use access is generally uncontrolled. Growth in development along these corridors has resulted in more driveway entrances and left-turn turning movements adding to the congestion. In addition to traffic issues causing mobility concerns, condition of the roadway also provides inefficiencies each Spring, when approximately **25 percent** of state highways are posted (restricted for loads over 23,000 pounds).<sup>xv</sup>

Current congestion mitigation activities and projects:

- Currently, some use of Intelligent Transportation Systems (ITS) has been implemented as part of a statewide ITS strategic plan to increase highway safety and efficiency (variable message signs, roadway weather stations and traffic information systems).
- Recent projects like the Gray bypass and the Gorham bypass, both of which take traffic out of congested downtowns, will also enhance system mobility.
- In addition, over \$6 million in Congestion Mitigation and Air Quality (CMAQ) funds will again be available for intersection and mobility projects beginning October 1, 2009 due to a federal requirement that these funds no longer be used for passenger rail.
- Over 50 intersections have been identified for improvements in 2008-2009 biennial budget.

**Local Roads**: The Portland Area Comprehensive Transportation System (PACTS) recently reviewed 200 miles of collector roads within their system and only 12% of these roadways meet current design standards, 30% need minor upgrades to bring them up to standards and the remaining 58% of the roadways would require roadway widening or full reconstruction to meet the current design standards.<sup>xvi</sup>

**Maine Turnpike**: The average segment of pavement of the 110 mile Maine Turnpike rates a 7.8 out of a possible 10.0.

## Investment Needs

Maine is among more than forty states with a dedicated fund to finance construction and maintenance of major roads and bridges. About two-thirds of the state's Highway Fund revenues come from the fuel tax. The other third comes from vehicle registrations, titles, driver's licenses, and fines and penalties. About 80% of Maine's Highway Fund revenues are used to plan, design, construct, and maintain highways and bridges. The remaining 20% goes to financing a portion of the State Police and a majority of the Secretary of State's Motor Vehicle Division.<sup>xvii</sup>

Over the past twenty years, MaineDOT has seen its buying power from its revenue stream steadily decline. This can be attributed to inflation, an extraordinary rise in fuel and material prices, and increased vehicle fuel efficiency. As revenues declined over this period so too did transportation system spending as a state priority. In 1976, state investments in highway transportation represented 26% of all state spending. Today that figure is only 11%.<sup>xviii</sup> When resources are limited, maintenance is often deferred, thus costing the agency more in the long-run.

Unfortunately, deferred maintenance has negative ramifications in future years. Maine is in the middle of this situation today. The Hartgen Report indicates that Maine spends \$29,542 which is less than 20% of the New England average (\$151,000) on a per-mile basis on its capital program for roads and bridges. Maine spends less than any other New England state on a per mile basis (\$18,831) on its maintenance program (average of the other four

New England states is \$54,500 per mile). Under-investing in our road system for a number of years has created a growing backlog of unmet needs that is severely burdening our state today.

According to MaineDOT,<sup>xix</sup> 535 miles of arterials and 2,135 miles of collector roads need to be reconstructed to modern standards (“unbuilt” were created before 1950s or have reached HAI ratings of critical or poor). This effort over the next 20 years would cost over \$432 million per biennium to complete and fulfill the requirements of 2008 legislation. Current biennial budgets, though, only fund a small fraction of that amount. To preserve the current “built” system of arterials, including the interstate, with the Pavement Preservation Program (PPP), an investment of \$181 million per biennium would be required. As seen by the **Pavement Life Cycle** chart<sup>xx</sup>, preserving the investment of a “built” road needs to occur when the pavement condition rating reaches “fair.” Current MaineDOT paving budgets, though, will only fund half of the needed PPP.<sup>xxi</sup>



The Maine Turnpike collects 100% of its revenues from toll and concessions and does not receive any state or federal funds. In 2008, revenues are on the decline, with recent projections for 2008 of negative growth over 2007 (planned growth had been 2.5% per year)<sup>xxii</sup>. Over the past five years, the MTA has seen capital project costs for road and bridge projects increase an average of 11% per year.<sup>xxiii</sup> While MTA operating budgets have been cut, and can be further managed, capital cost projections for the next five-year period, especially bridges and paving, will far exceed current revenue forecasts. The Maine Turnpike has a \$559 million capital program planned for the next 10 years. The MTA announced in October 2008 that a toll increase in 2009 is likely in order to accommodate this need.

The preliminary estimate to bring the Portland area (PACTS) collector system up to standard would be approximately \$189 million with an additional \$40 million required to maintain those roadways that either meet or could meet the design standards with either a design exception or minor improvements. This far exceeds the \$5.6 million PACTS can appropriate towards their collector road improvements each biennium.<sup>xxiv</sup>

In 2007, the Maine Better Transportation Association in conjunction with key members of the Legislature’s Transportation Committee put forward LD 1790, an Act to Secure Maine’s Transportation Future before in the 123<sup>rd</sup> Maine State Legislature. This bill set forth a comprehensive transportation capital improvement program based on measurable goals. This legislation eventually passed, but with no funding attached. Later in 2007, MaineDOT released its Statewide Long-Range Transportation Plan, *Connecting Maine*, for which recent updates document a total transportation system need of \$6.5 billion over the next 10 years,<sup>xxv</sup> with funding only projected at \$3.2 billion. MaineDOT highway needs represent \$3.99 billion of the total need (excluding bridges).

