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AMERICAN SOCIETY OF CIVIL ENGINEERS

Report Card for Maine's Infrastructure

December 6, 2012

Maine Section
American Society of Civil Engineers

Infrastructure Area		2008	Trend*	2012	2012 Report Card on Maine
Contaminated Site Remediation		D+	⇧	**C-**	Petroleum spills still threaten drinking water s (primary funding source for remediation in Ma remediate, and redevelop sites where contami goes into effect in 2013.
Dams		D+	⇔	**D+**	Maine has over 1,000 registered dams of whic Maine's dams are low-hazard potential, do not Dam Safety Program, spends much less than t
Energy		C+	⇧	**C+**	The overall health of Maine's electricity infrastr electricity and renewable energy credits to the $1.4 billion Maine Power Reliability Program, system's age.
Municipal Drinking Water		C	⇧	**C+**	An estimated two-thirds of Maine residents are ed over the next 20 years. Federal and state fu has been improved funding for treatment, stora
Municipal Wastewater		D+	⇔	**D+**	Maine's 2008 Clean Watersheds Needs Surve Revolving Loan Fund (CWSRF). CWSRF fund ing capital projects is not sustainable. The lac health.
Schools (PreK-12)		C-	⇔	**C-**	Maine schools face a $1.7 billion capital fundin funded over the past 12 years; some projects h
Solid Waste		C	⇩	**C-**	Maine's solid waste disposal rate has declined mains below state-established goals. Despite r al needs; however, changes in policies and lon
State Parks		B-	⇩	**C+**	State parks are a key component of tourism- M there has been little capital investment made focus of limited funds available is primarily on h
Transportation	**Airports**	B-	⇧	**B**	Over the past four years, Maine's airport syste terminal construction/expansion projects and n of the New England states in terms of federal g
	Bridges	D+	⇧	**C-**	28% of Maine's bridges are deficient which is s of deficient Maine bridges since 2008. Howeve the condition of Maine bridges to meet recently
	Passenger Transportation	C-	⇩	**C-**	Maine's transit ridership grew 22% from 2006 sustainable funding remains unidentified. Ferr vessels, but the state needs to identify viable fu
	Ports & Waterways	C-	⇧	**C+**	Maine's seaports are in good condition, and n remain competitive, safe, and secure, especial required to facilitate projected surges in contai cial fishing, and recreation industries.
	Railroads	C	⇧	**C**	Maine has 1,154 miles of active railroad and s customer rail sidings and interchange improve 6% to 30% since 2008.
	Roads	D	⇧	**D**	Thirty-eight percent of Maine's major roads ha extra vehicle operating costs. Maine is the high will not meet legislative goals for roads and bri
Overall Grade		C-	⇧	**C-**	Maine's economy is built on its infrastruc Current and forecasted funding is inadeq needs to be a higher priority. While marg was due to additional federal funds or sta

A is exceptional where all aspects of the area are in great shape.

B is good where condition is safe and reliable; there are minimal capacity issues and minimal risks.

C is mediocre; condition and capacity are adequate in general, though some risks and consequences of failure which need to be weighed when prioritizing funding. Maintenance is likely being deferred due to inadequate funding.

D is poor; increased will likely h

e's Infrastructure Overview:

supplies throughout Maine, as do some landfills. MaineDEP has made adjustments to stabilize the Groundwater Fund aine) and to control the location of above-ground storage tanks. Policies have been established in Maine to investigate, nation poses a risk to the environment and human health. A new state funding source for landfill remediation and closure

n 153 are classified as high- or significant-hazard-potential. 131 federally regulated dams are in good repair. A majority of generate revenues and are more than 50 years old. Half of Maine dams are the responsibility of private owners. Maine's the other Northern New England states, and is understaffed and has no enforcement division.

ructure has improved slightly since 2008. Maine's extensive and diverse generation mix allows Maine to be a provider of e region. Most weak transmission links and interface limitations identified in 2007 are currently being addressed by the which will be complete in early 2015. Additional maintenance and capital investments are still needed to address the

served by 151 public community drinking water systems. Approximately $1 billion in water infrastructure projects is need- unding for the last 10 years was approximately $22 million leaving a potential shortfall of over $500 million. While there age, filtration and security issues, the funding gap is significant, specifically in regard to aging distribution systems.

y listed an estimated wastewater infrastructure need of $1 billion. The primary source of funding is the Clean Water State ding is stressed and projected to decrease in coming years. As a whole, the wastewater industry business model of fund- ck of funding for infrastructure investment and proper maintenance adversely affects Maine's ability to protect the public

g gap based on current state funding programs. Less than half of priority health and safety project requests have been have had repeated requests. School consolidation has resulted in closure of some deficient schools.

since 2008; however, per-capita waste generation remains higher than the national rate. Recycling is stagnant and re- o new landfill capacity and closures of a commercial landfill and an incinerator, capacity exists to meet short term dispos- g term planning and investment are necessary to ensure that new disposal capacity is developed in a timely manner.

Maine's number one industry. The condition of the infrastructure of Maine's 48 state park facilities is adequate. However, since 2008 to help reduce maintenance backlogs, enhance the level of service and gain greater economic impact. The health and safety improvements and there continues to be over $30 million in needed improvement projects.

m has experienced a number of high profile improvements including twelve runway rehabilitation projects, two major umerous taxiway/apron rehabilitations, obstruction removal and other safety enhancements. Although Maine ranks last grant expenditures per airport, the state's airport infrastructure is in good condition and has improved modestly.

slightly worse than the national average of 24%. Recent bridge funding initiatives facilitated a 6% reduction in the number er, the expiration of those initiatives coupled with reduced funding threatens to erode this progress. Continuing to improve y adopted performance goals will require increasing MaineDOT bridge funding to $106 million annually.

to 2010. However, only 46% of transit vehicles are in good condition. Passenger rail continues to expand, yet long-term y services provide primary transportation to island communities and have seen marked improvements with facilities and unding for vessel replacements to maintain service levels.

more than $30 million has been invested in capital improvements since 2008. Continued investments are still needed to lly in areas of dredging and maintaining unhindered access to Searsport and Portland Harbor. Long-term investments are nnerized traffic. Maine should continue to promote enhancements to ports and harbors serving its viable cruise, commer-

several intermodal facilities, primarily serving the pulp and paper industry. Recent capital projects included track repairs, ments. Rail infrastructure in Maine has improved slightly and MaineDOT's ownership of active railroad in Maine rose from

ave only fair to unacceptable conditions. Due to poor conditions, Maine motorists spend an average of $299 per year in hest of all New England states in miles of highway under state jurisdiction and the lowest for funding per mile. MaineDOT dges unless a $150 million per year gap in funding is resolved.

ture. The health, safety and welfare of our citizens are directly tied to the quality of our infrastructure. uate to meet current and future needs. If Maine is to grow economically, investment into infrastructure inal improvements over all were made in Maine from 2008 to 2012, a significant portion of that increase ate bonding. Obtaining the necessary additional funding is not likely and action is needed.

condition and capacity are concerning with risk of failure high, condition and/or capacity have a negative impact on economic activity.

***Trend:** The trend arrow signifies movement in a positive, neutral or negative direction. In some cases, there was improvement but not enough to change the grade.

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2012 Report Card FOR MAINE'S Infrastructure

The maintenance and improvement of Maine's infrastructure is vital to our economy, health, safety, security and to the environment. The Maine Section of the American Society of Civil Engineers (Maine Section ASCE) represents over 750 civil engineering professionals who live and work in the State of Maine. As a public service to the residents of Maine, a team of engineers and industry experts volunteered hundreds of hours in both 2008 and 2012 to review public records and provide an overview of infrastructure in Maine. The 19 lead authors in 2012 have a combined 460 years of experience. The first report was published in December 2008. This 2012 report card provides an update in order to determine progress or decline in each infrastructure area since 2008.

The Maine Section ASCE analyzed the following fundamental components of each infrastructure area:

- Existing conditions,
- Capacity,
- Operations & maintenance or deferred maintenance,
- Public safety & security,
- Risk and consequences of failure, and
- Current and projected levels of funding.

As with the national report cards produced by ASCE, the purpose of this state report card is to raise public awareness of the importance of a modern and well-maintained infrastructure.

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For full report card briefs go to **www.maineasce.org**

Maine Section
American Society of Civil Engineers

CONTAMINATED SITE REMEDIATION

Grade: C-

Overview

Petroleum spills still threaten drinking water supplies throughout Maine, as do some landfills. MaineDEP has made adjustments to stabilize the Groundwater Fund (primary funding source for remediation in Maine) and to control the location of above-ground storage tanks. Policies have been established in Maine to investigate, remediate, and redevelop sites where contamination poses a risk to the environment and human health. A new state funding source for landfill remediation and closure goes into effect in 2013.

Background

Collectively, the U.S. Environmental Protection Agency (EPA) and Maine Department of Environmental Protection (DEP) administer six programs that oversee contaminated site investigation, remediation, and redevelopment:

- EPA's Superfund Program;
- DEP's Uncontrolled Sites Program;
- DEP's Petroleum Clean Up Program;
- DEP's Voluntary Response Action Program (VRAP);
- EPA's and DEP's Brownfields Programs; and
- DEP's Landfill Closure Program

Condition and Adequacy

EPA's Superfund: The federal Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) was enacted in 1980 to respond to the improper disposal of hazardous substances that occurred prior to the regulation of waste disposal, and it allows EPA to clean up sites and compel potentially responsible parties to perform cleanups or reimburse the government for EPA-led cleanups. It is commonly called the "Superfund" program because of the large trust fund established by the law to pay for the cleanup activities. The law was enacted in the wake of the discovery of toxic waste dumps such as Love Canal and Times Beach in the 1970s. As part of the program, the "dirtiest discovered" sites are placed on the EPA's National Priority List (NPL) after initial investigation indicates that federal involvement is warranted. As of October 2012, 15 of the nation's 1,730 NPL sites are located in Maine.

Of the 15 NPL sites in Maine, one site (Leeds Metal) was recently listed and clean-up activities have not yet commenced; two sites are currently being actively remediated; investigation and remedial work at ten sites is deemed complete, with only continued monitoring; and two sites have been removed from the NPL. The latest addition to Maine's NPL sites was Leeds Metal located in Leeds that was added to the NPL on September 18, 2012. Since 2008, remedial construction has commenced at Callahan Mine and Leeds Metal has been listed. The Superfund law also requires the federal government to identify and address environmental problems from past activities at current and former military installations, even when the environmental issue is not eligible for the NPL. Three military installations - the former Brunswick Naval Air Station, the former Loring Air Force Base, and the Portsmouth Naval Shipyard - are included in the 15 Maine sites on the NPL.

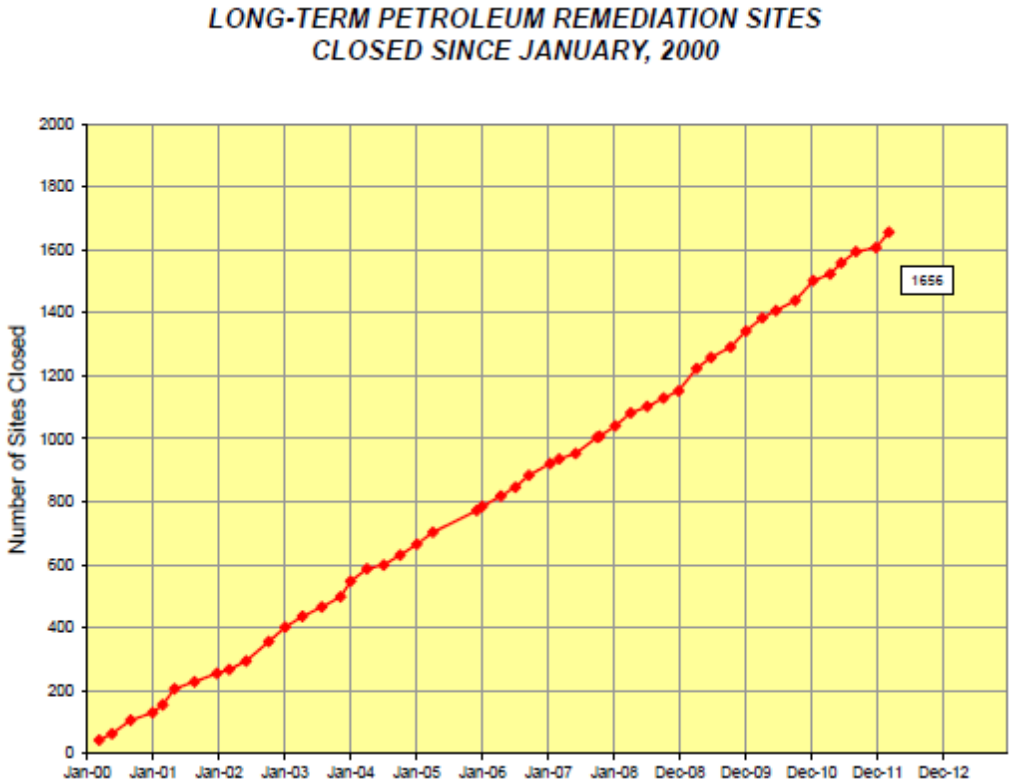
The Superfund cleanup process is complex, with several distinct steps from discovery to cleanup to post-remedial-construction monitoring before removal from the NPL. The Superfund law and subsequent amendments established an $8.5 billion national trust fund for investigation and cleanup of NPL sites.

DEP's Uncontrolled Sites Program: Maine's Uncontrolled Hazardous Substance Sites Program (Uncontrolled Sites Program) was created in 1983 and is Maine's equivalent of the federal Superfund program. The program was

created in response to threats or potential threats to human health and the environment posed by abandoned hazardous waste sites not eligible for NPL status. This Program's founding legislation authorizes DEP to issue orders to potentially responsible parties requiring them to conduct DEP-approved cleanup actions. If there are no viable potentially responsible parties, the legislation authorizes DEP to undertake necessary remedial actions.

State-led remediation is funded through bonds. According to DEP's website, more than $20 million has been spent to date on state-led site remediation bringing 279 sites to closure. In the last Report Card in 2008, the state had remediated 203 sites. In 2008, DEP listed 230 uncontrolled sites as requiring further action. As of August 8, 2012, 198 uncontrolled sites requiring further action were on DEP's list.

DEP's Petroleum Clean-Up Program: Maine's reliance on oil is estimated to include more than 300 million gallons of home heating oil each year[1]. DEP estimates more than 90,000 gallons of petroleum products, mainly kerosene and heating oil, are spilled in Maine each year. Investigation and remediation of petroleum contamination is managed by DEP's Petroleum Clean-Up Program that was established in 1991. As of August 2012, approximately 500 active sites were listed on DEP's Petroleum Priorities List, which includes only those petroleum-contaminated sites referred to DEP's Technical Services for long-term remediation and does not include: (1) the thousands of spills that DEP's Response Services manage on a daily basis each year; and (2) the sites DEP has successfully remediated (i.e., 1,656 since 2000 as per DEP graph below).



According to the DEP, one of the largest challenges is how to reduce the number of new discharges of oil and their severity. Because the rules for underground oil storage have become more restrictive since the 1990s, the majority of oil storage and, therefore, spills now occur above ground as opposed to underground. However, these surficial spills still pose an imminent threat to, or have resulted in, contamination of private and public drinking water supplies and surface water. Therefore, more restrictive rules for siting aboveground oil storage facilities were enacted in 2010 with the intent of limiting contamination of groundwater.

[1] Supporting documentation for LD 553 – An Act to Reduce Maine's Dependence on Oil (2009)

Remediation of groundwater impacted by petroleum is funded by the Ground Water Oil Clean-up Fund (Groundwater Fund). The fund's income is derived from fees on importation of oil to Maine, registration fees from oil storage facilities, fines, and reimbursements (e.g., from potentially responsible parties). In 2008, the Groundwater Fund risked insolvency as a result of an unusually large number of grossly contaminated sites undergoing remediation. Several adjustments to the general administration of the Groundwater Fund were made from 2009-2010 and codified in 2011, resulting in net fund availability at the end of FY 2011of $4.6 million.

Voluntary Response Action Program (VRAP) and Brownfields Program: An unintended consequence of the Superfund law is that properties with an industrial past are assumed to have insurmountable environmental liability. By definition, brownfield sites are property, whose expansion, redevelopment, or reuse is impeded because of contamination, real or perceived. DEP cites the following benefits of brownfields redevelopment: the protection of public health and the environment through the cleanup of commercial and industrial properties; slowing urban sprawl by encouraging reuse of properties; the use of existing infrastructure; the increased tax revenues and creation of jobs; and the revitalization of declining commercial and industrial communities.

In 1993, Maine legislation established the Voluntary Response Action Program (VRAP) that allows and encourages applicants to voluntarily investigate and remediate properties to the DEP's standards in exchange for protections from DEP enforcement actions, including the uncontrolled and petroleum priority sites discussed above. Most brownfield sites enter VRAP. Remediation of brownfield sites conducted with oversight of the VRAP process is privately funded, but can result in the release of environmental liability (to the extent allowed by the VRAP law). Because the VRAP incentive has been so successful in Maine (i.e., lenders for brownfield development often require VRAP approval as a condition of financing), VRAP applicants often discover site-specific eligibility for partial reimbursement through the Groundwater Fund due to contamination from an oil storage location. In 2010, DEP estimated that VRAP reimbursements increase the demand on the Groundwater Fund by about $3 million each year.

While remediation under the VRAP process is primarily privately funded, the EPA provides some funding for brownfield redevelopment through two competitive grant programs, primarily to benefit municipalities' focused economic development. Both programs require DEP involvement through the VRAP process and pose additional requirements (e.g., assessment of redevelopment potential, etc.) and/or limitations (e.g., grant budget of $50,000 or less, achieve clean-up standards before development begins, etc.). According to EPA's website, DEP has received and administered $10.3 million in EPA grants to date, which range from site assessments to active remediation. As of August 8, 2012, 87 brownfield grant sites and an additional 607 VRAP sites have been returned to productive use in Maine since the inception of the programs, which is a significant increase from 2008 (i.e., 35 brownfield grant sites and 427 VRAP sites). DEP list of active sites (as of August 8, 2012) included 174 brownfield grant sites and an additional 130 VRAP sites (as compared to 78 brownfield and 120 VRAP sites, respectively in 2008).

Landfill Closure Program: In 1987, Maine enacted legislation that established a remediation and closure cost sharing program for municipal landfills. Between 1989 and 2000, the DEP's Closure and Remediation Program provided $79 million to municipalities to assist with the closure of 397 unlined municipal landfills. As of January 2012, the program had also provided over $2.5 million in matching funds for remediation activities (i.e. addressing groundwater and landfill gas concerns) that persisted at certain landfills after the landfills had been closed to the standards of the day.

Since the program was established by the legislature in 1987, there have been numerous statutory changes made, with the most recent change occurring in 2011. The 2011 modification extended the DEP cost sharing for landfill closure-related costs until 2015. The goal is to continue to assist with remedial or corrective actions at landfills that contaminate, or threaten to contaminate, groundwater by funding 75% of related costs that were incurred between 1994 and 2015. The DEP obligation for landfill closure-related activities through 2015 is estimated to be between $1.1 and $5.2 million. Many of the remaining "closures" are facilities where corrective action attempts have been unsuccessful. In addition, the DEP's remediation obligations are estimated to be $3.5 million.

Previous funds were provided by a mix of voter-approved bonds (latest 2008) and general fund appropriations (latest 1999). In 2012, with the passing of L.D. 1278, An Act to Stabilize Solid Waste Management Funding, a new fee was imposed on construction and demolition debris and residue from the processing of demolition debris. Starting January 1, 2013, a $1 per ton fee will be leveed on construction and demolition debris, increasing to $2 per ton in

2014. This law identifies that this fee "may be expended only for the state cost share to municipalities under the closure and remediation cost-sharing program for solid waste landfills." The law also includes language allowing for an exception to paying the fee for facilities less than 6 acres in size. An evaluation of the revenue that is brought in after the initial implementation of this fee will identify whether additional funding sources are necessary.

Conclusions and Recommendations

Established policies and programs at the federal and state levels provide guidelines and partial funding to investigate, remediate, and redevelop contaminated sites once they are discovered. In general these policies and programs are adequate, but are not enough to cover the cost of clean-up. DEP's VRAP incentives have been successful in revitalizing many communities throughout Maine. However, an unintended consequence of this success may have contributed partially to the insolvency of the Groundwater Fund in 2008. DEP, along with the Fund Insurance Review Board, made significant adjustments to the administration of the Fund and associated policies and programs to reduce the demand on the Fund, including:

- Establishing more restrictive siting requirements for Above Ground Storage Tanks (Chapter 691 enacted in 2010);
- Closer technical oversight, which includes peer review, prioritization and a revision of health-based risk standards; and
- Additional spill prevention and control measures (i.e., statute prohibiting oil discharge; certification for tank operators, installers, inspectors; etc.).

Drinking water supplies have been and continue to be contaminated and require remediation, mainly funded through the Groundwater Fund. Limited funds are available for brownfield redevelopment and are currently limited to grants from EPA (i.e., $50,000 or less per site with significant grant application obligations). Landfill closure costs, which are estimated to total $1.1 million to $5.2 million, are currently unfunded; however, a means has been established to fund some of these costs in the future. Maine ASCE gives contaminated site remediation a grade of C-.

Maine ASCE makes the following recommendations:

- Continue to provide additional funding in the form of bonds and increased revenues for the "groundwater fund" to ensure the multi-million dollar backlog of remediation projects are brought to successful closure;
- Continue to evaluate and revise regulations to achieve a balance of protection and workability with the intent of reducing the need for these funds in the future;
- Determine the best use of available funds. This determination must be made by risk-based prioritization of identified sites in and across the multiple programs and through accountability;
- Shift focus from reactive to proactive, such as enforcing the preventative aspects of existing regulations; and
- Continue to leverage EPA cost sharing opportunities for remediating sites in Maine.

Sources:

- "Municipal Landfill Closure & Remediation Program History and Future Program Requirements for Protecting our Investment in Maine's Future," prepared by DEP – BRWM Landfill Closure and Remediation Program, dated January 23, 2012;
- L.D. 1278 "An Act to Stabilize Solid Waste Management Funding," enacted March 20, 2012.
- "Annual Report of the Fund Insurance Review Board Submitted to the Joint Standing Committee on Environment and Natural Resources," prepared by DEP, dated February 15, 2012;
- "How To Cure Maine's Addiction to Heating Oil," prepared by Bill Strauss, PhD of FutureMetrics, dated January 2011;
- "2006 Statistical Report Division of Response Services, Spill Report Case Load," prepared by DEP – BRWM, dated June 2010;
- United States Environmental Protection Agency (http://www.epa.gov/superfund/) last accessed in October 2012;
- Bureau of Remediation and Waste Management, Maine DEP (http://www.maine.gov/dep/spills/uncontrolledsites/) accessed in August 2012; and
- Maine DEP Bureau of Remediation and Waste Management, Division of Technical Services on August 14, 2012.

DAMS

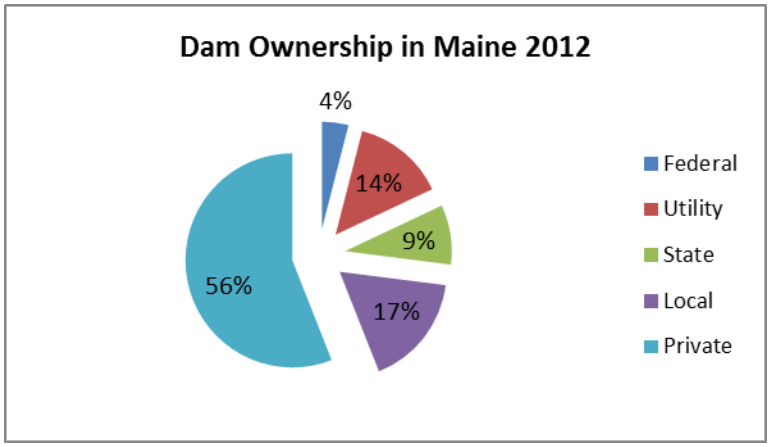
Grade: D+

Overview

Maine has over 1,000 registered dams of which 153 are classified as high- or significant-hazard-potential. 131 federally regulated dams are in good repair. A majority of Maine's dams are low-hazard potential, do not generate revenues and are more than 50 years old. Half of Maine dams are the responsibility of private owners. Maine's Dam Safety Program, spends much less than the other Northern New England states, and is understaffed and has no enforcement division.

Background

Maine has over 1,000 dams registered with the Maine Emergency Management Agency (MEMA). Maine's dams range from small, simple structures to larger to modern hydropower (power-generating) dams. The Federal Energy Regulatory Commission (FERC) regulates 131 of these dams. The New Hampshire Department of Environmental Services regulates 51 dams, which can impact Maine streams and rivers through common watersheds. A total of 250 dams are not regulated or classified. MEMA regulates 618 dams and can order a dam owner to repair, maintain or operate a dam in a particular manner. These orders result from a safety inspection by MEMA's State Dam Inspectors (SDIs).



There are 73 dams owned by state agencies including Inland Fisheries and Wildlife (IF&W), Department of Conservation (DOC) and the Department of Transportation. Of those, six are significant-hazard-potential dams - four owned by IF&W and two owned by DOC - with the rest being low-hazard-potential dams.

Condition and Adequacy

Maine's dam hazard classification system is based on the nationally accepted United States Army Corps of Engineers hazard classification system [(i)]. Of the 618 state-regulated dams, 30 are classified as high-hazard-potential dams, 77 are classified as significant-hazard-potential dams and the remaining 511 dams are classified as low-hazard-potential [(ii)].

In accordance with state law, all high-hazard-potential and significant-hazard-potential dams have to be inspected every two and four years, respectively, to determine their condition. Low-hazard-potential dams do not require condition inspection but are required to have a verification of their hazard potential completed every six years. The SDIs provide inspection for all state-regulated dams. FERC-regulated dams are inspected by FERC engineers or independent engineers.

Most Maine dams are more than 50 years old, with some being even more than 100 years old, and are showing signs of gradual deterioration. Typically, FERC-regulated dams generate revenue for their owners, which can then be used to fund repairs and maintenance. Generally, these dams are in good condition and are safe. However, continual deterioration of most state-regulated dams is a cause for concern. Maine's high-hazard and significant-hazard dams are in fair condition and continue to be monitored. The remaining 500-plus low-hazard dams receive little attention and are in generally poor condition.

Once a dam is classified as significant-hazard or high-hazard, the owner has to file an Emergency Action Plan (EAP) within six months and update that plan every two years. EAPs are kept on file with MEMA to be used during a dam incident. Additionally, MEMA's Maine Dam Safety Program (MDSP) manages the EAPs for 43 FERC-regulated dams. Most high-hazard-potential and significant-hazard-potential dams are regulated by FERC. In the last six years EAP compliance for state regulated high-hazard dams has risen to 100% and for significant-hazard dams is at 96%. Enforcement actions are underway against owners of the remaining four percent of dams that do not have EAPs. According to state law, each owner that is out of compliance with EAP requirements can be fined.

Some of Maine's challenges related to dam regulation and safety are associated with the inadequate number of personnel for inspection and difficulty in enforcing the inspection findings. Additionally, there is no unified record-keeping system.

Based on the SDI's report, the Commissioner of the Department of Defense, Veterans and Emergency Management, under whose jurisdiction MEMA falls, is empowered by the law to issue an order for lowering the lake level of a dam or repairing a dam. Costs associated with the implementation of the order are the responsibility of the dam owner. This can be a serious economic issue for owners of non-revenue producing dams.

An example of the difficulties involved in implementing and enforcing a dam safety order is the case of a privately-owned significant-hazard-potential dam in Bowdoin in 2007. The order stipulated control of the dam's lake level and a remedial action plan to be prepared. In this case, owners were unable to pay for professional services for the latter and the matter remains unresolved. In another example, in 2006 in Canton, another significant-hazard-potential dam in poor condition threatened homes and roads. Due to the condition of the dam, the order required gates to be removed to lower the lake level, thus impacting shorefront properties. The town at that time, assumed ownership and has installed a temporary sandbag dam to increase water level back to normal. The temporary dam is considered a low-hazard-potential dam and is not subject to the dam safety order.

Dam integrity assessments can, in some cases, be conservatively performed using physical observations without incurring major expense. Some regulated dams though do not have detailed construction records, therefore, making it difficult to assess their structural integrity and safety conditions without comprehensive investigation. The National Dam Safety Program and Association of State Dam Safety Officials (ASDSO) have developed the *Model State Dam Safety Program* to assist state officials with their state dam safety programs. From ASDSO: "The model outlines the key components of an effective dam safety program and provides guidance on the development of more effective and sustainable state programs to eliminate the risks created by unsafe dams. It contains chapters on Legislative Authorities, Permitting, Inspection, Enforcement, Emergency Action Planning and Response, Education and Training, and Public Relations". A study from ASDSO showed that in 2010, Maine's inspection program compliance with the *Model State Dam Safety Program* for inspection was 16.7%, compared to the national average of 74%.

The importance of registration, routine inspection and maintenance is illustrated by recent dam failures. For example, two previously unregistered dams failed during floods in April 2008. The first, Meserve Dam, caused $100,000 in damages while the second, Shorey Brook Dam, caused little damage. In March 2010, a portion of the

Colcord Pond Dam in the Oxford County town of Porter failed, following two days of heavy rain damaging roads and disrupting traffic. This dam has since been repaired.

Dam removals occur for many reasons. Consideration should be given before removing a dam to plan for upstream scour due to faster moving water especially during heavy rain events where the impoundment no longer stores the water, as well as upstream slope stability.

Levees

Though not dams, levees are an important asset to the communities they protect. Levees are flood protection structures, i.e. embankments built to prevent the overflow of a river. In May 2008, heavy rainfall combined with snow melting, pushed the St. John and Fish rivers to record levels until they overflowed their banks, flooding homes and businesses in Fort Kent, Maine. More than 600 of Fort Kent's 4,233 residents were evacuated. Aroostook County was declared a Federal disaster area. Nevertheless, the downtown business district and apartments were protected by a 35-year-old earthen levee which came within inches of being breached. A report, "Living Behind the Levee, Fort Kent, Maine: Knowing the Threat (and) Anticipating the Vulnerability," issued in early 2010 warns of the levee's potential weaknesses. The National Levee Database of the U.S. Army Corps of Engineers (USACE) lists five levees in Maine: one in Old Town, one in Fort Fairfield, one in Hartland Sebasticook River LB, one in Hartland Moose Creek Bypass, and one in Fort Kent. These structures were constructed between1976-2001 and are operated and maintained by their respective municipalities, except for the Penobscot River project in Old Town, which is operated by the Penobscot Indian Tribe. USACE inspects these structures annually.

Investment Needs

In Maine, dam safety and liability, as well as the financing for their maintenance, upgrade and repair, is the responsibility of the dam owners. MEMA's MDSP historically has been understaffed. Furthermore, there is no enforcement division. At present, MEMA has funding for two SDIs. In the past, Maine had one permanent inspector. Currently, the second position has had a high turnover rate and is not always available.

The MDSP is funded by the state and federal government. Based on the 2010 budget for state regulated dams, which was approximately $59,000, Maine ranks among the bottom five states in the nation. The annual MDSP budget is less than similar programs in either New Hampshire or Vermont. In 2010, according to the Association of State Dam Safety Officials (ASDSO): Vermont, which has less than 75% the number of state-regulated dams as Maine, spent more than 3.5 times as much on its dam safety program. New Hampshire, which has more than 1.30 times the number of state-regulated dams as Maine, has a budget of more than 12 times greater for its dam safety program. The present budget does not appear to change the rank of Maine's MDSP compared to those of the previously mentioned New England states.

In 2007, according to ASDSO, Maine has 17 high-hazard dams owned by public entities that require an estimated $11.9 million in repair costs. Only $2 million in funding was being considered for Maine from the National Dam Safety Program from federal legislation passed by the House of Representatives in October 2007 and again in 2012. As of October 2012, the Senate had yet to enact the legislation.

Conclusions and Recommendations

According to ASDSO's *Guidelines for the Model Dam Safety Program*, Maine's current staffing levels for the MDSP are inadequate. Considering the age of the state's existing dams, the demand for comprehensive and intensive safety inspections is on the rise. Even with a second dam inspector, MDSP personnel will still not be able to provide the necessary level of inspection and enforcement of dam safety orders.

Currently, the inspection system does not provide quantitative evaluation or grading data about dam functionality or the likelihood of a failure. Incorporating such data into the inspection process would improve dam evaluation procedures and help in the development of dam improvement and repair programs.

The state owns approximately 5% of the entire dam inventory in Maine, and does not have a budget for maintenance for most of those dams. In most cases, only limited resources are available for meeting the needs of municipal- and privately-owned dams, as well. Private and municipal dam owners have difficulty completing the repairs and improvements required by the state through dam safety orders.

Maine ASCE gives dams a grade of **D+.**

Maine ASCE makes the following recommendations:

- Increase the staff and budget levels for MEMA to accommodate current and projected inspection needs. Funding must be increased to almost three times the current level to be in line with the budgets of other New England states, and to almost six times the current level to keep up with annual inspections and implementation of dam safety orders, as mandated by state dam safety law;
- Develop a long-term strategic program and plan that includes: identification of possible funding sources; addresses the needs to investigate, repair, upgrade and operate the aging state, municipal and privately owned dams; and increases accountability of dam owners;
- Develop a program of State Public Awareness on dam importance, dam safety and consequences of their failures;
- Work with Maine's Congressional delegation to persuade the Senate to enact the Dam Rehabilitation and Repair Act to fund the National Dam Safety Program and address the most critical non-federal public dams; and
- Improve the record keeping system. Unification of data from different agencies will help concentrate dam safety, operation and maintenance under one oversight organization or department.

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(i)

HAZARD POTENTIAL CLASSIFICATION (USACE: ER 1110-2-106, 26 Sept 1979)		
Category	**Loss of Life (Extent of Development)**	**Economic Loss (Extent of Development)**
Low	None Expected (No permanent structures for human habitation)	Minimal (Undeveloped to occasional structures or agricultural)
Significant	Few (No urban development and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry, or structures)
High	More than a few	Excessive (Extensive community, industry, or agriculture)

(ii) Changes in the number of state-regulated dams from the 2008 report card are the result of dam removals and reclassification following inspection

2012 Report Card
FOR MAINE'S
Infrastructure

Issued December 6, 2012

ENERGY

GRADE: C+

Overview

The overall health of Maine's electricity infrastructure has improved slightly since 2008. Maine's extensive and diverse generation mix allows Maine to be a provider of electricity and renewable energy credits to the region. Most weak transmission links and interface limitations identified in 2007 are currently being addressed by the $1.4 billion Maine Power Reliability Program, which will be complete in early 2015. Additional maintenance and capital investments are still needed to address the system's age.

Background

Maine ASCE's 2008 Energy Report Card provides a general background of Maine's electric infrastructure growth over the last approximately 120 years, including construction of the bulk 345 kV transmission backbone constructed approximately 40 years ago and implementation of ISO New England (ISO-NE), the region's independent system operator and regional transmission organization.

Current Condition and Adequacy

Generation - Figure 1 represents Maine's 1998 to 2010 actual generation levels and mix of generation sources from its over 95 independently-owned generation facilities[i]. Maine transitioned from a net exporter of electricity in the early to mid-1990s to a net importer with the closing of the Maine Yankee nuclear power plant in 1997. The deficit has been restored starting in 2000 with new gas-fired generation units coming on-line. In 2009, Maine ranked 43rd and 44th among the 50 states in total electricity consumption and generation, respectively.[ii] Regionally, Maine ranks 3rd of the six New England states in annual generation, and currently offers approximately 10% of New England's total generation capacity while accounting for only 8% of New England's consumption.[iii] Maine's consumption of total energy on a per-capita basis is relatively average, ranking 23rd in the nation.[ii]

In 2011, total generation capacity in Maine was approximately 3,500 Megawatts (MW) (compared to 3,300 in 2007) with peak demand at 2,100 MW.[i] As of January 2012, Maine has a summer peak capability of 4,430 MW available from 111 total producers.[iv]

Prior to the closing of the Maine Yankee nuclear power plant in 1997, nuclear power represented approximately one-third of Maine's power generation. Natural gas generation was as high as 73% in 2002,[v] falling to 50% in 2006[vi] and staying at 49% in 2010.[i] Between April 2011 and April 2012, Maine reduced its oil and natural gas consumption for electricity generation by 48% and 44% respectively, compared to the national reduction of 31% and 36%.[vii] [viii] These reductions are anticipated to be a reflection of demand-side load reductions and increased reliance on renewable generation.

Maine is now one of 19 states without nuclear generation capacity and one of eight states with insignificant coal-fired generation.[ix], [x] This spares Maine from the large-scale generation retirements that some other states are facing trying to comply with evolving environmental regulations and upcoming nuclear licensing renewals.

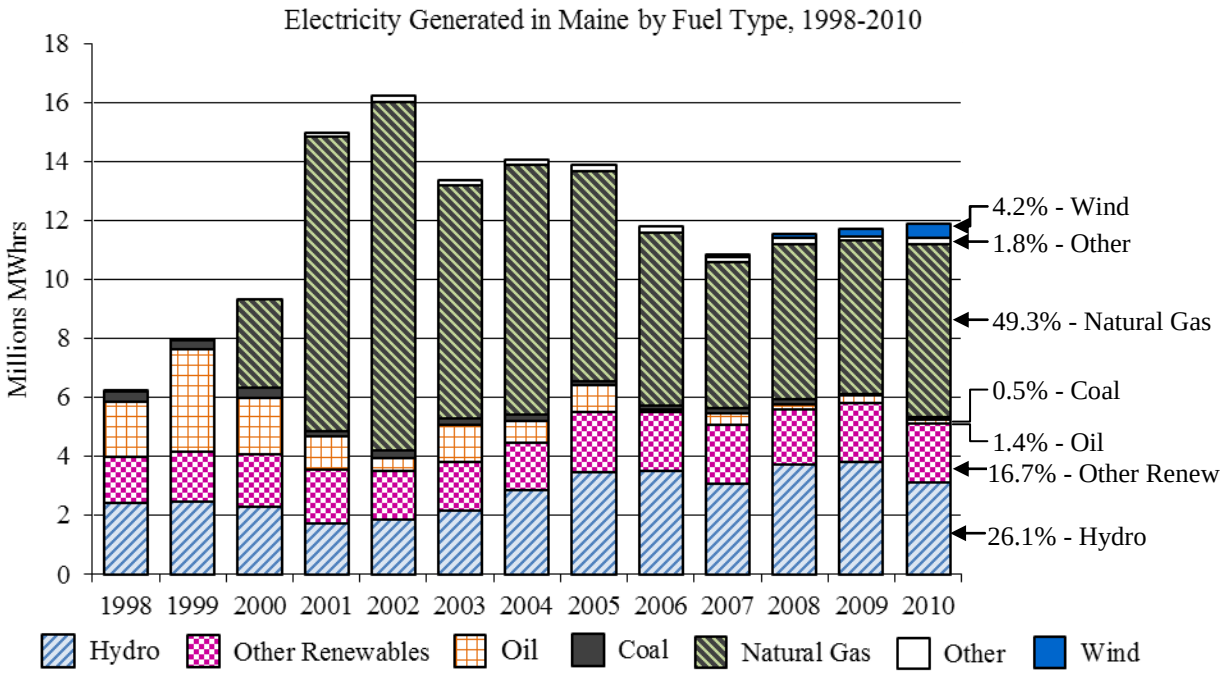

Figure 1: Electricity Generated in Maine by Fuel Type, 1998-2010

In 1999, Maine became one of the first states in the region to adopt a Renewable Portfolio Standard (RPS). This RPS required Maine to maintain a 30% share of the market for existing renewable energy capacity resources. LD 1920 was subsequently enacted which requires Maine to increase this RPS with new renewables annually 1% per year up to 10% by 2017.[xi] This bill requires competitive electricity providers to meet this portfolio standard through renewable energy certificates (RECs) or alternative compliance payments. Maine's compliance with RPS requirements has been met almost completely through the acquisition of RECs.[xi] Over 80% of Maine's Class I (new renewables) RECs were produced within the State of Maine with biomass being the major resource from 2008 to 2010.[xi] Hydroelectric represents the major compliance resource for Class II (existing renewables). Renewable resources located in Maine contributed significantly to new RPS compliance in other states, such as Connecticut and Massachusetts, accounting for over 30% of New England's new RECs in 2009.[xi]

As of October 2009, Maine ranked first in the U.S. generating electricity from non-hydroelectric renewable resources, and first in the U.S. generating electricity from wood and wood waste.[xii] Maine's 2010 total renewable summer generation of 7,963 MW-hr represented 47% of the state's total consumption during that period, ranking Maine 11th in the U.S. in this metric.[xiii] Maine is currently New England's largest renewable energy producer with 95% of operating wind capacity, 36% of hydro, 20% of biomass, and 50% of wind projects under development in the region.[xiv]

The Wind Energy Development Act, enacted in 2007, set a goal of 2,000 MW of wind power generation installed statewide by 2015, 3,000 MW by 2020, and additional goals for 2030.[xv] As of March 2012, Maine has eight operating large-scale wind energy facilities with a total capacity of 346 MW (compared to 42 MW in 2008)[xv], exclusive of non-utility "community" scale wind projects. Two more wind projects are currently under construction for an additional 85 MW, plus 14 more projects that are either planned or proposed totaling an additional 1,057 MW. [xv] However, many of the planned and proposed projects are contingent upon extension of the federal Production Tax Credit. Wind represented 4.5% of Maine's total energy generation in 2011.[xvi] Maine has met 17% of wind energy goals of installed capacity to date; the percentage would rise to 45% if these currently planned and proposed wind projects are financed, permitted, constructed and operated.[xvii] The Governor's Office of Energy and Independence and Security (OEIS) recommends eliminating the statutory goal of 2,000 MW of installed wind

capacity by 2015, since it is highly unlikely that level of installed capacity will be achievable. However, the statutory goals for 2020 and 2030 were retained until a comprehensive re-assessment can be completed. [xvii]

In 2010, MPUC issued a request for proposals for long term contracts involving deep off-shore wind and tidal energy pilot and demonstration projects in response to the Ocean Energy Act, with initial proposals being submitted by May 2011.[i] Several proposals were received and MPUC is in the process of evaluating them and negotiating with the bidders. Ocean Renewable Power Company's (ORPC) tidal demonstration project in Cobscook Bay was granted the first U.S. tidal purchase power agreement with connection to the grid in April 2012. The 150 kW facility began commercial operation in September of 2012.[xviii] ORPC plans to expand with additional installations up to a total of 5 MW after the initial project. Offshore wind generation continues to make technical progress.

The Northeast Power Coordinating Council (NPCC) establishes standards for generation and transmission system reliability. The resource adequacy reliability criterion is a loss of supply expectation of 0.1 days per year or one day per ten years for both the reference (baseline peak with 50% chance of being exceeded) and high (extreme peak with 10% chance of being exceeded) demand load forecasts.[xix] The New England region experienced record electricity use on August 2, 2006, when consumer demand peaked at 28,130 MW due to above average temperatures and humidity.[xx] This event triggered ISO-NE to implement several standard operating procedures which included delivery of electricity sales from outside their operating region and summoning of demand resources, with little to no impact on consumers. Electricity demand approached this record on July 22, 2011 at 27,707 MW. [xxi]

ISO-NE forecasts that in 2015, 33,456 MW of power resources will be needed under the baseline peak load forecast to meet NPCC's resource adequacy reliability criterion—a 4% increase from 2010. [xxii] The 2012 Forward Capacity Market auction qualified a total of 38,601 MW of resources to participate in the auction—a 1% increase from 2010 qualification. 36,309 MW were cleared at the end of the auction which is well above the forecasted baseline peak demand. This forecasting indicates that there is sufficient power generation capacity in the ISO-NE system to meet demand over the next several years. [xxiii], [xix]

Transmission and Distribution - Maine is served by three investor owned utilities: Central Maine Power Company (CMP), Bangor Hydro Electric Company (BHE), and Maine Public Service Company (MPS), in addition to a number of consumer owned utilities (cooperatives). The state's largest cooperative is the Eastern Maine Electric Cooperative (EMEC). Figure 1 of the 2008 Energy Report Card shows the service territory of the major electric transmission and distribution utilities in the state.

The majority of Maine's transmission system is located in the more populated southern portion of the state, and is owned and operated by CMP and BHE, and is administered by ISO-NE. The southern Maine transmission system interfaces with New England via multiple 345 kV and 115 kV lines at the New Hampshire border. The more rural eastern and northern areas of Maine are serviced by MPS and EMEC, which comprise the Northern Maine Transmission System (NMTS) and are administered by Northern Maine Independent System Administrator (NMISA). The NMTS is connected to the New Brunswick Power (NBP) transmission system and not directly connected to the energy market in southern Maine and the rest of the United States. The NBP transmission system connects to Maine via two 345 kV transmission lines, one of which is owned and operated by Maine Electric Power Company ("MEPCO"). MEPCO is jointly owned by CMP, BHE, and MPS. [xxiv]

While Maine has multiple 345 kV transmission paths, there is a gap, with only a single path between southern Maine and the Bangor area. This is a critical weak link, creating the potential that a single 345 kV line outage or double circuit tower failure could result in separation of major portions of Maine and eastern Canada from the rest of New England. [xi] The Maine Power Reliability Program (MPRP) will address this weak link upon its completion.

In 2010, Maine established a smart grid policy and MPUC initiated an investigation to define the technologies, system, and functions of a smart grid; analyze the feasibility of implementing and operating the system; and assess the need for a grid operator. As part of MPUC's approval of CMP's MPRP, a pilot plan was established for smart grid and a non-transmission alternative by CMP and GridSolar respectively in the mid-coast and Portland areas.[xxv] As of June 2012, CMP has installed 623,000 out of 624,000 smart meters and are completing the final components

of the Automated Metering Infrastructure (AMI) network.[xxvi] GridSolar is pursuing a pilot project to test whether non-transmission alternatives can improve grid reliability at a lower cost and with less environmental impact than new transmission line construction. Their Boothbay area project was approved in May 2012 and their Camden/Rockport project is under consideration by MPUC.[xxvii]

Investment Needs

A large part of the transmission and distribution system in Maine is more than 40 years old. If Maine is to maintain efficient, cost-effective energy generation sources and a robust transmission and distribution grid that meet regional reliability standards and environmental emission regulations, significant interconnection investments are still needed in addition to the major project commitments currently underway.