In 2008, the Legislature and the Governor enacted several new and critical infrastructure initiatives that included new money for bridges and other transportation needs. MaineDOT will receive an additional \$58 million of new funding over five years for roadways from revenue bonds that are supported by new fees. While a step in the right direction, this additional revenue falls significantly short of the projected gap. Recent cuts to the existing MaineDOT biennial budget and further paving project deferrals and cancellations in August 2008 do not bode well for the future condition of Maine’s highways.<sup>xxvi</sup> Bridge funding issues are covered in the bridge issue brief.

**Conclusions and Recommendations**

In 2008 it is apparent that the condition of Maine’s roadway system is on the decline. Current investment levels by the state are not sufficient to address the growing needs of the system. Maine must restore investment in its highway infrastructure as a funding priority for the safety and economic well being of the state’s residents and businesses. Maine ASCE gives Maine roads a grade of **D**.

Maine ASCE makes the following recommendations:

- Maximize existing resources of funding, such as state's general fund, bonds, impact fees, tolls and car registration fees, as continued reliance on gas tax for majority of MaineDOT funding will not suffice;
- Identify new funding sources;
- Maintain the existing roadway network in safest and most cost effective way;
- Fully fund the Pavement Preservation Program at \$181 million per biennium;
- Provide additional funding to improve "unbuilt" segments of roads to modern standards;
- Implement the strategies to address the four focus areas as outlined in the Maine Highway Safety Strategic Plan (June 2007),<sup>xxvii</sup>
- MaineDOT and its partners need to continue simple operational techniques for congestion mitigation, such as intersection improvements, as well as continue to study the need for bypasses and capacity enhancements where required; and
- In densely populated areas, develop more efficient land use policies to assist in mitigating growth in congestion.

**Sources:**

- <sup>i</sup> Losing Ground, A Report on the State of Maine's Highway Fund, July 2005, Maine Better Transportation Association
- <sup>ii</sup> FHWA website "Highway Statistics 2006", Section V Roadway Extent, Characteristics, and Performance, HM-10.
- <sup>iii</sup> FHWA website "Highway Statistics 2006", Section IV Finances, FA-4
- <sup>iv</sup> FHWA website "Highway Statistics 2006", Section IV Finances, SF-21
- <sup>v</sup> MaineDOT State of System report, 2006, from MaineDOT website & email Todd Pendleton, HNTB, Traffic Engineer dated 8/28/08
- <sup>vi</sup> Maine Highway Adequacy report by Maine DOT August 2006
- <sup>vii</sup> MaineDOT State of System Report (on web site 4/1/2008)
- <sup>viii</sup> FHWA website "Highway Statistics 2006", Section V Roadway Extent, Characteristics, and Performance, Table HM-81
- <sup>ix</sup> Future Mobility in Maine: Meeting the State's Need for Safe and Efficient Mobility, April 2007, by TRIP, Washington, DC at <http://www.tripnet.org/MaineReportJune2007.pdf>
- <sup>x</sup> Maine Economic Growth Council and Maine Development Foundation, Measures of Growth in Focus 2008.
- <sup>xi</sup> Maine Department of Transportation Highway Adequacy 2006 Interim Report.
- <sup>xvi</sup> MaineDOT State of System Report (on web site 4/1/2008)
- <sup>xii</sup> <http://www.reason.org/ps360/>
- <sup>xiii</sup> MaineDOT Office of Safety
- <sup>xiv</sup> <http://www.maine.gov/mdot-stage/safetyoffice/pdf/strategic%20plan%20rev%206.1june2007a.pdf>
- <sup>xv</sup> Email from Robert Skehan, Maine DOT September 24, 2008
- <sup>xvi</sup> Excerpt from a preliminary report on PACTS collector road program, email from Gorrill-Palmer, Oct. 8, 2008
- <sup>xvii</sup> Losing Ground, A Report on the State of Maine's Highway Fund, July 2005, Maine Better Transportation Association
- <sup>xviii</sup> Losing Ground, A Report on the State of Maine's Highway Fund, July 2005, Maine Better Transportation Association
- <sup>xix</sup> Email from Robert Skehan, Maine DOT September 19, 2008
- <sup>xx</sup> Chart provided by Roland Lavallee, HNTB Corp. Originally from Army Corp of Engineers.
- <sup>xxi</sup> Email and Phone conversation with Robert Skehan, MaineDOT September 22, 2008
- <sup>xxii</sup> Interviews with MTA personnel August 2008, and Board meeting minutes and updated 10 yr plan from same time period
- <sup>xxiii</sup> AGC inflation chart from website at [www.agc.org](http://www.agc.org)
- <sup>xxiv</sup> Excerpt from a preliminary report on PACTS collector road program, email from Gorrill-Palmer, Oct. 8, 2008
- <sup>xxv</sup> Email from Gerry Audibert, MaineDOT, dated August 5, 2008 regarding 'Connecting Maine' updated information
- <sup>xxvi</sup> Announcement by MaineDOT August 2008 to cancel remaining paving projects for 2008 due to high cost of asphalt and lack of funding
- <sup>xxvii</sup> <http://www.maine.gov/mdot-stage/safetyoffice/pdf/strategic%20plan%20rev%206.1june2007a.pdf>