The long-term system needs of BHE and CMP were identified in 2007. The largest improvement project is the MPRP which is a series of projects designed to meet reliability requirements and be consistent with long-term planning objectives in both the BHE and CMP service territories. The MPRP is a $1.4 billion project on CMP's bulk transmission system, which includes a second 345 kV path from the Bangor area to southern Maine, installing additional parallel transmission paths and transformers, six new substations, and many upgrades to existing transmission lines, substations, and transformers.[xxviii] This project encompasses 13 of 16 counties in Maine. The MPRP was approved by MPUC and granted a certificate of public convenience and necessity in 2010. As of June 2012, 1,825 of 5,260 transmission structures have been set, 112 of 442 miles of transmission lines have been strung, one of six new substations has been commissioned, and two of five 345kV autotransformers have been delivered. [xxix] The project is expected to be completed in early 2015.[xxx]

The Maine Power Connection (MPC) project would invest $625 million to interconnect the northern MPS transmission system with southern Maine, and subsequently connect the planned 800 MW Aroostook Wind Energy Project to the U.S. electric grid. However, this transmission project was dismissed by MPUC in 2009 due to discovered technical issues with the connection to the grid to the south. Aroostook Wind Energy also foresaw immediate financial market challenges and withdrew from the project for now.[xxxi]

Other recently completed and on-going transmission and distribution reliability projects include: [xxx], [xxxii]

- $61 million Downeast Reliability Improvement, currently under construction and planned in-service date of late 2012;
- $100 million in new and rebuilt 115 kV transmission planned and partially started in eastern and central parts of the state;
- The Keene Road 345kV/115kV substation was completed in 2010, along with rebuilt 115 kV transmission lines in 2011, to improve the performance of the BHE system;
- CMP has planned 115 kV expansions in western Maine to address area thermal and voltage issues;
- Upgrades north of Augusta and near Rumford will help reduce potential voltage concerns; and
- System reinforcements at 115 kV, including the addition of the new substation at Maguire Road in southern Maine, are helping to serve southern Maine load in the near term.

Major elective transmission projects include: [xxx]

- The 345 kV tie-line in northeastern Maine in conceptual planning; and
- Several merchant high voltage, direct current (HVDC) projects, which are in conceptual, proposed or planned stages, are designed to transmit renewable energy through Maine from Canada to the Boston area market. These competing projects are each estimated to cost $1 billion or more to permit, design, and construct.

Conclusions and Recommendations

The 34kV, 115kV, and pre-MPRP 345kV systems are all 40 to 60 years old and will continue to decline toward a reduced serviceability condition if not addressed. The energy generation, transmission, and distribution systems in Maine are in need of continued significant investment in order to ensure reliable, efficient, and cost-effective delivery of electricity. The overall health of the energy generation and transmission system in Maine has marginally

improved since 2008 with the introduction of new non-gas fired power generation facilities, construction of the front end portions of a major $1.4 billion transmission project, planning of other system reinforcements, and introduction of smart grid technology. However, until all of these projects are completed and commissioned, significant system reliability and security concerns still exist. Maine ASCE gives Maine's current energy infrastructure a C+.

Maine ASCE recommends the following:

- Continue to diversify power generation sources and expand renewable energy generation projects and research to meet the State's LD1920 Renewable Portfolio Standard compliance by 2017.
- Address regional transmission interface limits and reliability concerns by completing the construction and commissioning of the $1.4 billion MPRP and considering a future project similar to the $625 million Maine Power Connection to integrate the MPS system and future wind developments into New England.
- Address localized reliability concerns through transmission and distribution upgrades, particularly in the northern and western Maine areas.
- Continue inspection, maintenance, and upgrade of the electric system including smart grid technology in order to ensure reliability and security.

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MUNICIPAL DRINKING WATER

Grade: C+

Overview
An estimated two-thirds of Maine residents are served by 151 public community drinking water systems. Approximately $1 billion in water infrastructure projects is needed over the next 20 years. Federal and state funding for the last 10 years was approximately $22 million leaving a potential shortfall of over $500 million. While there has been improved funding for treatment, storage, filtration and security issues, the funding gap is significant, specifically in regard to aging distribution systems.

Background

In 2011, Maine had approximately 1,900 public drinking water supply systems, which range from large systems supplying entire communities to small systems that provide water to seasonal facilities such as campgrounds, hotels and restaurants. Two-thirds of Maine residents supplied by public water systems are supplied by a few large systems, such as those serving Portland, Lewiston/Auburn and Bangor, which use surface water sources. Most other public water systems use groundwater as their water source. A public water supply in Maine is defined as a system that supplies more than 25 people for more than 60 days a year. This brief is focused only on the 151 quasi-municipal community-owned water systems and public utilities. Comprehensive data is not available for other public water supply systems.

Water supply infrastructure includes source of water supply, watershed area or zone of influence that supplies recharge water, intake systems or wells and pumps, treatment plants, transmission and distribution systems, storage tanks and reservoirs, and administrative and laboratory testing facilities.

Condition and Adequacy

Water supply systems are vastly different as each has a different owner, varying numbers of customers, and treatment processes. While one system may have an intake in a lake, use slow sand filtration and pump to a reservoir on a mountain before distribution through WWII-era pipes,[i] another may have three sand and gravel wells, need little more than disinfection, and be sent to a storage tank connected to brand new piping. For these reasons, comprehensive data for conditions do not exist.

Some systems are constructing upgrades specifically designed to improve performance and reliability. For example, many water systems are constructing redundant wells, and/or interconnections with neighboring systems. Other recent system upgrades have focused on meeting new treatment requirements, covering storage facilities, securing supply sources and new plant and process improvements to reduce disinfection by-product.

Aged underground transmission lines remain a serious issue for Maine's water utilities. Annual water main replacement rates for the last 10 years, average approximately 0.7% for larger systems and 0.9% for smaller systems. These represent replacement cycles between 110 and 150 years. The target is a minimum of 1% that would keep all mains less than 100 years old. Recent examples include:

- Leaks in South Portland highlight the type of damage that can be caused by a single water main. Because water is pressurized in the system, a single break can cause significant flooding issues. [ii] In this case, the Portland Water District investigated the leaks but was not able to determine a single cause for the series of leaks. The break that caused damage to several businesses on Broadway was in a line installed in 1900.
- A six-inch cast-iron line feeding the primary fire suppression system in L.L. Bean's flagship store in Freeport ruptured in early October. According to an official at the Maine Water Company, "*It was just age that did it, we found no other explanation for why it broke. Without a problem on it, there really wouldn't be a reason to replace it before today.*"[5.]

- Also recently, a main that was over 60 years old closed temporarily closed two businesses in downtown Farmington.[7]

Despite variations in facilities, regulatory oversight of Maine's public systems is firmly rooted in the Safe Drinking Water Act. The 1996 amendments to the Safe Drinking Water Act require states to implement strategies to ensure that new public water systems have sufficient capacity to meet federally mandated drinking water requirements. In Maine, the Safe Drinking Water Act is enforced by the Drinking Water Program or DWP. A primary responsibility of the DWP is oversight of compliance with and enforcement of United States Environmental Protection Agency (EPA) National Primary Drinking Water Standards. [iii] The DWP is part of Maine's Department of Health and Human Services (DHHS) and has a staff of approximately 32 to conduct compliance, enforcement, field services, and revolving loan fund administration, thereby monitoring drinking water security, capacity development and source water protection. Additional information on drinking water standards was included in the 2008 Report on Maine's Infrastructure.

In addition to the DWP, the Source Water Protection Program (SWPP) was established in 1998 to protect Maine's drinking water sources and to provide additional protection to public water supplies. Source protection focuses on protecting the water supply before contamination occurs by delineating recharge areas, inventorying land uses within recharge areas, evaluating potential hazards and communicating protection strategies to the public. This program is ongoing in nearly all PUC regulated systems.

Security

The DWP received approximately $200,000 (DWP 2012) during the last five years for security planning and training through the EPA and the Department of Homeland Security. With that funding, DWP personnel provided training, developed emergency response plans, and created templates for public water systems to develop their own plans. DWP personnel also conducted tabletop exercises and emergency response plan training, as well as internal coordination with other state agencies regarding safety. Additionally, funding was given for a series of public service announcements on water system security. Some water systems received portions of the EPA money and some of the funding, earmarked for safety and security, was routed to county emergency management agencies. DWP funded fencing and other security measures for wells and associated structures through wellhead protection grants.

Funding Sources

The 1996 Safe Drinking Water Amendments authorized the EPA to set up grant funds of one billion dollars per year through 2003. This federal money serves as the basis for funding the Maine Drinking Water Program (DWP) locan program for capital improvements. (Ref. 1) Since 1997, the program has provided over $168 million in loans and grants to public water systems in Maine.

Additional funding for public water systems is provided by the United States Department of Agriculture Rural Development Authority for systems with less than 4,000 customers, or for communities with less than a total population of 10,000.

All municipal water departments have the option of using taxes and user fees for capital projects, or to repay loans. All private utilities and all quasi-municipal water districts are regulated by the PUC. Property taxes pay a portion of public water system maintenance by way of public fire protection fees to municipalities. These typically reflect between 10% and 15% (with some as high as 25% for small water systems with a high fire protection need) of total water system operational cost.

Non-project activities such as source water protection programs, technical assistance to small systems, a land acquisitions, system planning and wellhead protection are also funded from portions of the federal grants. (Ref. 1)

Most funding for drinking water system maintenance and upgrades is provided through loans provided by the Drinking Water State Revolving Fund (DWSRF), generally available as low interest loans. Although a small

number of projects receive grants that do not have to be repaid, most projects are funded by loans that must be repaid through user fees. Principal forgiveness may be awarded to Disadvantaged Community Water Systems. .

80% of new funding for the DWSRF is from Federal funds. Maine must provide a 20% match for Federal funds. This match is required to maintain the revolving loan fund and the DWP continues to search for options to provide adequate matching funds. Important steps were made towards this end in the 2011 Legislative Session when the legislature "approved using up to 15% of the renewed wholesale liquor contract revenues to provide the state match for the DWSRF for the 10-year period between 2014 and 2023. (Ref. 4)

Matching funds have not been secured for the next two years. Traditionally Maine has utilized bonds to fund the 20% match required to secure federal funds to support the DWSRF budget. In November 2012, the Maine voters approved a $7.9 million bond referendum for water and wastewater infrastructure. The current outlook is that the use of voter approved bonds in 2013 is unlikely (Ref. 6). MaineASCE is concerned that without replacement funds from other sources, up to $40 million in federal matching grants for water infrastructure will be lost.

Flexibility in funding for local systems for capital reserve accounts and infrastructure assessments was addressed during the spring, 2012 Legislative Session via LD 1820, An Act to Implement Recommendations to Provide Additional Flexibility for Funding Infrastructure Improvements for Water Utilities. Rulemaking will take place in the summer of 2012 and provisional rules will be submitted to the Legislature in the following session for final approval.

The DWSRF is administered by the Department of Health and Human Services DWP and the Maine Municipal Bond Bank (MMBB), with the DWP responsible for technical support and MMBB providing financial oversight (Ref. 1). The MMBB floats bonds which are purchased by private investors. Benefits of the MMBB include

- Backed by general taxation authority of state, which lowers risk to private bond buyers and therefore lowers interest rates
- Consolidates numerous small loans into larger loans, thus lowering transaction costs for borrowers and investors
- Makes "bond package" more attractive to investors since they are doing business with a well established government-backed borrower.

Investment Needs

Safe and abundant water is critical to human health, sustainable development and economic growth. The DWP estimates that hundreds of millions of dollars worth of necessary water projects remain unfunded due to shortfalls in both state and federal budgets. While Congress has mandated improvements in both water quality standards and in sewage treatment, federal funding for water infrastructure in Maine has increased only slightly over the last 3 years compared to the 10 year average funding for the DWSRF. Funding from the DWSRF in 2011 totaled $15 million, while requests for funding in this same year were approximately $42 million, a shortage of approximately $27 million. The 2009 stimulus funding approximately doubled typical annual funding levels.

The Maine DWP has analyzed PUC reports over the period 2001-2011. During that period, the value of system infrastructure increased by $465 million, or nearly 50%. Much of that investment was in new plant to meet new treatment requirements. While larger utilities replaced water mains at a rate of 0.7% per year, these same utilities also experienced a 6% growth in total main length (often funded by developers) over the ten year period, despite a decrease in demand averaging 16% over the period. For many utilities, this resulted in significant upward rate pressure, with an average annual increase of 5%. A few utilities have to doubled rates to pay for needed improvements.

The table below, compiled from several sources, summarizes the funding available since 2003, as well as priority projects that did not receive funding (waitlisted) in a given year.

Year Amount, millions	2003	2004	2005	2006	2007	2008	2009[1]	2010	2011	Ave. median
DWSRF Grant from Federal Funds	8.2	8.0	8.8	8.2	8.3	8.1	$27.6[1]	$13.5	$9.4	11.1 8.3
20% State Matching Funds for DWSRF	1.6	1.6	1.8	1.6	1.7	1.6	1.6	$2.7	$1.9	
Total	**$9.8**	**$9.6**	**$10.6**	**$9.8**	**$10.0**	**$9.7**	**$29.2**	**$16.2**	**$11.3**	
USDA - Rural Development Funding	*	*	*	*	*	*	20.0[1]	9.87	3.16	
CDBG Funding	*	*	*	*	*	*	.5	.61	.98	
Total	*****	*****	*****	**13.4**	**14.7**	**15.0**	**49.7**	**26.7**	**15.4**	**22.0**
Waitlisted	*	*	*	11.4	12.8	7.5	$89.6	$27.2	$27.1	

[1] Includes ARRA stimulus funds. ARRA brought a number of water systems into the DWSRF , as all systems were eligible for forgiveness. The increase in requests for projects has continued, although not at the level of 2009. Maine was the 5th state in the nation to complete all projects funded by the ARRA stimulus funds, completing these projects in 2011.
[2] Starred data not available at time of publication

Conclusions and Recommendations

The drinking water grade applies to the 151 publicly funded water systems. Many of the underground facilities for drinking water are more than 100 years old. Recent main breaks and leaks have highlighted the critical nature of underground distribution lines, which impact Maine ASCE's assessment of a lower grade despite improvements in other areas of water supply systems. No systems are known to have gross violations of the Safe Drinking Water Act. Most systems are in full compliance, and provide high quality water to customers. No uncovered storage tanks or unprotected unfiltered surface water systems remain. No water borne disease outbreaks have been attributed to these systems since the early 1980s. Aside from line leaks or breaks, system failures are extremely rare, even when storms occur. Many systems have implemented significant improvements in security, and treatment upgrades. During the period 2001 to 2011, approximately $465 million was invested in system infrastructure to meet new treatment requirements. However, aging infrastructure is not being replaced at an adequate rate in many systems. Without increases in rates or public funding, repairs will not catch up to need. Since release of the 2008 report, additional funding sources have been added to Maine ASCE's assessment, however overall funding remains below need. Overall, Maine ASCE gives drinking water a grade of C+.

Maine ASCE makes the following recommendations:

- Support state efforts to release or secure funding for Maine's 20% match for federal funding via the bond issue passed in the November election, or other sources.
- Support the 2011 Legislature's funding mechanism through the wholesale liquor contract for the approximate $1.8 million DWSRF state match.
- Continue to work with the federal government and Congress to fully fund the needed projects and eliminate the waitlist. Congress needs to provide $1 billion annually; $1 billion on a national basis means $10 million for the Maine DWSRF.
- Increase cooperation among funding agencies (MMBB, USDA-RD, CDBG, DWSRF, CWSRF).
- Assess and monitor the potential impacts of proposed Federal Legislation, WIFIA (Water Infrastructure Finance and Innovation Authority) a proposed new program for funding water infrastructure through the Treasury. Assess and monitor potential impact in Maine of National Infrastructure Bank. Compare to DWSRF and MMBB model currently in effect.

- Support a reliable funding mechanism, such as the existing DWSRF/MMBB model that provides both low interest loans and grants for infrastructure investment. Support the MMBB and its efforts to provide low interest bonds to consumer owned water facilities.
- Implement full cost pricing and educate public as to the importance of sustainable operations, promote greater self-funding.
- Require periodic review of water system user rates for sufficiency to meet infrastructure replacement needs
- Advocate for collaborative efforts among water systems for sharing of resources, equipment and personnel to reduce operating costs, and/or regionalization of utility management and systems.
- Require active asset management programs be implemented and reviewed annually to maintain the terms and conditions of grants or loans; and require updating of Comprehensive System Facilities Plan (CSFP), a plan that typically includes analysis of source water, consumption trends and projections of future needs, modeling of existing distribution systems and future improvements to meet domestic and fire flow demands. Continue educating utility staff in asset management programs.
- Investigate the condition of underground lines and storage facilities

[i] WWII-era piping was installed when high quality materials were in short supply. Maine's environment provides more than adequate sources of supply. However, the infrastructure components that make up public water systems require continued and adequate funding. Storage, treatment and distribution facilities require maintenance, replacement and upgrades to meet current drinking water standards. The greatest need may lie out of sight in underground lines, many of which are more than 100 years old. Sources of supply also need funding for protection from pollutant and security threats.

[ii] http://www.pressherald.com/news/water-main-breaks-plague-city_2012-09-08.html

[iii] http://www.epa.gov/ogwdw000/standard/setting.html "The Safe Drinking Water Act (SDWA), passed in 1974 and amended in 1986 and 1996, gives the Environmental Protection Agency (EPA) the authority to set drinking water standards.

Sources:

1. Maine Drinking Water Program Website: http://www.maine.gov/dhhs/mecdc/environmental-health/water/financial-resources/srf.htm
2. http://maine.gov/dhhs/eng/water/
3. DHHS, Drinking Water Program, and Maine Municipal Bond Bank, Drinking Water State Revolving Fund, (DWSRF) 2011 Intended Use Plan. http://www.maine.gov/dhhs/mecdc/environmental-health/water/financial-resources/2011srf/FINAL%202011%20DWSRF%20Intended%20Use%20Plan.pdf
4. Annual Report of the Maine Public Drinking Water Commmission. http://www.maine.gov/dhhs/mecdc/environmental-health/water/dw-commission/documents/annualreport2011.pdf
5. http://bangordailynews.com/2012/10/04/news/portland/water-pipe-feeding-l-l-bean-flagship-store-in-freeport-breaks-closing-main-street/
6. http://bangordailynews.com/2012/09/29/politics/maine-ballot-to-include-transportation-other-bonds-2/
7. Kennebec Journal, January 30, 2012. Aging water systems pose huge challenges.

Maine CDC Drinking Water Program, Maine Dept. of Health and Human Services, Maine Water Utilities Association, Portland Water District, and A. E. Hodsdon Consulting Engineers.

MUNICIPAL WASTEWATER

Grade: D+

Overview

Maine's 2008 Clean Watersheds Needs Survey listed an estimated wastewater infrastructure need of $1 billion. The primary source of funding is the Clean Water State Revolving Loan Fund (CWSRF). CWSRF funding is stressed and projected to decrease in coming years. As a whole, the wastewater industry business model of funding capital projects is not sustainable. The lack of funding for infrastructure investment and proper maintenance adversely affects Maine's ability to protect the public health.

Background

Maine cities, towns, and utility districts are facing a significant challenge to repair and upgrade old or failing infrastructure in their wastewater collection and treatment systems. These entities support a population of 1.33 million citizens that earn on average $46,933, the lowest average annual income in New England.[1] Limited financial resources and other community demands have postponed, delayed, and neglected the repair, upgrade, and modernization of infrastructure that is a vital component of a community's public health, environmental stewardship, and economic vitality. In conjunction with the need to rehabilitate a significant portion of the existing infrastructure, federal and state regulatory requirements on wastewater and stormwater are becoming more restrictive. These increasingly strict conditions and effluent limits are designed to reduce pollutant loads on receiving waters. As identified in the 2008 Report Card, stormwater pollution has become a concern to regulatory agencies with communities, utilities, private and public entities in the preliminary stages of stormwater management efforts.

Wastewater infrastructure can be broken down into two primary categories: (1) Publicly-Owned Treatment Works (POTW) facilities; and (2) collection systems comprised of pipes, manholes, pump stations and other subsurface components that convey the wastewater to POTW facilities. Collection systems that collect and carry both stormwater flow and sewage are combined sewer systems. Combined sewer systems (CSS) are common in older collection systems in the larger towns and cities in the State. These combined sewer systems are designed with hydraulic relief points to protect downstream assets – usually the treatment plant. In addition to downstream protection, the hydraulic relief points also provide protection for upstream public infrastructure and private property, i.e. backups. When stormwater overwhelms the combined system capacity, the hydraulic relief points discharge a portion of the untreated wastewater directly to a receiving body. This overflow is referred to as a combined sewer overflow (CSO). In addition, the surge of wastewater to the treatment facility prior to and during CSO events is often disruptive to the treatment plant and can cause short-term compliance issues. Separation of stormwater from sanitary wastewater by creating separate stormwater sewers has been a regulatory priority for many years, beginning with the publication of the National CSO Control Strategy by the Environmental Protection Agency (EPA).

The CSO movement started with the clarification of the Clean Water Act through the publication of the National CSO Control Strategy by the EPA in 1989. Separation of sewers that carry both wastewater and stormwater has become a major area of investment for many of the larger municipalities in Maine. There has been positive progress in CSO reduction in many communities in Maine with an estimated 80% reduction in annual statewide CSO volume since 1989.The separation of stormwater creates a separate discharge that can contain significant pollutants washed off during rain events and is addressed through the Clean Water Act permitting process called the National Pollutant Discharge Elimination System (NPDES) permits as well as other state-delegated stormwater management programs. Increasingly communities in Maine and across the nation are turning to storage of combined wastewater in order to address combined sewer overflows and also to minimize discharges of polluted stormwater.

[1] U.S. Census Bureau, 2010 data.

Portland which has the largest CSO volume, accounts for about 44% of the CSO volume in Maine. Portland has significant work remaining to address this issue. Portland is projecting $170 million in direct capital need over the next 15 years to address the next round of CSO reduction work. This work is primarily to increase storage in the combined system. Phase one of this work is beginning November 2012.

These projects are projected to significantly increase sewer rates for local ratepayers. The increased sewer rates are proposed to be incorporated into a Stormwater Utility, which will levy both CSO abatement costs and a new storm water runoff management fee to equitably distribute costs to Portland landowners. The overall utility investment, regardless of how it is funded, is expected to be the largest municipal infrastructure investment in the city's history. This approach has been implemented at several CSO communities nationwide.

Bangor, Auburn, Augusta and Lewiston continue to make significant investments in CSO abatement, and have also implemented or proposed utility funding mechanisms. 28 communities (including most of those discussed previously) are regulated for stormwater discharges under the state's delegated NPDES Municipal Separate Stormwater Sewer System (MS4) general permit and face increasing requirements for asset management, discharge reduction and pollution prevention. MS4 permits, which are re-issued every 5 years, are expected to obligate communities to the EPA's Capacity Management Operations & Maintenance (CMOM) program, which sets drainage collection and treatment system requirements, resulting in further implications on funding. Communities, like Portland, have determined that $2 to $4 million per year will be required to simply maintain and operate their drainage collection system given useful life and condition ratings. The City of Lewiston already collects stormwater utility fees to offset the rising costs of maintaining stormwater infrastructure and complying with increasing regulatory obligations, and the City of Bangor is scheduled to begin collecting stormwater fees by June 2013 as a self-sustaining stormwater funding source.

Condition and Adequacy

Wastewater infrastructure got a boost in Maine in the 1930s when Civilian Conservation Corps projects led to the development of the earliest systems. The second leap in development of municipal wastewater infrastructure was in the 1970s and 1980s in response to the Clean Water Act and the subsequent funding programs that provided generous grant funding for building wastewater collection and treatment facilities. According to the 2011 Status of Dischargers report, there are 163 POTWs around the state. Through the years, widespread economic growth has expanded developed areas in Maine (both in land area and population), increasing the demand on the existing POTWs. Now many communities are faced with the reality of maintaining an infrastructure that is over 30 years old and in many cases may be approaching or exceeding its design life and unable to achieve the increasing effluent limitations. Funding opportunities for these communities is largely loan-based though the CWSRF program. There are other funding opportunities as described previously.

Many larger communities in the state have completed one or more upgrades of their treatment processes; however, a much larger percentage of facilities, generally in the smaller, more rural communities, have had little or no upgrades. Federal and state funding for these communities has not been available due to the low number of users and the relative high cost per user to repay the necessary loans. Local user fees are typically designed to cover operating and regular maintenance costs and do not address the need for major renovation or replacement. The low average annual income of ratepayers prohibits the payment of high user fees to support the upgrades and replacement of aging infrastructure.

In addition to the treatment facilities, communities face additional challenges with their aging collection systems. In many systems stormwater and groundwater is able to enter the collection systems through unintentional openings like cracks and holes in the pipes and structures. This infiltration and inflow (also referred to as I&I) adds additional flow to the system, and sometimes accounts for a large percentage of the system's capacity and can be a contributing factor to Sanitary Sewer Overflow (SSO) events. Without repair of the collection systems, the full effect of other downstream repairs won't be achieved. Rehabilitation and replacement needs will be an ongoing financial challenge for many communities and will be required through the NPDES permitting process as those permits are now including Asset Management and CMOM principles. These requirements will require communities to put these principles into practice and will require resources and financing to do so. The expected long term effect is this will help communities achieve sustainability in operating these important infrastructure systems in future years.

Investment Needs and Funding Sources

According to the 2008 Clean Watersheds Needs Survey (the most recent results available), which was conducted by the Maine Department of Environmental Protection (DEP) and submitted to the EPA, the total wastewater funding need in Maine is $1 billion. According to the data, approximately 84 communities are waiting for funding assistance for a variety of upgrade projects with total project costs estimated in 2008 at over $433 million. CSO issues continue to be a problem, and abatement of CSOs is a costly endeavor. To date, Maine CSO Communities have reported expending $415 million implementing their CSO abatement projects since 1989. In the 2011 Annual CSO Progress Reports submitted to the State, these communities reported expending almost $34 million on abatement work. It is estimated that the future needs of these communities to complete their CSO abatement plans totals $340 million.

In recent years, the Efficiency Maine Trust has provided grant funding to organizations in Maine including wastewater treatment facilities. The trust provides wastewater treatment facility owners with cash incentives and/or competitive grants to achieve electrical power and energy savings. From 2007 through 2011, 29 wastewater projects received a total amount of $689,032 in grants. The Lewiston-Auburn Water Pollution Control Authority (LAWPCA), for example, received $330,000 to partially fund the purchase of biogas fueled micro turbines. In another example, Freeport Sewer District received $275,000 to partially fund the $1.2 million upgrade of the plant aeration system.

Funding for the necessary investment in infrastructure improvements has primarily come from the CWSRF, Rural Development (RD), Community Development Block Grants (CDBG), other grants and commercial loans and bonds. CDBG programs are based on a community's median household income, as compared against other Maine communities, as well as other considerations including current and anticipated user fees. In most funding packages, grants are a small part of the total funding. The CWSRF provides interim funding for projects at an interest rate of 3% and provides long term loans, up to 20 years, at an interest rate that is 2% below the current market rate at the Bond Bank. RD offers a mix of loans and grants, but in recent years the loan portion has dominated the financing package. RD loan rates are slightly more than SRF long term rates. RD rates are currently 2.125% to 3.5%. RD can only service communities with a population of 10,000 or less. It is not uncommon for public infrastructure projects to have participation from multiple agencies and resources to obtain the level of funds necessary to finance infrastructure and facility improvements.

From 2010 through 2012 the SRF program provided $20,000 of loan principal forgiveness for communities to conduct a one-time comprehensive treatment facility energy audit. A total of 12 energy audits were approved during the project ranking periods, amounting to $240,000. All submitted loan applications were approved. The application deadline for FY2013 Intended Use Plan has passed and all funding allotments have been made with no funding available for additional audits. Pending the final passing of the next federal CWSRF appropriation and appropriation language, there may be additional principal forgiveness to fund energy audits in the future. Under the current House budget, there would be no funding available.

Traditionally, Maine has utilized bonds and federal matching funds to fund the majority of its CWSRF budget. The current outlook is that the use of voter-approved bonds in 2013 is unlikely. This will include suspending borrowing $40 million previously approved by voters for wastewater and water infrastructure improvements as well $7.9 million approved in 2012. The amount approved in 2012 will qualify for a federal match of $39.6 million. However, without replacement funds from other sources, $39.6 million in federal matching funds for Wastewater and Water infrastructure investments associated with this proposed borrowing will be delayed or lost.

The capital investment needs for the wastewater treatment facilities and conveyance systems, stormwater management programs, and water recycling programs are greater than allocated funding. The needs represent the capital investment necessary to plan, design, build, replace or rehabilitate publicly-owned wastewater treatment and collection facilities, eliminate CSO discharges and establish and implement stormwater management programs. The total loan amount available for 2012 is $59 million. The CWSRF program will remain a major component in funding wastewater projects; however, it is expected that reduction in federal funding resources will decrease the resources of the SRF program in coming years. In 2013, RD is hoping to be funded to the level of funding in 2012 which was a $9.8 million loan and $4.2 million grant.

Conclusions

The most influential factor preventing consistent investment has been the setting of user rates and fees. Since the Clean Water Act legislation was adopted, regulation has existed that requires local utilities to set user rates to allow maintenance and capital investment. Unfortunately, the rates are rarely set high enough to achieve the intended goal. In some instances, the funds have been directed to other projects. This has led to a dependence on borrowed money through SRF and grant programs. In addition, the needs based assessments that direct a portion of the flow of loan and grant money can favor poor behavior, directing money to systems that are in dire need of repair and upgrade because of a lack of investment in capital and maintenance. As a whole, the wastewater industry business model of funding capital projects is not sustainable. The industry must educate their users on the true cost of the services and benefits provided by this essential infrastructure. The industry must invest in people and planning to determine true costs to run and maintain their facilities and set rates accordingly.

Communities need to invest in determining the condition of system assets and developing asset management plans and multiyear capital improvement plans that consider their future plans and the condition of their collection and treatment system assets. Basic asset management principles based on asset condition and criticality could then be used to create a risk-based plan that prioritizes and schedules capital projects over many years. These plans in conjunction with operations, maintenance and contingency planning budgets will allow communities to set rates necessary to operate and maintain their wastewater facilities.

The need for low interest money and grants for communities will continue. Good planning will help sustain low interest loan and grant programs as they face continued pressure and the likelihood of reduced funding in future years. By insuring that each community is properly planning capital expenditures and maximizing their ability to self-fund through sustainable rate structures, these funding programs will be extended for those most in need.

The State of Maine wastewater industry and wastewater industry stakeholders need to explore new means to direct low interest money and grants to those most in need. One idea is to set up a State Clean Water Infrastructure Trust. This approach has been taken in the State of Minnesota This State run Clean Water Fund is financed through sales tax revenue. The lack of funding for infrastructure investment and proper maintenance adversely affects Maine's ability to protect the public health. The condition of Maine's wastewater infrastructure suffers from declining conditions, decreasing reliability, limited capacity for future growth, security issues, environmental stewardship concerns and sustainability problems. Current federal, state and local funding levels are insufficient to support existing funding requests for major upgrades and CSO separation. No major effort has been undertaken to understand collection system conditions and that the actual need is substantially larger than identified, and that environmental impact will continue to increase. Maine ASCE gives municipal wastewater a grade of **D+**.

Recommendations

Maine ASCE makes the following recommendations:

- Work with federal government and Congress to fully fund the CWSRF program and reduce the list of needed projects.
- Work with State officials and legislators to explore the creation of a reliable funding mechanism, such as a federal or state infrastructure trust fund that would provide both low interest loans and grants for infrastructure investment. The availability and access to sufficient and economic attractive funding resources would help utilities most in need make the necessary investments to their systems
- Encourage communities and utilities to implement full cost pricing and educate the public as to the importance of sustainable operations. Determination of realistic full cost pricing will be aided by the establishment of a well devised capital spending plan.
- Make it a DEP requirement for a utility to implement an active Asset Management Program as a condition for eligibility for the receiving low interest loans and grant. This would be an escalation of the current 2012 policy in the Clean Water State Revolving Fund Federal Fiscal Year 2012 Final Intended Use Plan (IUP), that encourages the establishment of Asset Management Programs by providing 5% to 10% loan forgiveness if a borrow establishes an Asset Management Program and a Reserve Fund.
- Encourage all utilities to invest in a multiyear Capital Improvement Plan based on condition and criticality assessments of the wastewater collection and treatment system assets. The work conducted in order to establish a well devised Asset Management Program is foundational to developing a well devised multiyear capital

improvement plan. This could be incentivized by ME DEP similar to current CWSRF incentives for providing an Asset Management Programs and a Reserve Fund.

- Advocate the consolidation or regionalization of utilities throughout the state to reduce operational costs.

Sources:

Maine Department of Environmental Protection Clean Water State Revolving Fund Federal Fiscal Year 2012 Amended Intended Use Plan (IUP), Document No. DEPLW1220-B-2012
Maine Department of Environmental Protection report to the 123rd Legislature "Status of Licensed Discharges and Combined Sewer Overflow Abatement Program" dated April, 2011
Maine Department of Environmental Protection "Maine Wastewater Facilities Needs" dated January 2008
Maine Department of Environmental Protection 2008 Clean Watershed Needs Survey dated January 2008
Maine Department of Environmental Protection
http://bangordailynews.com/2012/06/12/politics/lepage-refuses-to-sell-bonds-even-those-already-approved-by-voters-until-2014/

SCHOOLS (PreK-12)

Grade: C-

Overview

Maine schools face a $1.7 billion capital funding gap based on current state funding programs. Less than half of priority health and safety project requests have been funded over the past 12 years; some projects have had repeated requests. School consolidation has resulted in closure of some deficient schools.

Background

Maine has 623 public schools with an enrollment of approximately 187,000 pupils, from pre-kindergarten through 12th grade. The school facilities are local community centers and sources of pride. They are generally well maintained and use the available funding well. Enrollment statewide decreased 10.9% between October 2005 and October 2011. Enrollment in the more populous counties (York and Cumberland) has decreased less than 5% during this same period. The shrinking student population can be attributed to the state having the nation's oldest median age.[1] In the future, secondary enrollment in grades 9-12 is expected to shrink, while the elementary school population is expected to rise slightly in the next 5 years, notably in the southern part of the state. Infrastructure funding for school systems is provided by two sources: local government which provides approximately 51% and the state government which provides approximately 49%.

Condition and Adequacy

School facilities have many infrastructure components such as water supply (potable and fire protection), wastewater disposal, parking lots and energy. School infrastructure has a direct impact on students' health, particularly indoor air quality. Common public utilities are often not available to serve rural schools, mostly drinking water and wastewater disposal systems. The rural districts also have high costs due to the extensive transportation required for students.

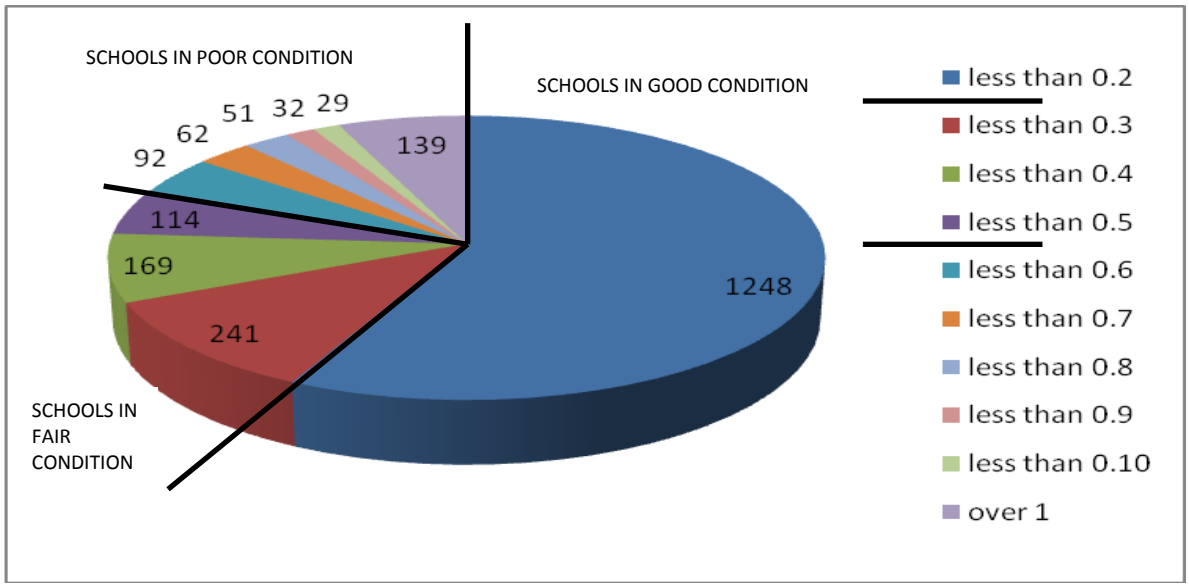
Maine's school facilities have been historically evaluated by various state-appointed Task Forces[2] or academic research institutions, but in the last 14 years the evaluations have been by the Maine Department of Education (DOE), using two databases. Individual analysis of school facilities has been done with a Capital Management Database (CAM) since 1998; in 2009 this was absorbed into a new database, the School Facilities Management System (SFMS), with 66.4% of administrative units using the system in 2011, up from 52% in 2008. The school systems not using this system are generally smaller schools with limited administrative staff which are not requesting capital funding from the DOE. The SFMS database is used for asset management and planning purposes. The SFMS database uses a Facility Condition Index (FCI), which is an industry standard for measurement of the relative condition of assets. The FCI is obtained by looking at the cost to bring an asset into good condition and dividing that cost by the current replacement cost of the asset. The higher the FCI ratio is, the poorer the condition of the asset. An FCI of 1.0 or over identifies an asset that has exceeded its useful life and should be replaced.

The Maine DOE requires that all deficiency requirements be used in the calculation of the FCI regardless of the timing of the necessity. Short-term and long-term requirements are grouped together. There are 2,177 records in the SFMS database. Of the school assets in the SFMS database, 93.6% had an FCI of 1.0 or less, 3.2% improvement from 2008.

[1] *Sun Journal* article dated September 3, 2008 quoting David Connerty-Marin, Maine Department of Education
[2] 1998 Governor's School Facilities Commission Task Force

The pie chart depicts the FCI distribution within the SFMS database. As can be seen from the pie chart, 57.3% of the records have an FCI of 0.20 or less, which is considered in "good condition" by the Maine DOE; this value was 45% in 2008 with less schools reporting to the database. Of the total records in the SFMS database (including those with an FCI greater than 1.0), approximately 18.6% of these records have an FCI greater than 0.5, which indicates these are in need of attention.

Chart 1: FCI Distribution within SFMS Database



Issues of primary concern represent 20% of requirement costs in the database with an associated cost totaling $335 million. The balance of the corrective measures is likely to require implementation in the immediate to near future, thus there is an anticipated future need of $1.3 billion.

The DOE recommends that the local districts plan on spending 2% of their operational budgets on infrastructure maintenance and repairs. However, this is not mandated.

Investment Needs

In 1998, the School Revolving Renovation Fund (SRRF) was created by the Maine State Legislature to provide funding through loans or grants that would contribute to safe, healthy and adequate school facilities through renovation or major capital construction projects. The SRRF has four major categories:

- **Priority 1**. This category is limited to health and safety projects. Specifically, Priority 1 addresses roofs, Americans with Disabilities Act compliance, air quality, asbestos and other health and safety issues.
- **Priority 2.** This category covers projects that are not health and safety related. These include infrastructure issues, windows, doors, water and septic systems.
- **Priority 3.** This category is limited to energy and water conservation projects. This priority was added in 2011.
- **Priority 4.** This category is limited to the upgrade of learning space. This was "Priority 3" prior to 2011.

Priority 3 and 4 projects are expected to be funded by bonds; funding is no longer available in the SRRF, per the Maine Legislature due to the economic climate. Further, in this funding cycle, no funding has been allocated for Priority 2 projects. There are $20-$30 million in requests expected and $10 million in available funding, all for Priority 1 projects. Further, there is a maximum of $1 million in funding per priority per school, every five years.

Major capital construction projects generally involve major renovations or new school facility construction. Selection for this is a rigorous process including strict site selection requirements. The current selection process format has been in place since 1999 and has gone through four rating cycles between 1999 and 2011. Projects are ranked by the Maine DOE and presented to the Maine State Board of Education for funding approval. During the

four funding cycles, approximately $976 million dollars of projects were funded, representing the state and local allocation. In the 2004-2005 cycle, the average project cost was approximately $26 million. The six projects for the latest cycle are in the planning phase. The cost of construction in 2005-2008 exceeded any typical planning forecasts due primarily to materials cost increases. The subsequent economic climate slowed the construction costs.

From 1999 to 2011 there were 1123 requests for SRRF projects in four funding cycles. Of these requests 947 were Priority 1, 128 were Priority 2 and 48 were Priority 4. Of the 947 Priority 1 requests, 432 (45.6%) totaling just under $120.8 million were funded. Of the 128 Priority 2 requests, 56 (43.8%) totaling $17.6 million were selected. Of the 48 Priority 4 requests, 32 (66.7%) were selected totaling $13.3 million. Since 1999, the SRRF program has only funded 46% of the requests. Some projects have been requested more than once. Between 1999 and 2011 the SRRF program funded $151.7 million out of $307.2 million of requests; this represents a funding level of slightly over 49% of the requests during that time frame.

During these four funding cycles, 301 major capital school construction applications were received and rated. As of 2012, 60 projects had been funded. Of the 301 applications, 175 applications were first time applications and 126 applications were repeat applications. As of 2012, there were 67 projects that remain unfunded that are likely to reapply in future cycles; future cost for these projects is unpredictable at this time. Using the average cost of $26 million per project, the potential outstanding needs in 2012 dollars would exceed $1.7 billion. Some additional projects have been locally funded without state subsidy; no information has been collected on these projects by the DOE.

Continuation of this trend suggests that the current infrastructure deficiencies are not getting adequate funding and, thus, will continue to burden the school administrative unit with deficient facilities. The SFMS is adequately identifying infrastructure needs but funding for those needs has not been provided.

Conclusions and Recommendations

The Maine Legislature has empowered the Maine DOE to mandate facility and asset management reporting with the SFMS database, which has provided a means for assessing the infrastructure. Only 45% of priority health and safety project requests have been funded. The required level of needs identified exceeds what is currently allocated through the two primary means of dealing with school infrastructure: the SRRF and the Major Capital Projects program. Current funding levels show a gap of $1.7 billion in major renovations or new construction between the requested and funded projects. Many substandard and aging facilities have been addressed through consolidating school districts and moving the consolidated schools into new buildings. Many temporary classrooms and other substandard facilities are in use. Maine ASCE gives schools (PreK-12) a grade of **C-**.

Maine ASCE provides the following recommendations:

- Increase school participation in the utilization of the SFMS software for assessing and managing infrastructure needs;
- Increase debt service and bond cap levels to coincide with cost increases so that infrastructure project funding does not fall behind;
- Prepare and submit annual reports on the state of the school system which highlight achievements, outstanding funding requests, anticipated funding needs and completed projects; and
- Increase the visibility of maintenance funding in the school districts as a vital part of keeping the capital cost of the education infrastructure down.

Sources:

- Interview with Director, Maine Department of Education
- Interviews with Education Specialists and consultants at the Maine Department of Education
- http://www.maine.gov/doe/data/index.html, various public databases, regulations and commentary

SOLID WASTE

Grade: C-

Overview

Maine's solid waste disposal rate has declined since 2008; however, per-capita waste generation remains higher than the national rate. Recycling is stagnant and remains below state-established goals. Despite no new landfill capacity and closures of a commercial landfill and an incinerator, capacity exists to meet short term disposal needs; however, changes in policies and long term planning and investment are necessary to ensure that new disposal capacity is developed in a timely manner.

Background

In the late 1980s, the State of Maine enacted legislation that resulted in significant improvements to the way solid waste was managed. Since that time, solid waste management in Maine has continued to evolve, as the state strives to follow the hierarchy developed for disposal:

1. Reduction of waste generated at the source, including both amount and toxicity of the waste;
2. Reuse of waste;
3. Recycling of waste;
4. Composting of biodegradable waste;
5. Waste processing that reduces the volume of waste needing land disposal, including incineration; and
6. Land disposal of waste.

In the past two decades, the rate of recycling has more than doubled as public recycling services have been made available to nearly all of the State's population; toxic materials have been kept out of the waste stream by requiring recycling and special collection of certain hazardous materials like universal wastes; nearly all of the State's substandard landfills have been capped and closed to reduce their impact on the environment; and new landfills and expansions have been held to siting, design, and monitoring standards that help to protect the environment.

In accordance with the original legislation, periodic waste management plans have been developed, first by the Maine Waste Management Agency, and later by the Maine State Planning Office (SPO). The most recent plan entitled "Waste or Resource? Rethinking Solid Waste Policy" was issued by the SPO in 2009. The plan provided an assessment of current policies and a review of changes since the previous plan was issued ten years prior. The SPO has been responsible for gathering and reporting data on Maine's solid waste, and the 2009 plan included a summary of data through the previous years. In addition to the 2009 plan, the SPO issues annual reports on solid waste disposal. These reports summarize the results of facility annual reports to provide updated waste characterization, disposal rates, recycling rates, and capacity projections. The most recent report was issued in 2012, and contains data from 2010.

In 2012, in an effort to consolidate State government agencies, most of the solid waste management tasks previously under SPO jurisdiction were taken on by the Maine Department of Environmental Protection (DEP). The DEP's Bureau of Remediation and Waste Management will now contain a Sustainability Unit, which will be responsible for oversight of recycling, solid waste capacity, and other solid waste functions. In addition to solid waste, the group will be responsible for climate change, energy efficiency, and various topics related to sustainability. The DEP is optimistic that the new approach will allow for better decision making towards sustainability in Maine.

Condition and Adequacy

The condition of Maine's solid waste system was evaluated by comparing the State's waste generation rates to the available capacities for disposal – including landfill, incineration, and recycling.

MSW Generation Rates: In 2010, the SPO estimated that Maine residents and businesses generated 1.7 million tons of municipal solid waste (MSW), including bulky waste like construction and demolition debris. This equates to approximately 7 pounds per person per day. The United States Environmental Protection Agency (EPA) reports MSW without including bulky waste. Using the EPA definition of MSW, 1.4 million tons of MSW was disposed of in 2010, or about 5-1/2 pounds per person per day in Maine.

This disposal rate in Maine remains 30% higher than the national rate of 4.4 pounds per person per day; however, the rate is down from previous years. From 2005 to 2010, the rate of disposal has decreased by nearly 12%. From 1993 through 2001, waste generation increased by 42%, but from 2003 through 2007 waste generation growth leveled off, with an increase of only 1%. Since that time, waste generation has decreased, reflecting the economic downturn that began in 2008.

3Rs (Reduce, Reuse, Recycle): Maine's legislative goal was to achieve a 50% MSW recycling rate by January 1, 2009. Based on the most recent data from 2010, this rate has not been achieved, with only 38.7% of MSW recycled. However, this represents a slight increase over the prior five years, but Maine's recycling rate has remained relatively consistent, and under 40%, since 2001. Based on the EPA definition of MSW (excluding bulky wastes), the recycling rate in Maine was 44.3%, in comparison to the national rate of 34.1%.

The 2009 SPO waste management plan addressed why the state-established 50% recycling goal has not been met and made recommendations on how to achieve this goal in the future. Looking ahead over 20 years, just to maintain a 35% recycling rate, public and private programs would need to double their recycling handling capacities, and to achieve 50%, this would need to increase even more. To accommodate this increase, there would need to be capital improvements made by municipalities and private recyclers, higher staffing expenditures, and increased efforts to promote recycling to bring in the material to process. This promotion is currently ongoing throughout the state in the form of public education campaigns, emphasis on the ease of recycling with new technologies, and incentives like pay-as-you-throw, but further work will be necessary to ensure that there is enough waste to make improvements economically viable, and a higher recycling goal feasible.

Volume reduction (incineration): Until 2012, there were four Waste-To-Energy (WTE) facilities in operation in Maine:

- ecomaine (formerly Regional Waste Systems), Portland;
- Maine Energy Recovery Corporation (MERC), Biddeford;
- Mid-Maine Waste Action Corporation (MMWAC), Auburn; and
- Penobscot Energy Recovery Company (PERC), Orrington.

Note that the ecomaine WTE facility is separate from the ecomaine single-sort recycling facility. In July 2012, the Biddeford City Council voted to purchase and close the MERC facility, ending years of uncertainty on the future of the facility. The SPO's most recent published data on the WTE facilities is from 2010, and still includes data from MERC.

MERC and PERC utilize refuse derived fuel technologies (whereby the waste is processed prior to incineration), while the ecomaine WTE facility and MMWAC are mass burn technologies, which does not include waste processing prior to incineration. The four facilities produce approximately 62 megawatts of electricity.

In 2010, 35.4% of Maine's MSW was sent to a WTE facility. The total for 2010 represented a decrease of nearly 18,000 tons from the previous year. Of the total 856,941 tons of waste, 562,347 tons originated in state, and 294,594 was from out of state. Importation of waste is necessary to allow the WTE facilities to operate at an efficient burn rate in the incineration units. Bypass waste, front end process residue, and ash from the WTE facilities are all landfilled. In 2010, approximately 325,000 tons of these WTE residues were disposed of in landfills.

With the closure of MERC, the available capacity at Maine's WTE facilities will decrease. In 2010, MERC accepted 284,718 tons of waste, including 98,758 tons of in-state waste, and 185,960 tons of imported waste. It is anticipated that in-state waste that previously went to MERC will be processed in southern Maine, and will be transported to the

Juniper Ridge Landfill in Old Town for disposal without incineration, thereby consuming 2 to 3 times more disposal volume.

Landfilling and Disposal Capacity: In 2010, Maine's solid waste landfills included one state-owned landfill, one commercial landfill, ten municipally-operated landfills, and about 20 municipal construction and demolition debris (CDD) landfills. Several processing facilities/operations were also available for managing construction and demolition debris.

Twelve landfills accepted the majority of waste generated in Maine in 2010, including municipal waste, CDD, and ash from the four WTE facilities. Of the 12 landfills, six (Bath, Brunswick, Greenville, Hatch Hill in Augusta, Presque Isle, and Tri Community in Fort Fairfield) are municipally owned and are used primarily to dispose of MSW generated in the member communities; two (Lewiston and ecomaine in Portland) are municipally owned and operated by regional entities to dispose of residue from two of the WTE facilities; one (Crossroads in Norridgewock) is privately owned and accepts MSW and special wastes; two (Rockland and Mid Coast in Rockport) primarily accept construction and demolition debris; and one (Juniper Ridge in West Old Town) is owned by Maine, with its operation subcontracted to a commercial solid waste company.

In 2009, the Pine Tree Landfill in Hamden closed, and waste that used to be disposed of at that facility is now diverted to Juniper Ridge in Old Town. In its last year of operation, the facility accepted 413,207 tons of solid waste, including cover materials. Of that, 117,995 tons was MSW, CDD, and processing residues generated in Maine.

Municipal landfill closures have been continuing in the past few years. In 2008, the Caratunk, Forks, West Forks Landfill (CFWF) was closed. In 2007, its last year accepting waste, the facility only landfilled about 1,000 tons of waste. In 2012, the landfill in the Town of Greenville will be closed. This facility represented only 1,824 tons of capacity in 2010. These municipal closures and others in the future represent only a small impact on statewide capacity, but can have significant local impacts on municipalities which must find and fund other disposal options for their MSW.

With the 1989 ban on new commercial landfills, the legislature tasked the SPO with siting and developing new disposal capacity for Maine for MSW and special waste, depending on the needs identified through the SPO's periodic disposal capacity projections. In the 1990s, the State permitted a landfill on a site in the unorganized territory of T2 R8, outside of Lincoln, which is known as the Carpenter Ridge site. This permit is held in reserve in case Maine's estimated disposal capacity becomes less than six years. At that time, the SPO (or the acting solid waste authority) is required to notify the legislature and provide recommendations regarding construction and operation of the Carpenter Ridge facility. The anticipated capacity of this facility is not included in the SPO's most recent capacity projections. In addition, planned, but unpermitted capacity increases for the state-owned Juniper Ridge Landfill are no longer included in capacity projections.

In 2010, the SPO estimated that between 2010 and 2030, 22.6 to 25.7 million cubic yards of landfill capacity would be required to adequately dispose of the State's solid waste and the residue from its WTE facilities. Considering 2010 fill rates, applying no adjustments, and considering only the currently permitted landfill space, at the end of 2030, only 3.1 million tons of capacity will remain.

However, these waste generation projections, as well as the disposal capacity projections were based on the following assumptions which greatly impact capacities:

- Only the current waste disposal rates were assumed, with no adjustments in projections to account for fluctuation in waste generation or recycling rates that would be expected to increase over the long-term;
- Consistent annual waste to energy capacities were assumed, with no change accounted for over the 20 year span; this assumption is already incorrect as it included the MERC facility which was closed in 2012;
- The Carpenter Ridge landfill was maintained as undeveloped, and Juniper Ridge expansions as unpermitted.

Conclusions and Recommendations

Solid waste management has improved due to 1980s legislation and external influences since that time, resulting in:

- Enhanced protection of public health and the environment through the closure of obsolete facilities, reduction of toxics in the waste stream, and strict regulations governing solid waste facilities;
- Increased public awareness of solid waste issues and infrastructure;
- Development of new technologies, most notably single sort recycling;
- Achievement of reasonable recycling rates that are greater than the national average; and
- Provision of adequate disposal capacity based upon today's generation rates.

The economic slump during the past four years has resulted in disposal rates decreasing for the first time since the mid 1990s. While this reduction is a short term benefit, it can also represent a long term uncertainty. During the same four-year span, there has been no increase in landfill capacity and one WTE facility is slated to closure.

Today, the state's solid waste management system is adequate. However, to maintain adequate disposal capacity into the future, a number of issues need to be addressed:

- Solid waste generation rates remain higher than national levels;
- Recycling rates have stagnated and recycling goals have not been achieved;
- The loss of disposal facilities (capacity) has not been offset by expansions or new facilities;
- The responsibility for solid waste management planning at the state level has recently changed; and
- Though policy decisions are made at the State level, solid waste management is still the responsibility of and funded almost entirely by municipalities. Thus, state policy makers must consider the costs to local tax payers for solid waste management, yet strive to maintain environmental protection, especially as disposal facilities close and disposal options in some areas of the state become more limited.

Maine ASCE gives solid waste a grade of C-.

Maine ASCE makes the following recommendations:

- Continue state support to municipalities to enhance local solid waste management programs, with emphasis on cost-effective reuse and recycling, and support of household hazardous waste collection;
- Promote waste reduction, recycling, and beneficial reuse of waste products. This should include incentives for solid waste service providers for the development of new technologies, enhanced and new beneficial reuse of waste, and new markets for recyclables;
- Continue to review and update Maine's solid waste policies to reflect technological advances made in the solid waste industry, current or present-day public opinion, and current management policy, as well as Maine's variations in population density, waste generation rates, and type of waste generated;
- Respond to annual updates of the solid waste plan and capacity projections in a timely manner, recognizing the long time necessary for permitting and constructing additional (disposal) capacity; and
- Ensure that changes to solid waste management planning at the state level do not result in lost momentum.

Sources

- Code of Federal Regulations (CFR) Title 40: Protection of the Environment; Part 258 – Criteria for Municipal Solid Waste Landfills;
- Maine Revised Statutes Annotated (MRSA) Title 38; Chapters 13 (Waste Management) and 24 (Solid Waste Management and Recycling);
- Report entitled "Solid Waste Disposal Capacity Report for Calendar Year 2010," prepared by the Maine State Planning Office for the Joint Standing Committee on Natural Resources of the 123rd Legislature, and dated January 2012;
- Report entitled "Solid Waste Disposal Capacity Report for Calendar Year 2009," prepared by the Maine State Planning Office for the Joint Standing Committee on Natural Resources of the 123rd Legislature, and dated January 2011;
- Report entitled "Waste or Resource? Rethinking Solid Waste Policy – State of Maine Waste Management and Recycling Plan," prepared by the Maine State Planning Office, and dated January 2009.
- Fact Sheet entitled "Municipal Solid Waste Generation, Recycling, and Disposal in the United States: Facts and Figures for 2010," prepared by the United States Environmental Protection Agency, dated December 2011.
- Article entitled "Biddeford council votes to close MERC," by Gillian Graham for the Portland Press Herald, dated July 18, 2012.
- Web site of the Waste Management and Recycling Program of the Maine State Planning Office, http://www.state.me.us/spo/, accessed October, 2012;
- Web site of the Bureau of Remediation and Waste Management, Maine Department of Environmental Protection, http://www.maine.gov/dep/waste/index.html, accessed October 2012;
- Maine DEP "Update on New Duties," email dated June 19, 2012.
- 2010 Maine Census

STATE PARKS

Grade: C+

Overview

State parks are a key component of tourism- Maine's number one industry. The condition of the infrastructure of Maine's 48 state park facilities is adequate. However, there has been little capital investment made since 2008 to help reduce maintenance backlogs, enhance the level of service and gain greater economic impact. The focus of limited funds available is primarily on health and safety improvements and there continues to be over $30 million in needed improvement projects.

Background

Maine's public recreation backbone consists of 48 state parks and historic sites. An even larger destination for hiking, camping, fishing and interacting with nature is provided by public reserve land and easements, which total nearly 600,000 acres[i]. These areas are managed by the Maine Department of Conservation (DOC) and its associated divisions. The state also has numerous municipal areas, a national park and other recreational activity areas, though they are not addressed in this brief.

As described in the 2008 Report Card, Maine's economy is heavily dependent on the tourism industry. Estimates indicate that 2.1 million people visit state parks and facilities and spend more than $60 million on goods and services directly related to their state park visits every year.[ii]

Investment Needs

In 2004, the DOC commissioned a study to assess the condition of state parks' major infrastructure assets and develop a recommended capital improvement program. This study enabled the DOC to establish an updated baseline for prioritizing infrastructure improvements to the system. The assessment covered all state park facilities, including more than 200 buildings and multiple site facilities, with an emphasis on assets that would likely require more than $15,000 each to renovate or replace. A comprehensive team of engineers, planners, landscape architects, surveyors and historical preservation consultants conducted the assessment and worked with the DOC to develop the capital improvements plan which identified $40 million in capital investment needs.

As reported in 2008, the DOC's Bureau of Parks and Lands (BP&L) contracted more than $5 million in critical need improvements for major sanitary projects to upgrade restroom facilities, as part of a larger $7.5 million bond. The projects include masonry repairs, sanitary system replacements and shoreline protection. This investment level was a good start and resulted in MaineASCE giving State Parks a B- in 2008.

After interviewing staff at the BP&L, the only notable additional funding since the 2008 Report Card was prepared was $500,000 as part of a state bonds issued in 2009. This limited funding was focused on health and safety related improvements, primarily for wastewater handling and treatment at park facilities. These represent the most fundamental needs of the State Park system and did little to reduce the overall backlog of over $30 million for estimated maintenance, reconditioning, rehabilitation and replacement that still exists. As reported in 2008 for at least a decade, the state's general fund has not provided BP&L with capital money for renovations and new construction.

Money from dedicated license plate sales and water extraction fees has only been sufficient to make minor improvements and to cover a portion of maintenance prior to 2008. Upgrades to the facilities—for sanitary systems, shelter, wayfinding and interpretive signage—are necessary to promote the areas, as well as to preserve the quality and natural existence of the resources. Without the maintenance of the recreational areas, the quality of the experience will be degraded and economic opportunity for the state will be lost.

Conclusions and Recommendations

There are no new additional studies identified since 2008 updating the details of condition or funding needs. The Department of Conservation does release annual reports which show no major increases in funding or major changes in condition.

Based on interviews and available information, this update assumes that the status and condition of state parks have not changed significantly since the 2008 Report Card, though without continued investment into the State Park's infrastructure a decline in condition is expected. The DOC continues to prioritize available funding based on most critical needs and managing any deferred maintenance or capital improvement needs to the extent practicable. The needs continue to outweigh the funding available and given four more years of this condition have passed since the last Report Card, the grade has slipped slightly from B- to C+.

Maine ASCE makes the following recommendations:

- Update the BP&L database to include recent investments and establish an updated baseline of where the inventory stands; and
- Evaluate fee structures to determine if any further optimization can be leveraged for support of funding key assets. User fees can potentially be leveraged further to assist with the funding process, resulting in a more sustainable infrastructure.

[i] March 2012 Department of Conservation 2011 ANNUAL REPORT to the JOINT STANDING COMMITTEE on AGRICULTURE, CONSERVATION AND FORESTRY MAINE PUBLIC RESERVED, NONRESERVED, AND SUBMERGED LANDS

[ii] June 2006 "The Economic Contributions of Maine State Parks: A Survey of Visitor Characteristics, Perceptions and Spending" University of Maine Margaret Chase Smith Policy Center

AIRPORTS

Grade B

Overview

Over the past four years, Maine's airport system has experienced a number of high profile improvements including twelve runway rehabilitation projects, two major terminal construction/expansion projects and numerous taxiway/apron rehabilitations, obstruction removal and other safety enhancements. Although Maine ranks last of the New England states in terms of federal grant expenditures per airport, the state's airport infrastructure is in good condition and has improved modestly.

Background

Maine is served by two small hub[1] commercial service airports, Portland and Bangor,[2] as well as approximately 180 Federal Aviation Administration (FAA) registered regional, municipal and private facilities located throughout the state[3]. However for this analysis, only the 35 publicly owned facilities are evaluated that are included in 2011 National Plan of Integrated Airport Systems (NPIAS)[4]. The other 100 plus facilities are almost exclusively privately owned and ineligible for federal funding. Herein, airports are described by '"Levels,"[5] depending on capabilities:

- Level I airports have at least one runway with precision approach capabilities.
- Level II airports have at least one runway with non-precision capabilities.
- Level III and IV airports are those with sufficient visual approach capabilities.

Commercial Service Airports – There are six airports in the state that provide scheduled commercial service: Augusta State, Bangor International, Hancock County- Bar Harbor, Knox County Regional- Rockland, Northern Maine Regional- Presque Isle, and Portland International Jetport.

Primary General Aviation (GA) Airports – In addition to the six commercial service airports, the 2002 Maine Aviation System Plan (MASP) identified three additional airports as Level I facilities including Auburn-Lewiston, Sanford and Waterville[6].

Secondary General Aviation Airports – For purposes of this analysis, the other 26 state system airports are categorized as "secondary." In the MASP, these facilities are described as Level II, III or IV.

[1] The term 'hub' is used by FAA to identify very busy commercial service airports as measured by passenger enplanements. Primary commercial service airports are grouped into four categories. Large hubs are those airports that each account for at least 1% of total U.S. Passenger enplanements; medium hubs for between 0.25% and 1%, small hubs for between 0.05% and 0.25%, and non-hubs for less than 0.05% of all enplanements, but more than 10,000 annual enplanements.
[2] Based on 2011 data presented in National Plan of Integrated Airport Systems (NPIAS).
[3] Airport Q 5010 Master Records and Reports, includes seaplane bases.
[4] Since completion of the 2008 Report, Brunswick Executive has been added as a NPIAS facility.
[5] Levels used to categorize state publicly owned airports were developed in the Maine State Aviation System Plan and are not recognized as an official descriptor by FAA or other national regulatory agencies.
[6] Brunswick Executive qualifies as Level I, but became active after the completion of the MASP. Five other GA airports also qualify as Level I since completion of the MASP.

Condition and Adequacy

In 2012, Maine Department of Transportation (Maine DOT) completed a comprehensive evaluation of FAA funded NPIAS airport runways, taxiways, aprons, airfield lighting, crack sealing, and pavement markings. Excluded from the study were Brunswick, Portland, Bangor and Islesboro. Of the 44 runways at 31 Maine airports, 20 runways were shown to have a Pavement Condition Index (PCI) rating[7] of very good to excellent (85>) including two runways currently under reconstruction. Thirteen runways were shown as fair to good (PCI between 70 and 84). There are six runways with a poor rating (PCI 60 to 69) and only two that are failing (<60). The average PCI runway rating has been held the same since the 2008 Report at 81.

For Level I airports to meet airside infrastructure requirements, there must be at least one runway with precision approach capabilities. The six Commercial Service and nine Primary General Aviation Facilities have this capability. Level II airports have at least one runway with non-precision capabilities. In review of MASP data, it appears that all 35 facilities reviewed also meet this objective. Over the past four years, a number of airports throughout the state have also benefited from the inclusion of LPV (localizer performance with vertical guidance) approaches providing better approach and departure procedures for pilots.

For landside facilities, such as hangar storage, MASP has benchmarked data for various level airports that indicates that Level I facilities have the largest shortfall. This is (was) driven by the lack of general aviation (GA) aircraft hangar storage at the Portland Jetport. A proposed GA complex on the airport's south side would have addressed this shortfall at that time. Since the 2008 Report, however, Portland Jetport officials have installed the basic infrastructure, but due to the poor economy the private developer pulled out. However, with Brunswick Executive now on-line, additional hangar space has been provided in converted military facilities adding new storage capacity at favorable rates. With the downturn in the economy and reduced GA activity in the state since the 2008 Report, hangar capacity has not been an issue, nor is it expected to be an issue in the short term (three to five years).

Airfield operational capacity is also not an issue for any Maine airports. MASP notes that only the Portland Jetport will approach 60% of airfield capacity (Annual Service Volume – ASV) by 2010.

As noted in the MASP, 35% of the state, from a geographical perspective, is within a 30-minute drive from a public airport. Approximately 98% of the state's residents live in this drive-time parameter. This percentage drops only slightly – to 90%– if further refined to the percentage of Maine residents within a 30-minute drive time from airports with charter services or scheduled service. That said, the two major airports in the state, Portland and Bangor, are not easily accessible to all state residents.

Safety issues for state airports are assessed in this report by their compliance with airspace requirements and Runway Safety Areas (RSAs). Based on MASP data, 78% of runway approach zones for Level I airports are obstruction-free. This percentage decreases for smaller GA facilities – approximately 30 to 35% of all state airport approaches require attention to mitigate obstructions. This is now less than the reported 42% in the 2008 Report Card. Compliance with mandated runway safety areas has also improved over the past four years with all commercial airports within the state now reporting FAA compliant RSAs.

[7] Based on measurements of roughness, surface distress, skid resistance and deflection, pavements can be assigned a score that reflects their overall condition. This score, sometimes called a pavement condition index (PCI), quantifies a pavement's overall performance and can be used to help manage pavement networks.

Investment Needs

To discuss future investment needs for Maine system airports, it is important to understand the interrelationship of respective funding sources including federal (primarily FAA), state (MaineDOT), local (the sponsoring municipality), and occasionally private investments.

Currently, Maine airports listed in the NPIAS are eligible to receive funding from three basic sources, including federal, state and local sources, for eligible projects.[8] Federal funding is provided by the FAA, with oversight of approved Congressional limits set-forth in the Airport Improvement Program (AIP). The AIP allows expenditures from the Aviation Trust Fund. In February of this year a new four year AIP Reauthorization was passed after the previous 23 continuing resolutions. Although a new bill is now in place, the allowable per/year expenditures have been reduced from $3.5 to $3.35 billion and the previous 95% federal share has now been set at 90% for most eligible airports. As discussed below, this increase in state and local share will have a significant impact on funding potential for future project implementation within the Maine aviation system, especially for the smaller general aviation airports. As noted in Table 1, Maine is ranked at the bottom of other New England states in terms of AIP expenditures per airport since 2007.

Table 1 FAA AIP Funding for New England States

FAA AIP FUNDING ($mil.)						Total AIP 2007 - 2011	NPIAS AIRPORTS	$ / AIRPORT (MIL)
State	2007	2008	2009	2010	2011			
Connecticut	17.5	31.5	27.0	23.2	16.2	115.4	14	8.2
Massachusetts	37.2	74.7	72.9	59.4	81.0	325.2	28	11.6
Maine	25.2	21.7	40.6	26.7	30.4	144.6	35	4.1
New Hampshire	36.5	18.8	14.1	13.4	30.1	112.9	15	7.5
Rhode Island	17.4	9.9	14.2	12.1	5.9	59.5	6	9.9
Vermont	3.1	8.4	20.7	22.8	9.0	64.0	13	4.9

For most eligible airport projects funded through the AIP (previously ADAP and FAAP), MaineDOT has historically funded either 2.5% or 5% of project costs depending on the status of current federal participation. This has always resulted in a 50/50 split between the state and sponsoring municipality. State funding has historically been available for all publicly owned airports in Maine. Due to severe budget cutbacks, Maine was initially only able to provide a 2.5% match for the new reauthorization which would have required municipalities to provide a 7.5% match. However, MaineDOT has very recently agreed to hold the state's share to 5% for FY 2012-2013. The funds allocated from MaineDOT will come from the recently enacted Multimodal Transportation Fund Accounts. There is a separate Multimodal Aviation Account along with a more generic Multimodal Transportation Account that can be utilized. At the present time, the most recent transportation bond for aviation is not able to be sold and utilized until

[8] Most eligible projects are for an airport's publicly used infrastructure, including runways, taxiways, aprons, airspace maintenance, navigational aid and related land acquisition, etc. If all safety related issues are completed by an airport, hangars are now also eligible.

2014 at the earliest, if at all. However, MaineDOT as mentioned above is still going to provide its 5% share of funding through other means by the existing funds in the Multimodal Aviation and Multimodal Transportation Fund Accounts.

In consideration of the above, and under current AIP funding requirements, the local airport sponsor is now responsible for the remaining 5% for eligible projects. Since most airports in the state do not operate with a surplus, local funding needs are paid by the town's annual budget and/or through private support. A typical runway project can cost $3 million to $5 million, including planning, design, permitting, mitigation and construction. Small towns' budgets may now witness a funding requirement in excess of $250,000 for this type of project. Since most small communities are experiencing severe budget constraints, it is reasonable to assume that some AIP grant offers may not be matched with current municipal capabilities, and much needed infrastructure/safety improvement and enhancement projects could be delayed.

Tax revenue from airport activities, fuel tax, use tax on the sale of aircraft, and the airport vehicle rental car tax is deposited into the Multimodal Transportation Fund.[9] These revenues are in turn reallocated to non-automotive transportation activities throughout the State of Maine.

The 2008 Report stated that between 2008 and 2025, the total cost to fund the Maine airport system's capital programs could reach an estimated $579 million, according to MASP.[10] If averaged out over the 20-year planning period, approximately $29 million will be required on an annual basis. This is exactly the average annual AIP expenditure within the Maine system over the past five years. Nonetheless, maintaining this level AIP spending in the short-term appears in jeopardy due to state and local funding capabilities.

Examining Maine's recent funding history indicates that when all federal, state and local sources are considered, annual investments in Maine's commercial and public general aviation airports have been met. The single most important component of long-term funding is the health and viability of the AIP. With recent airline bankruptcies, increasing fuel costs and anticipated economic challenges, it is reasonable to assume there will be additional reductions in AIP funding. This is witnessed by the current annual AIP expenditures capped at $3.35 billion compared to the previous allowable $3.5 billion. In the 2008 Report Card it was reported that based on current funding, a minimum $100 million shortfall is possible through 2025 for all airport capital development needs. If MASP's assumptions regarding funding cuts in AIP come to fruition, this shortfall could easily more than double over the next 20 years. This shortfall also may be exacerbated by state and local limitations as well.

Another important consideration in the implementation of most airport infrastructure upgrade/improvement projects is the current environmental approval and permitting process. Costly and time intensive mandates often delay the commencement of proposed projects at the expense of infrastructure adequacy and operational safety. Streamlining current environmental policies and procedures would benefit airport improvements at all levels.

[9] Money disbursed from the Multimodal Transportation Fund may be used for the purpose of purchasing, operating, maintaining, improving, repairing, construction and managing the assets of the Multimodal Transportation Fund including buildings, structures, improvements and equipment.

[10] These costs are presented in a "top-down" approach within the MASP, in other words, specific airport development projects are not necessarily reflected therein. Although known larger capital projects such as the proposed terminal improvements at the Portland Jetport and a possible replacement airport for Machias are not specifically identified, it is likely that the overall average for each airport's benchmark is an accurate reflection of the system's capital needs.

Conclusions and Recommendations

Overall, the condition of Maine's airport system is good. The challenge in the future will be maintaining the relative health of the airport system given the constraints to local, state and federal funding. The FAA and MaineDOT staffs have worked successfully with various local sponsors in prioritizing various projects based on safety needs first, followed by capacity enhancements. Maine's airport infrastructure is in good condition and has improved modestly from our 2008 Report Card therefore resulting in a grade of B.

If the Maine airport system is to maintain existing infrastructure, achieve overall compliance with FAA mandates and design guidelines, and provide improvements to address economic and capacity enhancement needs, Maine ASCE makes the following recommendations:

- Work with the U.S. congressional delegation to amend the current reauthorization to reestablish federal funding at 95%[11]. This will greatly alleviate pressure on the state and local governments to generate respective grant matches.
- Work with Maine legislature to ensure future state AIP matches can be met beyond FY 2013.
- Utilize the Multimodal Transportation Fund Account derived from aviation revenues to fund much needed airport maintenance projects at General Aviation Airports throughout the State of Maine.

Sources:

Interviews and collaboration with aviation experts in Maine including:
Jeffrey Northgraves, Knox County Regional Airport; John Guimond, Augusta State Airport; Tim LeSiege, Maine DOT; Bill Gerrish, Stantec Consulting Services; and Paul Bradbury, Portland International Jetport; Steven Buck, City of Caribou

1. http://mainegov-images.informe.org/mdot/aviation/pdf/maspu.pdf (Maine Aviation System Plan)
2. http://mainegov-images.informe.org/mdot/aviation/pdf/economicimpacts.pdf (Economic Impact of Aviation in Maine)
3. http://faa.gov/airports_airtraffic/airports/planning_capacity/npias/ (National Plan of Integrated Airport Systems)
4. http://www. Maine.gov/mdot/aviation/aviation-home.php (Maine Department of Transportation – Airports and Aviation)
5. http://www.nasao.org/ (National Association of State Aviation Officials)

11 The US Senate is currently considering such an amendment that has passed committee endorsement.

BRIDGES

Grade: C-

Overview

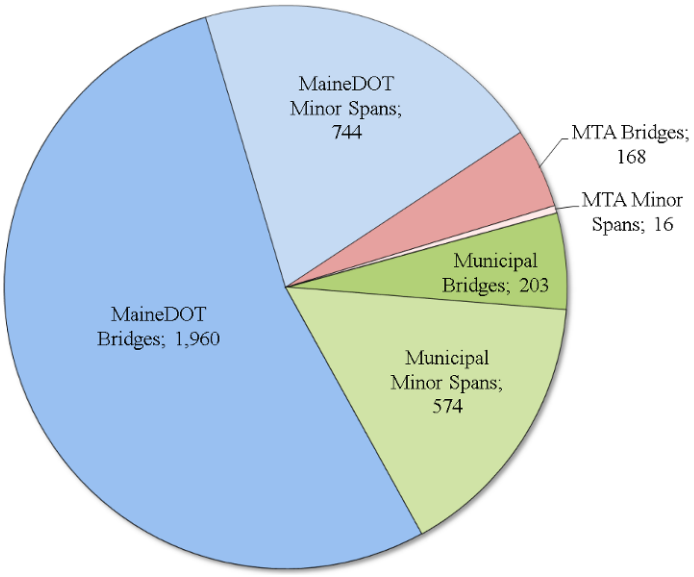
28% of Maine's bridges are deficient which is slightly worse than the national average of 24%. Recent bridge funding initiatives facilitated a 6% reduction in the number of deficient Maine bridges since 2008. However, the expiration of those initiatives coupled with reduced funding threatens to erode this progress. Continuing to improve the condition of Maine bridges to meet recently adopted performance goals will require increasing MaineDOT bridge funding to $106 million annually.

Background

The highway system is the most important transportation service for Maine's 1.3 million residents and visitors, providing access to homes, employment, shopping, agricultural land and recreation. Improved roads and bridges 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.

Maine's highway system includes a total of 3,665 bridges owned by MaineDOT, municipalities and the Maine Turnpike Authority (MTA). As shown in Figure 1, this inventory includes 2,331 bridges and 1,334 minor spans. In this report the term "bridges" refers to structures that are greater than 20 feet in length. Minor spans have span lengths measuring 10 to 20 feet in length.

Figure 1: Maine Bridges and Minor Spans by Owner

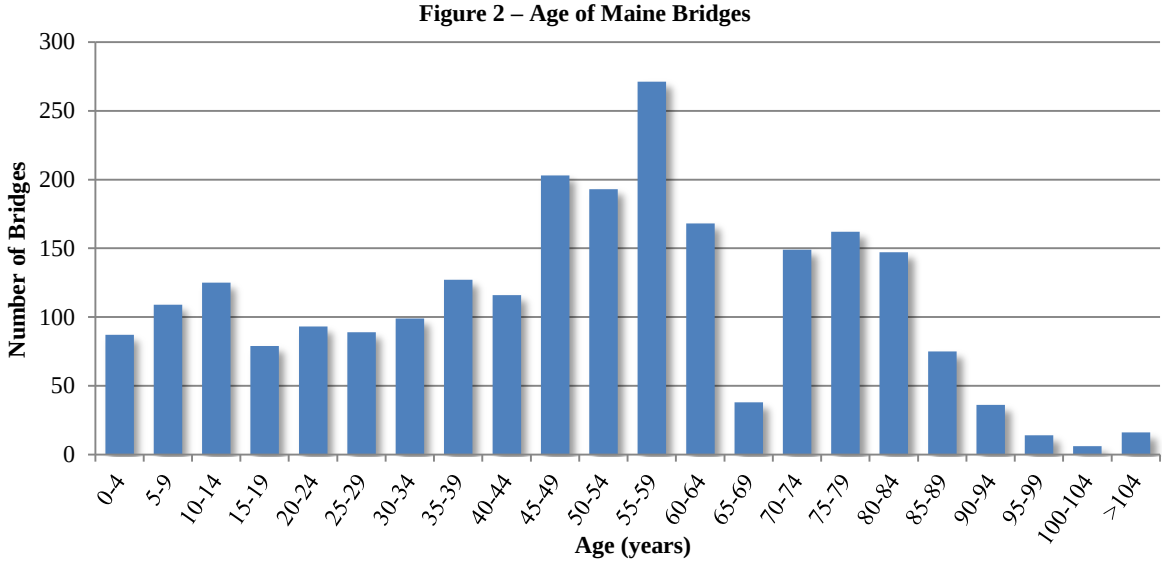


According to MaineDOT data, 53% of Maine's bridges were constructed more than 50 years ago which is a 4% increase from 2008. In addition, nearly 12% of Maine's bridges are at least 80 years old. Many of these bridges were designed to last only 50 years before requiring significant repair or replacement. Historic bridge funding levels have not allowed Maine bridges to be replaced before reaching their design life. A chart summarizing the age of Maine's bridges is included as Figure 2.

In terms of route importance, Maine's bridge inventory includes 467 bridges carrying the National Highway System (NHS). The NHS includes the Interstate Highway System, as well as other roads vital to the nation's economy, defense and mobility. While reviewing the condition and ratings of bridges, Maine's NHS bridges will be evaluated separately since they are an important part of the state and national transportation system.

Bridges associated with Maine's interstate system, structures that carry vehicles on or over the interstate, represent more than 20% of the state's bridge inventory. With an average age of over 44 years old many of these bridges are showing signs of significant deterioration and will require major repairs and rehabilitation in the near future. This need will place an additional burden on Maine's already strained funding sources.

Figure 2 – Age of Maine Bridges



Inspection Frequency and Methods

All Maine bridges are regularly inspected in accordance with the Federal Highway Administration's (FHWA) National Bridge Inspection Standards (NBIS). MaineDOT inspects most state and municipal bridges every two years. Turnpike bridges are inspected annually. This inspection data, together with information from MaineDOT and the Maine Turnpike Authority (MTA), was used as the basis for evaluating the condition of Maine bridges.

NBIS Rating System

The NBIS established by FHWA and the American Association of State Highway and Transportation Officials (AASHTO), defines the scope of bridge inspections and provides guidelines for rating and documenting the condition and general attributes of bridges. Standard condition evaluations are documented and functional aspects of the bridge are rated. NBIS provides criteria to define a bridge as either structurally deficient or functionally obsolete.

Structurally Deficient (SD): A bridge is structurally deficient if there is significant deterioration to the bridge deck, bridge supports or other major components. Although bridges classified as structurally deficient are safe for continued use, they may be posted for lower weight limits or closed if their conditions warrant such action. In a worst case scenario, a structurally deficient bridge may be closed to traffic.

Functionally Obsolete (FO): A bridge that is functionally obsolete is safe to carry traffic but has narrow lanes, inadequate clearances or poor alignments which do not meet current standards. Bridges that qualify as both structurally deficient and functionally obsolete are categorized only as structurally deficient because this is a more significant quality indicator.

Condition and Adequacy

The breakdown of Maine bridges listed as either structurally deficient or functionally obsolete in 2012 is shown in Table 1. In addition to statewide averages, percentages of structurally deficient and functionally obsolete bridges are listed by owner and span length.

Nearly one in three Maine bridges and minor spans are either structurally deficient or functionally obsolete. These bridges show significant deterioration to their decks and other major components or have inadequate lane widths, shoulder widths or vertical clearances to serve current traffic demands. According to The Road Information Program (TRIP), a non-profit transportation research organization, "Bridge deficiencies have an impact on mobility and safety. Restrictions on vehicle weight may cause many vehicles – especially emergency vehicles, commercial trucks,

school busses, and farm equipment – to use alternate routes to avoid these bridges. Narrow bridge lanes, inadequate clearances and poorly aligned bridge approaches reduce traffic safety".[4]

Table 1 – Condition of Maine Bridges in 2012

Bridges *(spans ≥20' in length)*

Owner	# Bridges	Structurally Deficient		Functionally Obsolete		Total Deficient		Change from 2008
MaineDOT	1,960	245	13%	294	15%	539	28%	-3%
Municipal	203	51	25%	10	5%	61	30%	-25%
MTA	168	11	7%	50	30%	61	36%	-14%
Total	2,331	307	**13%**	354	**15%**	661	**28%**	-6%

Minor Spans *(spans 10' to <20' in length)*

Owner	# Bridges	Structurally Deficient		Functionally Obsolete		Total Deficient		Change from 2008†
MaineDOT	744	75	10%	71	10%	146	20%	-1%
Municipal	574	135	24%	41	7%	176	31%	-2%
MTA	16	0	-	0	-	0	-	-
Total	1334	210	**16%**	112	**8%**	322	**24%**	-2%

Bridges & Minor Spans

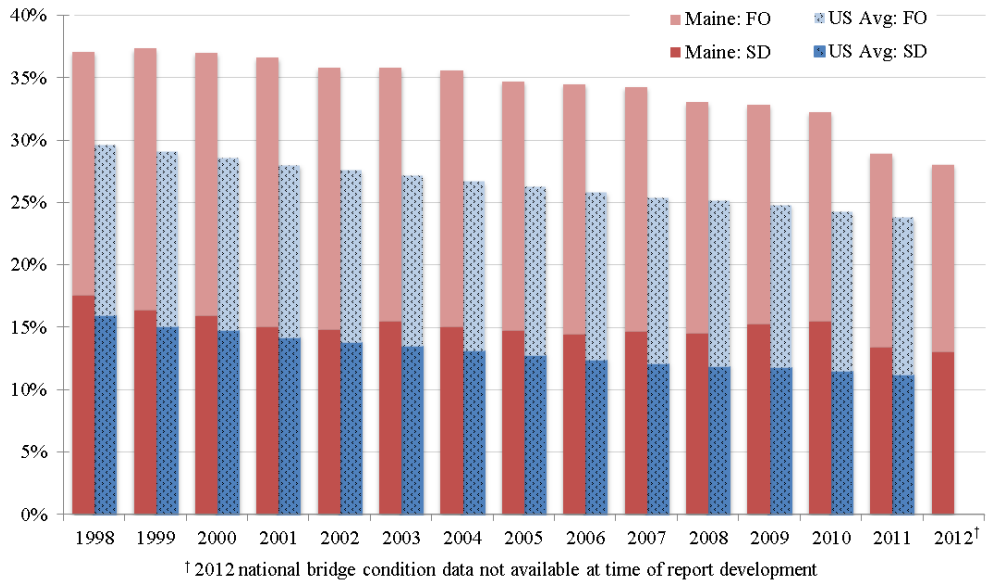
Owner	# Bridges	Structurally Deficient		Functionally Obsolete		Total Deficient		Change from 2008
MaineDOT	2704	320	12%	365	13%	685	25%	-2%
Municipal	777	186	24%	51	7%	237	31%	-8%
MTA	184	11	6%	50	27%	61	33%	-17%
Total	3665	517	**14%**	466	**13%**	983	**27%**	-4%

†Number of FO minor spans in 2008 not available. This report assumes no change in percentage of FO bridges between 2008 and 2012.

Figure 2 compares trends in the condition of Maine bridges to the national average. Maine has historically had larger percentages of structurally deficient and functionally obsolete bridges when compared to the national average.

When Maine's National Highway System (NHS) bridges are considered separately the percentage of deficient bridges drops from 28% to 24%. Seven percent of Maine's NHS bridges are structurally deficient while 17% are functionally obsolete. This smaller percentage of deficient bridges on Maine's NHS roadways indicate these vital structures are generally in better condition than the average Maine bridge. Figure 3 compares the condition of Maine's NHS bridges to the national average in 2012.

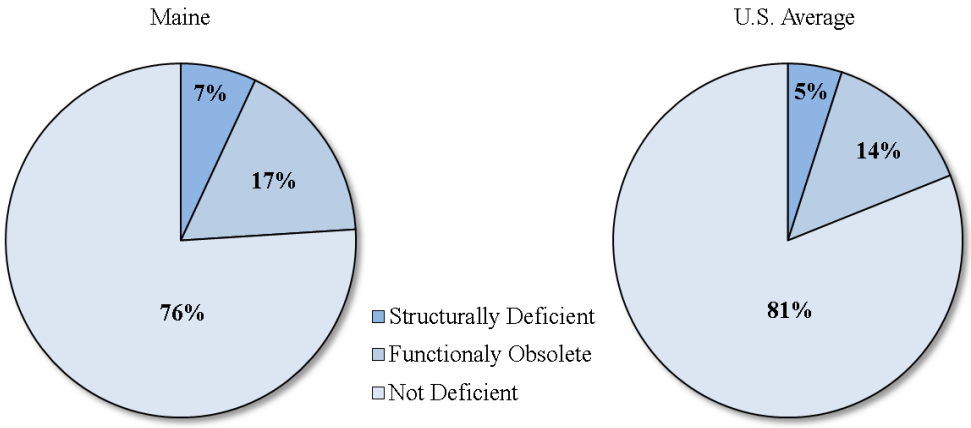
Figure 2 – Historical Comparison of Deficient Maine Bridges to the National Average



† 2012 national bridge condition data not available at time of report development

Maine's minor spans are also in need of improvement. Approximately 16% of these structures are classified as structurally deficient and an additional 8% are classified as functionally obsolete.

Figure 3 – Comparing the Condition of Maine NHS Bridges to the National Average



Investment Needs

In the July 2010 report "Connecting Maine," MaineDOT estimated that the necessary investment need for bridges over the next 10 years was between $1.6 billion and $1.8 billion, or $160 to $180 million per year.

In the spring of 2012, the state legislature passed LD 1753B which required MaineDOT to prioritize and set performance goals for Maine's transportation corridors. This new system represents a more sophisticated approach to managing Maine's roadway and bridge infrastructure by setting Customer Service Levels (CSL) for all bridges. These new CSL goals vary the acceptable condition and load capacity of bridges based on the relative importance of the roadway corridor they carry. With these new performance goals in mind MaineDOT reports the projected bridge funding gap has been reduced, but that the need is still approximately $106 million per year over the next 10 years.

Historically, funding for Maine's bridges has been $70 million per year. In 2008, the Maine Legislature approved an additional $160 million over four years, increasing the state's annual bridge investment to $110 million for the 2008 through 2012 period. This funding increase contributed to a 3% reduction in the number of deficient MaineDOT bridges over the past four years.

Traditionally Maine has utilized bonds to fund a significant portion of its transportation budget. In November 2012 Maine voters overwhelmingly approved a $51.5 million bond referendum for transportation. However, the current outlook is that the use of voter-approved bonds in 2013 is unlikely.[5] Maine ASCE is concerned that without replacement funds from other sources the likelihood of meeting the goals set out in LD 1753, and the infrastructure investments and benefits associated with this proposed borrowing, will be further delayed.

However, with federal funding levels remaining flat, Maine's recent bridge funding initiative set to expire, and the lack of upcoming transportation bond funding, the investment in Maine bridges is expected to drop to $60 million annually – well below all recent projections of funding need. Unless action is taken to secure additional financing, the overall condition of Maine's bridges will worsen.

In addition, a bi-state bridge funding task force was created in 2010 by the Governors of Maine and New Hampshire to determine the needs of the three river crossings connecting Kittery, Maine with Portsmouth, New Hampshire. The task force was also charged with developing potential solutions to fund these significant structures. Based on assumptions outlined in the resulting report, the task force identified a $125 million gap in future funding over next 30 years for the capital and maintenance needs for those three bridges alone.[6]

Similar to MaineDOT, the MTA has recently focused a significant portion of its capital improvement program on bridge rehabilitation and replacement. This initiative facilitated a 17% reduction in the number of deficient MTA bridges over the past four years. In spite of this recent progress, 33% of MTA bridges remain deficient. Funding for MTA's 5-year (2012-2016) capital improvement program, which includes $113 million for bridge replacement, rehabilitation and repair, is critical to maintaining the Turnpike's infrastructure. A toll increase was recently enacted by the MTA to fully fund this program.

Conclusions and Recommendations

While the overall number of deficient bridges in Maine continues to be on the decline, bridge conditions remain below desirable standards and the national average. The state should focus on meeting the newly-established CSL goals within the next decade. Doing so will require cooperation between federal, state and local governments to increase the annual investment in MaineDOT bridges to $106 million for the next ten years.

Although Maine has a higher percentage of deficient bridges than the national average, recent state and federal funding initiatives facilitated a 6% reduction in the number of deficient Maine bridges over the past four year period. As a result, Maine's bridge inventory is assigned a letter grade of **C-**. However, funding for our bridges is expected to fall well below projected need beginning in 2013. Unless MaineDOT's bridge maintenance and capital improvement program is fully funded the recent gains in bridge condition will be short-lived.

Successfully and efficiently improving Maine's bridge infrastructure will require a long-term, comprehensive strategy, including identifying potential financing methods and investment requirements. Reliance on the gas tax has become insufficient because adjustments have not kept pace with inflation. Insufficient funding will ultimately shorten the service life of our bridges and result in higher life-cycle costs. Increasing investment levels now will significantly reduce future funding needs.

For the continued safety of our bridges, Maine ASCE recommends:

- Maximize existing funding sources, such as state's general fund, bonds, impact fees, tolls and car registration fees, and expand to new sources including the General Fund. Without adequate indexing, continued reliance on the gas tax for a majority of MaineDOT funding will not suffice;

- Fully fund MaineDOT's bridge maintenance and capital improvement programs in order to meet the recently-established Customer Service Level goals;

- Establish a state funding mechanism for municipal bridges and encourage municipalities to establish capital reserve funds for the repair of important municipally-owned bridges. MaineDOT should help municipal bridge owners understand and plan for the investment needs of these structures; and

- The Maine-New Hampshire interstate bridge authority, originally formed to oversee the care and control of the Sarah Mildred Long Bridge, has been dormant for a number of years. The Authority should be revitalized and expanded to include the Sarah Mildred Long Bridge, Memorial Bridge, and I-95 high level bridge. The authority should also establish appropriate funding mechanisms for each of the three bridges.

Sources

Information for this report was obtained from a number of sources including the MaineDOT, Federal Highway Administration (FHWA), the Maine Turnpike Authority, the Maine Better Transportation Association, and TRIP.

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4. "Falling Behind: The Condition and Funding of Maine's Roads, Highways & Bridges", October 2009, TRIP
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6. "Final Report Bi-State Bridge Funding Task Force", December 15, 2010, http://www.maine.gov/mdot/docs/bistatebridgefinalreport1.pdf

PASSENGER TRANSPORTATION

Grade: C-

Overview

Maine's transit ridership grew 22% from 2006 to 2010. However, only 46% of transit vehicles are in good condition. Passenger rail continues to expand, yet long-term sustainable funding remains unidentified. Ferry services provide primary transportation to island communities and have seen marked improvements with facilities and vessels, but the state needs to identify viable funding for vessel replacements to maintain service levels.

Background

Passenger transportation includes traditional mass transit, as well as passenger rail, car-pool and van-pool programs, and bicycle and pedestrian-focused projects. The Maine State Ferry Service is also included, due to its importance to the overall Maine transportation system. However, the four private intercity bus services, currently one of the primary modes of connectivity within this rural state as well as nationally and internationally, and a vital part of Maine's transportation system, are not included as they receive limited or no public funding.

Transit, for the purposes of this report, is limited to the 21 rural and small urban transportation systems that are divided into eight geographical regions and are supported by the Maine Department of Transportation (MaineDOT) through funds mostly provided by the Federal Transit Administration (FTA). These services rely on other transportation infrastructure (roads, bridges, ports and railroads) and funding sources (Maine Department of Health & Human Services, local, etc.) to operate efficiently and effectively.

The Governor's Interagency Transportation Coordinating Committee was created in 2009 to bring the various funding components together to maximize service to the public. The Departments of Transportation, Health and Human Services and Labor all serve on the committee, and are charged with strengthening the collaborative efforts in delivering transportation services across various state agencies and programs by promoting efficiency, cooperation and strategic planning for public transportation purposes. A similar initiative was also developed on the national level in 2004 with, "United We Ride."

Maine's 21 transit systems fall into one of three categories:

- **Regional transportation systems.** There are nine regional transit systems receiving MaineDOT funding support (and one that is not funded) that serve rural areas of the state known as Regional Transportation Providers. In general, the systems serve low income, elderly, the disabled, and clientele of the Department of Health and Human Services (DHHS) and other agencies.
- **Fixed route transit systems.** There are 13 systems that offer year-round fixed route service. They operate according to a fixed schedule and a fare system and are broken down further into urban and rural systems, inter-city systems and ferry systems. These can vary from providing service to just one community, to connecting several adjacent communities, to a county or regional wide connection of communities. There are also several private ferry services that are currently seeking or have been provided some limited assistance from both state and federal funding sources to better serve the island communities and connect/coordinate with mainland transportation systems.
- **Transit systems supporting the tourist industry.** Five of the providers above also offer specific routes, both year round and seasonally, that help support tourism related industries and are designated as "Explorer" services. They are the Island, Mountain, Sugarloaf, Shoreline, Brunswick and Kennebec. Brunswick and Kennebec offer year-round service while the others support a more seasonal operation.

Passenger rail service includes Amtrak's Downeaster from Portland to Boston which is operated by Amtrak under a 20-year agreement with the Northern New England Passenger Rail Authority (NNEPRA). The 116-mile corridor is owned by Pan Am Railways and the Massachusetts Bay Transportation Authority. A 29 mile expansion of that service to Brunswick with a stop in Freeport is scheduled to begin service on November 1, 2012.

Other transportation systems include GO MAINE Commuter Connections rideshare program operated by the Greater Portland Council of Governments and administered by the MaineDOT and the Maine Turnpike Authority (MTA); 54 Park & Ride lots with over 2,440 parking spaces, funded and maintained by MaineDOT (42 lots, 1,644 spaces) and MTA (12 lots, 797 spaces); and the Maine State Ferry Service (MSFS), which is the primary mode for access to the mainland from six of Maine's year-round island communities.

To increase both bicycle and pedestrian mobility, MaineDOT instituted a program to construct paved shoulders, bike lanes, and/or sidewalks. However, the impact of the roadway priority system may have an adverse impact in some areas, as fewer roads see total re-construction or a level of funding that will allow for paved shoulders or the addition of bike lanes. Over the last four years, the Down East Sunrise trail (part of the East Coast Greenway) has been completed and opened for use and several segments have been completed on the Eastern (also part of the East Coast Greenway) and Mountain Division trails.

Condition and Adequacy

Ridership

In 2006, total ridership on transit systems serving Maine was 6.3 million passenger trips and had increased to more than 7.2 million in 2008 and increased to over 7.7 million in 2010. This amounts to more than a 22% increase in ridership in just a 4 year period, with half of the increase occurring in 2008. According to an American Public Transportation Association (APTA) report released in 2012, public transportation ridership surged in the first quarter of 2012. This was the fifth consecutive quarter of U.S. public transit ridership increase covering all types of public transit service. Similar increases have occurred in Maine. In a June 2012, Greater Portland Transit District (METRO) ridership was up 3.5% through May 2012. METRO's Falmouth Flyer ridership increased between 7 and 11% every month this year through May, except March. South Portland Bus Service (SPBS) has also had a record year in 2012, where ridership was 18% higher through May 2012 than in the first 11 months of 2011. As gas prices rise, often people switch to public transportation to save money, but new trends are also a result of more dependable service and use of real time technology, making it easy for riders to know when the next bus or train will arrive. As fuel prices continue to remain high and service reliability increases, ridership on transit systems across the state should continue to experience steady growth.

Transit Vehicle/Ferry Vessel

According to annual report of the Governor's Interagency Transportation Coordinating Committee, MaineDOT is responsible for 453 of the transit vehicles in Maine and only 46% of them (208 vehicles) have more than 50% of their useful life remaining (good condition). The remaining 54% (245 vehicles) have 50% or less of their remaining life and of those, 74 vehicles (16.5% of total) have reached the end of their useful life and another 25 (5.5% of total) are beyond 90% of their useful life. This puts 208 vehicles in good condition, 146 in fair condition and 99 in poor condition. MaineDOT replaced 65 vehicles during 2011, or this picture would have been far worse.

Of the five active vessels used by the Casco Bay Island Transit District to provide over 962,000 passenger trips per year, the oldest is 39 years old, and the average age of the fleet is 23 years old. They have only one vessel with less than 18 years of service which would place it in good condition, while the remaining vessels would fall into a fair or poor condition category. The Maine State Ferry Service provides service to a half a million passengers and more than 175,000 vehicles per year with seven ferries. With their newest vessel coming on line in 2012 and their oldest going up for sale this year, the age range for the updated fleet is from 1 year to 52 years old. Even with a new vessel, the average age of the fleet is 26 years old and the two spare vessels used to replace an active vessel when it breaks down or goes in for annual maintenance/inspections are both over 44 years old. This places one vessel in excellent condition and the remaining in fair or poor condition.

Amtrak Downeaster

The Downeaster's ridership continues to grow. After large increases in calendar 2007 and 2008, the service suffered a small setback in 2009, but since then has grown approximately 6% a year. Based on volume through July 2012 and compared to previous years, the service is on pace to carry more than 540,000 passengers in 2012. Expansion of the service to Brunswick with a stop in Freeport is scheduled to start on November 1, 2012. With this expansion, ridership is projected to increase by 36,000 riders and the seasonal passenger service on the Rockland Branch may also experience increased patronage. Amtrak's Downeaster cars and locomotives range in age from 14 years to more than 39 years old and it operates with two train sets with typical seating capacity of 298 for the one-way, 2 hour and 25 minute trip from Portland to Boston. The Portland layover facility is inadequate to service the trains efficiently and cost effectively, so all heavy maintenance is performed in Boston. The Downeaster struggled in FY2011 to provide reliable service with the On Time Performance (OTP) at only 79% but saw an improvement of OTP to 85% in FY2012. Over half of the delay time was attributed to infrastructure and speed restriction issues mainly associated with the Massachusetts Bay Transit Authority (MBTA) portion of the line and the remaining is associated with line capacity and interference issues, weather and occasional equipment failure. Even with these, the Downeaster continues to get the highest customer service ratings in the Amtrak system.

Bicycle/Pedestrian

Due to the increased focus in recent years, including increased investments in bike lanes and paved shoulder, current laws and various programs, Maine has maintained a high rating by the League of American Bicyclists. Ranked 6th in the nation for being bicycle friendly in 2008, Maine reached a high rating of 2nd in 2011 and currently is 9th for 2012. Changes in rank can be attributed to several factors such as more states becoming more bicycle friendly with changes to programs and the adoption of national policies as well as changes to the evaluation criteria as more people become educated and aware of the benefits these facilities bring to a transportation system.

Investment Needs

Financial support from the FTA to MaineDOT is distributed to 21 rural and small urban transportation systems. FTA typically allocates these funds by formula and identifies annual funding levels for five years. The majority of these funds are used for operating support. Federal and state funds can cover 90% of the capital costs or 95 percent if that agency is using clean fuel vehicles like Compressed Natural Gas (CNG) or bio-fuels. These funds can support up to 90 percent of the administrative costs and up to 60 percent of an operating deficit. In the 2007/2008 budget, transit operators reported an average $47.9 million in expenses and $50.6 million in revenues. By 2009/2010 budget, expenses had climbed to $69.9 million while revenues were only $67 M. Expenses for DHHS provided services jumped by 56% between the two budget cycles and transit oriented expenses increased by 33%. DHHS provided service revenues which were not meeting the expenses in 2007/2008, only increased by 54%, creating an even larger deficit and transit revenues only increased by 10%, eliminating any surpluses from the 2008/2009 budget. Overall, the surpluses experienced in 2007/2008 were expended to cover the additional expenses of 2009/2010, balancing the account. What this did not address was the large gap between expenses and revenues and how that might be handled in 2011/2012 as well as future biennium's. Over the last several years, FTA funding has remained flat with the use of continuing resolutions and social services funding has been capped, but the recent passage of the two year transportation bill referred to as MAP 21 will bring a significant increase to Maine's FTA allocation and some flexibility on how it is disbursed. This should help with the deficits, but transit operators may still need to find additional revenues or make cuts in service while trying to maintain the existing and growing ridership associated with our economic times and aging population.

Maine's 21 transit systems operate 453 vehicles, ranging in size from minivans to full size transit buses. With 54 percent of these vehicles in poor to fair condition, the state is falling behind on the needed replacement schedule. The 2012-2013 biennial budget has $2 million allocated for vehicle replacement and there is an additional $4.6 million requested from the State of Good Repair Program to supplement this. These amounts are 45% below the estimated $11.7 million needed to replace vehicles as they reach the end of their useful life during this same time period. This requires more extensive maintenance efforts to keep the same number of seats on the road needed for growing ridership. There is $2 million for transit allocated from the transportation bonds that were overwhelmingly approved on the November 2012 ballot which could leverage $9 million in federal matching funds. Current indications are that these bonds will not be available in 2013 further delaying any improvements.[i]

Casco Bay Island Transit District (CBITD) did receive Ferry Boat Discretionary funding for their new vessel, the *Wabanaki*, and it is currently under construction and should be delivered early in 2013. Funding was also identified to improve fendering systems and accessibility issues at three of the islands served by CBITD, and those improvements are underway and scheduled to be completed in the fall of 2012. The Maine State Ferry Service also had success in obtaining a qualified bidder for the construction of a vessel to replace the *Governor Curtis*. The *Captain E. Frank Thompson* was delivered in the spring of 2012 and is now providing full time service to the Island of Vinalhaven. MaineDOT also received funding to upgrade the piers or fendering systems at several locations and they should be completed by the end of calendar year 2012. Even with these successes, the average age of the MSFS fleet is 26 years. MaineDOT has started the process to design a replacement vessel for the Lincolnville to Islesboro run. Both the MSFS and CBITD should continue to evaluate and pursue funding for the planning, design and then construction of replacement vessels to ensure that reliable service is maintained to all the island communities served by them. Maintenance of an aging fleet will remain high and funding subsidies will remain necessary for the operating and maintenance budgets. High fuel costs will continue to have a detrimental effect on the level of service.

The Downeaster line's 2012 operating budget was $15.8 M. Of the total budget, $8.4 million came from fares, $1.5 million from MaineDOT and the remaining $5.9 million was provided by Congestion Mitigation and Air Quality (CMAQ) federal funding. CMAQ funding has continued to be a source of funding with the use of continuing resolutions and now with the recent passage of the two year bill MAP 21, CMAQ funds will remain available for the short term. The long term future use still remains somewhat uncertain, where typically this funding source is only available for new projects and not to sustain operations indefinitely. The State did follow the recommendations of the Task Force on Passenger Rail Funding by providing a portion of the tax revenues from car rentals towards sustaining the operation of the Downeaster. New Hampshire and Massachusetts do not contribute operating funding, even though more than 38% of the ridership is from those two states. NNEPRA did receive $35 million in High Speed Intercity Passenger Rail (HSIPR) funding to expand the service to Brunswick and those improvements should be completed by the fall of 2012. They also received $20.8 million from FRA in HSIPR funding to be matched with $5.2 million from MBTA to make improvements along the corridor in Massachusetts that should improve the on time performance and lead the way for increased service. With the extension of the service, the layover plans have been re-focused to construct a facility in Brunswick and NNEPRA is currently waiting on the announcements of TIGER IV (National Investments Discretionary Grants) to see if the additional funds necessary to construct that facility will be available.

MaineDOT had expanded the Go Maine budget to $400,000 per year but is now reducing it back to the $200,000 level and re-structuring the system to return to its core purpose of coordinating carpool match-ups and promoting commuter services with education, outreach and programs like emergency ride home. The van pool service that had been run by the state through Go Maine will be privatized so that it may expand in demand areas and let more of the Go Maine funding be used for education and outreach. Maine DOT has $120,000 for capital and $80,000 for maintenance in 12/13 biennial budget for Park & Ride lot improvements. MTA will continue to maintain the Park & Ride lots that it owns, and is replacing the two Park & Ride lots at Exit 80 in Lewiston with a new 96 space lot off Rt. 196 at a cost of $800,000 in 2012 to accommodate the interchange reconstruction project. No other MTA Park & Ride lot improvement projects are currently planned.

The current work plan has $6 million allocated for the next two years for a variety of bicycle and pedestrian enhancements projects (TE) and the Safe Routes to School Program (SRSP) has a budget of $2 million over the next 2 years. Currently, 92 communities are requesting funding for more than $45 million worth of project work. FTA is also providing funding in the New Freedom program to help make improvements at transit stops to aid those with mobility challenges. While all of this helps improve the system and the quality of life of those using the system, the needs are far greater than the available funding and funding levels remain stagnant or have decreased even with rising construction costs.

Conclusions and Recommendations

Most areas in Maine do not have the population density to support typical transit services, but many Maine citizens and visitors need transportation options to driving a car. Choices are made based on convenience, schedule, costs and the environment, and as Maine's population ages, these alternatives will become increasingly important. Regional Transportation Providers provide on-demand, door-to-door non-emergency medical transportation to

thousands of Maine residents in rural communities. In order to fulfill the needs of the communities, these services have been expanding beyond health care to include transportation to work and school. There is a concern that these agencies are already under resourced.

Fixed-route transit providers' limited funds restrict their ability to continue meeting growing demand. Rising operating costs burden local providers and jeopardize service to an expanding customer base. Finding a long term sustainable funding source to supplement the fare box remains a challenge for passenger rail. With minimal funding for ferries, there is greater potential for future decreases in service. Ferries are the only viable transportation mode to the islands communities and identifying long-term and cost-effective ways to maintain and replace them is vital.

According to the MaineDOT's *Connecting Maine* report, these modes of passenger transportation will be competing with funding shortfalls for the next 10 years and beyond, in the comprehensive transportation system. Each mode is an important part of the overall transportation system and with a slowing economy and increased energy costs; demand is growing in all geographic areas of the state. Maine faces some big challenges and must identify new and sustainable funding sources in order to meet those needs and provide residents with an adequate transportation system. Maine ASCE gives passenger transportation in Maine a Grade of C-.

Maine ASCE's recommendations for passenger transportation include:

- Promote and implement statewide land use strategies and demand management measures (e.g., discourage use of cars by increasing parking fees in urban areas). This could slow traffic growth in urbanized areas and promote transit use or car/van pooling;
- Provide additional financial support for Regional Transportation Providers;
- Based on funding complexities associated with public transit systems, the state should continue to work with and challenge federal, state and local entities to maximize the use of all funds without diminishing current levels of service or adding layers of administration.
- Consider additional state funding for fixed route transit providers where population densities merit, as well as for ferry services, though fare box revenues should be increased proportionately for both modes as well;
- Continue the implementation of the recommendations from the joint MaineDOT/MTA 2007 Park & Ride Lot Study;
- Continue to provide passenger rail with funding from state's general fund as recommended by the "2007 Task Force on Passenger Rail Funding," as well as expanding support to the Multimodal Account (formerly the State Transit Air Rail account); and
- Persuade NH and MA to provide equitable support of Amtrak's Downeaster service.

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[i] http://bangordailynews.com/2012/06/12/politics/lepage-refuses-to-sell-bonds-even-those-already-approved-by-voters-until-2014/

PORTS & WATERWAYS

Grade: C+

Overview

Maine's seaports are in good condition, and more than $30 million has been invested in capital improvements since 2008. Continued investments are still needed to remain competitive, safe, and secure, especially in areas of dredging and maintaining unhindered access to Searsport and Portland Harbor. Long-term investments are required to facilitate projected surges in containerized traffic. Maine should continue to promote enhancements to ports and harbors serving its viable cruise, commercial fishing, and recreation industries.

Background

Maine has 12 significant ports and harbors, which are well-suited to handle the requirements of modern cruise vessels. Five of these ports, Portland, Searsport, Bucksport, Bangor, and Eastport, are also considered suitable to handle the requirement of most modern cargo vessels.[i]

Figure 1: Ports and Harbors of Maine

List of Maine Seaports and Harbors

1. Kennebunkport
2. Portland
3. Freeport
4. Bath
5. Boothbay Harbor
6. Rockland
7. Camden
8. Belfast & Searsport
9. Bucksport
10. Bangor
11. Bar Harbor
12. Eastport

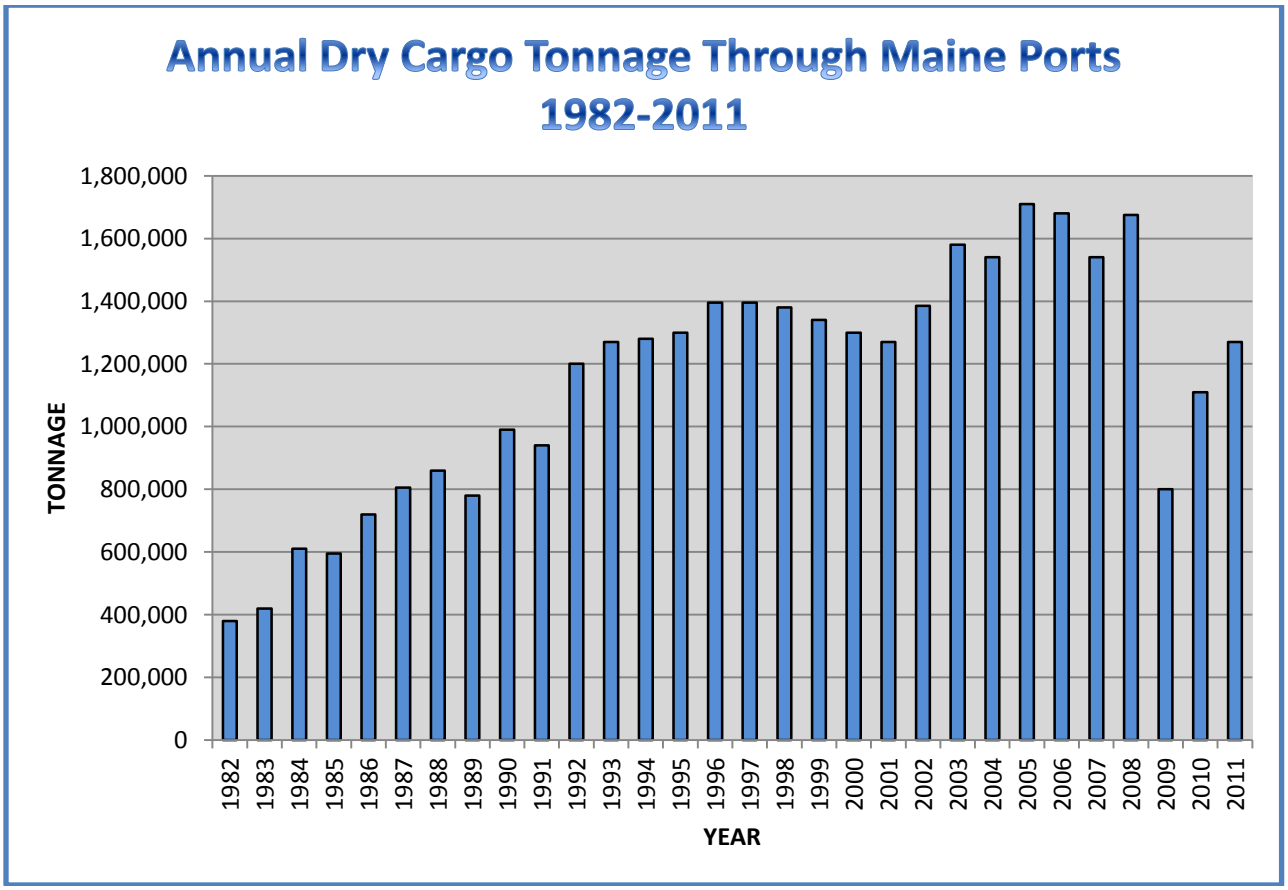
Industrial

Since 1970, industrial port development has been generally concentrated in three areas: Eastport/Quoddy Bay, Penobscot Bay and River (Searsport, Bangor and Bucksport), and Portland Harbor. This follows a three port strategy policy adopted in the early 1980s to maximize the effectiveness of the limited funds available for port development. Each area offers deep water, quality pilotage and services necessary for ocean-going vessels. Utilization of industrial ports in Maine varies depending on the terminals, time of year, and market conditions. In 1980, only a limited amount of dry cargo was handled at the Ports of Searsport and Portland, and none in Eastport. Today, the three ports

collectively handle more than 1.2 million tons of dry cargo and bulk per year, including containers. Additionally, Portland and Searsport also handle more than 100 million barrels of petroleum products per year.[ii]

Annual dry cargo tonnage since 1982 is depicted in Figure 2. With the recent recession, the volume of dry cargo dropped sharply, reaching a 20 year low of 800,000 tons in 2009. The last 2 years has seen that cargo rebound by more than 50%, to more than 1.2 million tons in 2011. With improvements in the port facilities as well as the economy, one would expect that growth to continue. The trend in total volume of petroleum shipped through Maine's ports has been generally declining, while the total volume of other cargo had remained relatively constant, with steady increases. The Maritime Administration (MARAD), an agency of the U.S. Department of Transportation, projects a surge in international cargo traffic through U.S. ports over the next 10 to 15 years.[iii] According to one study, North Atlantic ports will need to add at least 43% in additional capacity to accommodate the increased demand for shipping containerized cargo.[iv]

Figure 2



Intermodal Connections

Intermodal connectivity is critical to the long-term success of shipping and handling cargo through Maine's ports. The two most critical modal connectors, highways and rail, provide avenues for moving freight to and from port terminals. The Maritime Administration has been exploring the development of a Short Sea shipping system to aid in reducing the growing amount of freight congestion on our nation's rail and highway systems. Short Sea shipping refers to the movement of freight along coastal and inland waterways. In 2010, as part of MARAD's Marine Highway Program, USDOT Secretary Ray LaHood designated the route from Portland to NY/NJ as one of eight such Marine Highway projects in the country. MARAD is collaborating with the Maine Port Authority (MPA) on the type of service and the development of an ATB (Articulated Tug Barge vessel) that would meet the service

requirements of the route. Next phases include funding the design and construction of ATB's for several of the routes. Portland had re-established a container feeder service, which was recently suspended for economic reasons. The MPA will continue to pursue opportunities for connections with both Halifax and NY/NJ and while doing so will still handle containers at Portland's International Marine Terminal (IMT) site where they can offer a chassis pool, 24/7 access to the terminal, customs inspection facility and a secure location to stage containers.

Maine ports have also been positioning themselves to better support the handling of both on shore and off shore wind components and are educating the industry on the assets available here to handle the delivery of components in support of that development.

Cruise

Maine has enjoyed an increase in coastal cruising programs during recent years and remains a summer home for the cruise operations of American Cruise Line, Blount Small Ship Adventures (previously known as American Canadian Caribbean Line) and a variety of Clipper coastal cruise operations. The ports of Portland and Bar Harbor are deep-draft ports and regularly host vessels of all sizes and all lines. The port of Rockland, which has been a port of call for military ships, is beginning to attract deep-draft cruise passenger vessels. In addition, the ports of Bangor, Belfast, Bucksport, Camden and Eastport continue to flourish as popular boutique ports of call.

Commercial Fishing and Recreation

The Maine coast is over 3,500 miles long and is known worldwide for its beauty, sailing grounds, fishing industry and deep-water ports. Maine and, in particular, the port of Portland is a nationally recognized leader in the commercial fishing industry through its Portland Fish Exchange. In 2010, Maine's fishing industry accounted for over 34% of the total fishing tonnage of New England, with 100 million tons and brings in the highest value per pound of product at $1.90 per pound. The New England average was $1.65 per pound and the national average was $0.55 per pound. Maine also accounts for 82% of the American Lobster harvested in the U.S.

Condition and Adequacy

Industrial

During the past 4 years since the last report card was issued, the Maine Department of Transportation (MaineDOT) and the Maine Port Authority with various funding partners have invested more than $30 million to improve and promote growth in the three industrial ports. Eastport has seen improvements and expansion to the site and laydown areas and the installation of a conveyor system to move bulk forest products, which will help expand its market base. Searsport (Mack Point Facility) has received a new mobile harbor crane and other cargo handling equipment to aid in the movement of a variety of cargos, to include that associated with the growing wind energy market. Portland has seen investments in both the Ocean Gateway facility and the International Marine Terminal. At Ocean Gateway an additional floating berth with associated dredging was completed, which allows for some of the largest cruise ships to call upon the facility and the IMT is currently finishing modifications to the entire facility which increases pier access and capacity and make significant improvements to the yard for the storage and handling of containers and other dry cargos.

Maine's dry cargo facilities are constructed on concrete and steel piles and utilize various techniques like rock anchors and spin fins to provide resistance and capacity for the large vessels that call on those facilities. All three of Maine's dry cargo ports' major piers were constructed in the past 15 years. Generally, these facilities were built to the current industry standard and have a load capacity of 1,000 pounds per square foot. Pier condition is considered good, but annual maintenance of pipe coating and cathodic protection is necessary. New pavement, additional ancillary facilities, additional cargo equipment capacity and continued improvements to the rail and highway systems that serve them, is needed for these ports to remain competitive and viable for Maine's economy.

Intermodal Connections

In Portland Harbor, the waterfront connector and the new improvements to Veteran's Memorial Bridge enhances the connections from the marine terminals in both Portland and South Portland to the interstate highway system and to rail system owned and operated by Pan Am Railways. In Searsport, direct rail access is available to the terminal at Mack Point via the Montreal Maine and Atlantic (MMA) Railroad. The MMA offers double-stack rail clearance from Searsport to Montreal and then via class I connections to the U.S. Midwest. In Rockland, a considerable

amount of cement product is moved via rail and then onto barges for transport to other U.S. markets. These intermodal connections provide a valuable link for effectively moving freight and help to keep this traffic from traveling down the busy Interstate 95 corridor. All three port areas would benefit from improved rail connections and trans-load capacity.

Cruise

Waterfront facilities supporting Maine's cruise industry are adequate for the current market, but need upgrading and expansion to keep up with the increasing demand for port calls. Portland has seen improvements to the Ocean Gateway facility positioning it to better handle the number and size of vessels that can call. Bar Harbor and the Maine Port Authority have just concluded an evaluation of the Bar Harbor Ferry Terminal and have adopted a plan to acquire and develop the ferry terminal into a cruise ship facility with other secondary uses. These changes and improvements to the facility would allow the larger ships to berth at a pier rather than go to an anchorage and tender passengers. According to the Maritime Administration, the industry has seen a 10% growth in ridership over the past 5 years during what would otherwise be considered depressed economic times. Industry data shows that 40% of cruise ship passengers stay at least one night in a port city and each overnight cruise visitor spends an average of $289 per visit on retail, dining, local transit and lodging.[v]

Maine needs to continue to partner with various public and private agencies to develop its waterfront infrastructure in support of the cruise industry. With cruise ships becoming larger and carrying more passengers, the ability to effectively handle these vessels at the various ports of call is essential for continued growth in the market area.

Commercial Fishing

Maine has ranked consistently high in the nation in total commercial landings of fish while the Port of Portland ranked twenty-fourth, Rockland thirty-third and Stonington fortieth out of all United States ports in 2010. The Port of Portland recorded more than 38 million pounds of commercial fish landings in 2010, while Rockland had 22.2 million and Stonington with 17 million. During this same period, the entire state recorded 100 million pounds of commercial fish landings. However, partially due to increased regulations over the years, fish landings, while experiencing modest increases over the past 4 years still are considerably less than the record 356 million pounds recorded in 1950.[vi]

As of March, 2012, twelve waterway projects were either under contract, study or construction by the U.S. Army Corps of Engineers for maintenance dredging or channel improvements serving the coastal communities of Maine. Unfortunately, some of these activities have not been advanced or completed due to either lack of federal funding, regulatory reviews, or execution of cost sharing agreements with the affected municipalities. However, three have been or will be completed this year, and a fourth is about to begin.[vii]

Since 1996, MaineDOT has provided $6.4 million in funding to support the Small Harbor Improvement Program (SHIP) and the U.S. Fish & Wildlife has provided $1 million through the Boating Infrastructure Grants (BIG) program to promote recreational boating facilities. These funds have been provided to 65 coastal communities to help preserve working waterfronts and public access in over 140 projects.[viii] While this report does not focus on recreational activity and development, it does recognize that recreational boating and facilities play an important role in Maine's coastal communities and overall economy.

Safety and Security

In Maine, considerable effort has been made by both public and private operators to perform gap analyses and construct considerable security upgrades to Maine's facilities. These upgrades have been possible largely through annual federal port security grants at Eastport, Searsport and Portland. Continued funding of this program is critical to the long-term safety and security of Maine's facilities.

Investment Needs

MaineDOT reports that an annual investment of at least $2 million is necessary to maintain and upgrade Maine's three industrial ports. Incremental capital investment is also being sought to supplement future bond issues for the following projects:[ix]

- $4.5 million for a dredging project at Searsport to deepen the main channel and $2 million for new bulk handling upgrades.
- $2 million for a warehouse and a downtown breakwater at Eastport and
- $2 million for additional improvements to the International Marine Terminal and Ocean Gateway project in Portland.
- $13 million to advance dredging in Portland Harbor.

In November 2012 Maine voters overwhelmingly approved a transportation bond including $4.8 million for ports. The current outlook is that the use of any voter-approved bonds in 2013 is unlikely further delaying improvements.[x]

Continuous SHIP grants are needed to promote Maine's growing cruise, fishing and recreational maritime industries and continued assessment of market demand and shipping trends is necessary for the advancement of development of a modern container terminal in Searsport.

Conclusions and Recommendations

Maine's industrial ports are in good physical condition and the state has made significant investments over the last four years; however, the ports need continuing improvements to accommodate the demands of the shipping industry. Maine ASCE gives ports and waterways a grade of **C+**.

Maine ASCE makes the following recommendations:

- Continue to invest in maintenance of industrial ports;
- Upgrade containerized cargo capacity to capitalize on opportunities of a growing market;
- Continue to promote the handling of wind components at the three primary facilities in Eastport, Searsport and Portland;
- Continue to work with USDOT and MARAD to invest in ATB's and the development of a marine highway connection between Portland and NY/NJ;
- Program incremental capital improvements to the ports to enhance intermodal connections, such as rail and Short Sea shipping terminals;
- Continue to invest in waterfront development projects through the SHIP program;
- Increase investments in ports supporting the cruise industry to capitalize on the economic impacts of this growing industry;
- Continue to promote and prioritize U.S. Army Corps of Engineers maintenance dredging and channel improvement projects in Maine's navigable waterways.

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[v] http://www.aapa-ports.org/Industry
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[viii] Maine Department of Transportation, Office of Freight Transportation.
[ix] Maine Department of Transportation, Office of Freight Transportation.
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RAILROADS

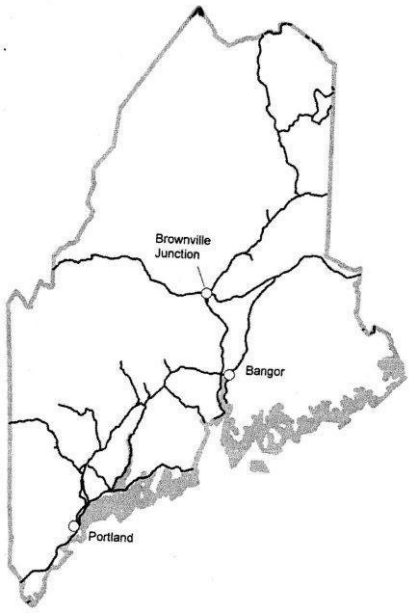
Grade: C

Overview

Maine has 1,154 miles of active railroad and several intermodal facilities, primarily serving the pulp and paper industry. Recent capital projects included track repairs, customer rail sidings and interchange improvements. Rail infrastructure in Maine has improved slightly and MaineDOT's ownership of active railroad in Maine rose from 6% to 30% since 2008.

Background

Rail service is an important component of the transportation mix in Maine and is particularly cost-effective and energy-efficient when moving high-volume, low-value commodities over long distances as it minimizes heavy truck traffic on roads. In 2009, Maine had just less than 4.39 million tons of freight moved annually by rail, ranking it 48th in the nation just behind New Hampshire. The first railroad company in Maine was chartered in 1832 with Bangor to Old Town the first section of track completed. The peak mileage for track in service for freight and passenger rail was in the 1920s with over 2,300 miles. Since the 1920s as lines became uncompetitive, abandonment and eventually removal of track has been typical. When this report was prepared, Maine had 1,154 miles of active railroad, a reduction of 8 miles since the 2008 report. Almost 350 miles were owned by the State (30%), which is an increase from 2008 when only 66 miles of active track was reported owned by the state (less than 6%).[1] The State owns an additional 200 miles of inactive rail right-of-way as well which is an increase of 23 miles from 2008.



Maine is serviced by seven private railroads; four of which form the core of the regional rail network: St. Lawrence & Atlantic Railroad (SLR), Pan Am Railways (formerly Guilford Rail), Montreal, Maine and Atlantic Railway (MMA) and Maine Northern Railroad (MNR). The State leases some of its track to private railroads such as the Maine Eastern Railroad, MNR and the Belfast and Moosehead Lake Railroad. Freight railroads are classified by the Federal Rail Administration (FRA) based on annual operating revenues as follows:

- Class I – annual revenues greater than $359.6 M;
- Class II- annual revenues between $40 million and $359.6 M; and
- Class III- annual revenues under $40 M.

MMA, Pan Am and SLR are all Class II railroads.

The Bangor and Aroostook Railroad was purchased in 2003 by Rail World, Inc. and renamed **Montreal, Maine and Atlantic Railroad** (MMA). MMA owns 233 miles of track in northern and central Maine from Van Buren to Searsport and a line from Brownville Junction to the international boundary west of Jackman and on into Canada. MMA connects with two Class I railroads outside of Maine and connects to Pan Am at the Northern Maine Junction

[1] Complete New England Rail maps are available through MRG, Inc., P.O. Box 5494, Augusta, ME, 04332 or http://www.maine.gov/mdot/utilities/documents/pdf/RailMap2007.pdf

outside of Bangor, with Canadian National (CN) at St. Leonard, New Brunswick, and Eastern Maine Railway at Brownville Junction, Maine. MMA serves the newly reactivated Great Northern Paper mill in East Millinocket.

Pan Am Railways (PAR) rail lines in Maine were originally operated as the Maine Central Railroad and later as the Guilford Rail System (GRS). Based in Waterville, Pan Am's main freight line runs from South Berwick to Mattawamkeag with branches to most of the major paper mills. A critical link for Pan Am is not just their southern mainline, but also their connection to the Canadian provinces through the Eastern Maine Railroad. Pan Am owns a total of 372 miles of rail in Maine and connects to many Class I railroads, as well (CSX, Norfolk Southern and others). Pan Am also connects to the St. Lawrence & Atlantic RR at Danville Junction.

The **St. Lawrence & Atlantic Railroad** (SLR) runs from Portland to Montreal, Canada and interchanges with the Canadian National Railroad (CN). SLR has 85 miles of track in Maine. SLR sold the track from Portland to the Auburn town line to the State, retaining freight rights. SLR operates the 35-acre intermodal terminal facility in Auburn.

Maine Northern Railroad (MNR) is owned by the JD Irving Company. They lease several branches serving Caribou, Presque Isle, Easton and Houlton which the State bought from MMA totaling 233 miles of track since the June 2011. The Aroostook lines are being upgraded with a federal TIGER grant of $10.5 million such that the track rating was raised to 40 and 25 mph for main and branch lines, respectively. With 80% of the work completed as of October 2012, and new agreements with other operators, MNR reports that the tonnage moved has tripled. The construction work will be completed in early 2013.

Other railways operating in Maine include **Maine Eastern Railroad** (MERR) which leases 93 miles of State-owned lines primarily shipping Dragon cement and providing limited passenger service, **Turners Island LLC,** which operates 2 miles of track from the South Portland Marine Rail Cargo Terminal, and **the Eastern Maine Railway** (EMR) which operates 100 miles of track between Brownville Junction and Vanceboro Maine.

Condition and Adequacy

No railroad track in Maine is currently capacity-constrained by volume.

Currently, sections of Maine's active track will not support 286,000-pound rail cars that are becoming the standard with the Class I railroads. The ability to use consistent car types with Class I railroads would reduce handling costs and make systems more efficient. Upgrading the remaining track to accommodate the larger freight rail cars will require significant investment by both the Class II railroads and state/private partnerships.

Issues related to upgrading for greater railcar capacity include the track (rail, ties, ballast, and substructure) and the load ratings of many of the railroad bridges. To support the heavier cars, railroad bridges need to be certified to carry the additional weight, which will require time and resources. Currently, most of Maine's railroad bridges are rated for 263,000 pounds. For some of the bridges on track connecting with Class I corridors out of state, the bridges could be inspected and evaluated, possibly increasing the bridges to the higher rating; this would also identify bridges to improve.

Funding by private rail companies for inspections and upgrades depends on the ability to guarantee a return on that investment through economic activity. As businesses that use the railroad grow, or as new businesses come into the state that will utilize rail, the need for the larger cars becomes more necessary and the cost for the improvements can be justified, for a particular corridor.

Bridge clearance restrictions surrounding the railroad also present an issue. Many bridges are unable to accommodate double-stack containers. Some bridges are owned by the railroads themselves and carry the track structure itself but others are road bridges carrying vehicular traffic crossing over the railroad and are primarily owned and maintained by local, county, and state governments. As these bridges are owned and maintained by governmental bodies, they would be likely only be raised over time when the bridge is due for major rehabilitation or replacement. As both the Maine Department of Transportation (MaineDOT) and municipalities have a back-log

of bridges in need of repair, increasing clearances on all these bridges would not likely occur in the short term, unless a specific initiative is undertaken in a certain corridor identified by the railroad owners as a priority.

SLR is fully cleared for double-stacked containers from Auburn to Montreal, Canada and beyond to the Port of Vancouver, Canada. From points in Canada, double-stacks can continue down to Chicago and points in the mid-western states. This bodes well for long-term rail freight growth in Auburn. MMA also has clearance for double-stack containers from Searsport to Montreal, Canada and then via Class I connections to points in the U.S. Midwest and Canada as well. Searsport's port facility requires upgrades in capacity in order to maximize opportunities of a growing containerized cargo market.

SLR, in conjunction with MDOT and Lewiston Auburn Railroad, is working to re-connect the old Rangeley Branch Line to the Lewiston Auburn Railroad and the St. Lawrence & Atlantic Railroad, add switching track capacity and also provide service to MB Bark in Auburn, ME, investing $3M in infrastructure. This project will allow for future industrial development opportunities on 320 acres of land served by rail. MaineDOT replaced about five miles of missing track on its' Mountain Division line between Westbrook and South Windham in 2011. It still needs to replace about one track mile and to upgrade some 25 miles of existing track to make this rail line ready for service.

The Danville Junction Interchange Project, once complete in 2012 will have upgraded service with some $6M in funding, jointly from Pan Am, SLR, MaineDOT and federal funding.

Pan Am plans to improve their main line to reach Class 3 standards, rating bridges and repairing them as needed to attain 286,000 pound capacity, and have a 3 - year yard rehab program throughout the State. PAR track between Portland and Brunswick has been upgraded and signal work is in progress for extension of Downeaster passenger service to Brunswick for late 2012. PAR is constructing a new interchange with the SLR at Danville, and has installed CWR on the track between Waterville and Portland. The track from Bangor to Portland has been raised to Class 2 standards. IRAP funds are being used for a siding for Turner Egg Farms in 2012.

Pan Am is partnered with Norfolk Southern to improve the "Patriot Corridor" between Albany, New York and Boston, Massachusetts for double-stack service. This partnership will provide a direct benefit to freight rail in Maine, even though double-stack clearance on Pan Am's rail line into Maine is not available yet. Federal funding has been received for improvements in Massachusetts.

The extension of the Somerset (Madison) branch between Madison and North Anson has been restored, and the main segments between Royal Junction and Waterville have been restored since mid-2010.

The frequency and number of rail crossings can inhibit the movement of both passenger and freight trains. In some cases several roadways cross tracks in close proximity creating multiple crossing locations. Working with the local jurisdictions, as well as the MaineDOT, the elimination of these redundant at-grade crossings would provide for faster train travel and safer travel for pedestrians and vehicles, as well as reducing costs for maintenance. Maintenance of the 830 active at-grade crossings is critical. There are 430 crossings with active protection that include lights and gates or lights only. The cost to maintain the crossings is shared between the railroad owner and the state. The remaining are passively protected and have signage only. There have been a total of 15 train/vehicle crashes at crossings in the last four years (2008-2011) including 1 fatality, compared to 24 from 2004-2007 with 2 fatalities.

The MaineDOT provided condition assessments for the 478 miles that it owns. Of the segments assessed, conditions were classified into three categories: 70 miles or 14.6% were good, 200 miles or 41.8% were fair, and 208 miles or 43.6% were poor. Compared to 2008 report, the additional tracks purchased by MaineDOT were either fair or poor condition.

	Good condition	Fair condition	Poor condition
2008 MaineDOT owned	**70 miles (30%)**	**51 miles (22%)**	**109 miles (48%)**
2012 MaineDOT owned	**70 miles (15%)**	**200 miles (42%)**	**208 miles (43%)**

Investment Needs

In recent years, there has been a major effort to create partnerships for investing and improving rail infrastructure in Maine. MaineDOT and private railroads are working jointly where both have interests on several capital projects around the state.

MaineDOT currently owns 550 miles of railroad right-of-way, of which 350 miles are active - moving freight and passengers - and leased to a rail operator. The remaining track is kept passable for repairs and maintenance. Track maintenance standards are those acceptable to the Federal Rail Administration and the MaineDOT.

The Industrial Rail Access Program (IRAP) is a program of MaineDOT to encourage economic development and increased use of rail transportation to fund access for new rail users. Shippers can apply for funding to support infrastructure improvements to provide access or more efficient access to freight rail transportation. MaineDOT IRAP will provide up to a fifty-percent match and the customer provides the rest. The program has awarded $1 million in 2011 and has the same budget in 2012. Currently, the MaineDOT requests funding of approximately $1 million per year for this program. Traditionally Maine has utilized bonds to fund a significant portion of its transportation budget. In 2012 the Maine voters overwhelmingly approved $51.5 million in Transportation bonds including $1 million for IRAP. The current outlook is that the use of voter-approved bonds in 2013 is unlikely.[i]

Maintenance of active state-owned track is included in the responsibilities of the rail companies leasing the track. Needed improvements are funded by the operator, MaineDOT, and federal funding as available.

MaineDOT's 2012-2013 biennial budget for funding crossing projects is $2.4 million, in Federal Highway Administration (FHWA) funding. The FHWA allocation is intended to fund approximately eight to ten crossing improvement projects.

Conclusions and Recommendations

A comprehensive system-wide grade is difficult to determine because much of the system is privately owned and actual condition ratings are not available. Compared to the 2008 report, the State-owned railroad track's conditions rated good or fair improved from 52.6% to 56.4%, though the additional mileage of tracks that the state owns more than doubled. However, given current funding for maintenance this biennium, conditions should improve somewhat in the short term. Joint initiatives with private railroads are important to assuring the system remains efficient and effective. With an identified $1.5 billion gap in funding over the next 10 years for all of Maine's transportation needs, rail funding will be competing for public resources. Most of Maine's railroads are privately funded and future investment to improve the system is directly tied to demand for service increases. In addition to the need for an overall improvement to the economy, additional efficiencies in the system along with increased marketing by rail owners and operators should increase usage of the system which will in turn, provide additional funding for maintenance by the rail owners and operators. Maine ASCE gives Maine's railroads a grade of **C** in 2012.

Maine ASCE makes the following recommendations:

- Continue to fund and promote the IRAP program;
- Continue to work with railroad owners on interchange projects to assure the system's smooth performance;
- Review all agency policies on raising bridges that pass over rail lines. By raising bridges to a 22' height over the long term, double-stack trains will be accommodated, increasing the efficiency and cost effectiveness of the system;
- Continue to invest in at-grade crossing improvements and advocate for increased levels of funding.
- Conduct reviews with municipalities for redundant crossing locations and alternative traffic pattern opportunities should be undertaken to improve efficiency of system; and
- Develop policies to increase and improve intermodal freight transportation, including improving data collection.

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ROADS

Grade: D

Overview

Thirty-eight percent of Maine's major roads have only fair to unacceptable conditions. Due to poor conditions, Maine motorists spend an average of $299 per year in extra vehicle operating costs. Maine is the highest of all New England states in miles of highway under state jurisdiction and the lowest for funding per mile. MaineDOT will not meet legislative goals for roads and bridges unless a $150 million per year gap in funding is resolved.

Background

Maine's highway system is the most critical transportation service for the state's 1.3 million residents and visitors. 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.

Maine is a large, predominantly rural state with a current roadway system of more than 23,000 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 approximately 8,500 miles, or about 37% of that total mileage. Table 1 shows Maine as the highest of all New England states in miles of highway under state jurisdiction and lowest for state or federal funding per mile.

Table 1: New England's Roadway Systems[i]

State	Total System Mileage	State Controlled Mileage (A)	Percent State Controlled	Federal Funds in millions (B) FY2010[ii]	Federal mill/Mile (B/A)	Total State Fund.[iii](C) in Millions	State mill/Mile (C/A)
CT	21,248	3,716	17	$553	$0.14	$1700	$0.457
ME	**22,879**	**8,510**	**37**	**$221**[1]	**$0.02**	**$600**	**$0.071**
MA	35,936	2,830	8	$679	$0.23	$2800	$0.990
NH	15,646	3,981	25	$187	$0.05	$600	$0.151
RI	6,528	1,104	17	$254	$0.23	$400	$0.362
VT	14,406	2,633	18	$226	$0.09	$400	$0.152

Table 1 shows that the size of Maine's roadway system is only surpassed in New England by Massachusetts. MaineDOT controls more than twice the mileage of any other New England DOT. Maine provides a fraction of what other New England states provide for state funds for Roads.

MaineDOT categorizes Maine highway assets into six levels of priorities, called Highway Corridor Priorities (HCP), each with goals that match the importance of that road system to funding (see Table 2 on next page).[iv] For purposes of this report, Maine ASCE focused on the 6,640 miles of MaineDOT-controlled roads that are classified as Highway Corridor Priorities 1 through 4 and the Priority 1 Maine Turnpike Authority-controlled 110-mile turnpike

[1] In 2009 and 2010, American Recovery and Reinvestment Act (ARRA) funds were a needed boost to all state DOT's budgets. As of December 27, 2011, 90% of Maine's nearly $141 million in ARRA funding for roads and bridges had been spent on construction projects with the remaining 10% still under construction. The 2009 and 2010 federal allocations to MaineDOT were temporarily elevated with ARRA funds primarily boosting the paving program.

from Kittery to Augusta. These roads see 79% of the vehicle miles traveled (VMT) in the entire state and provide the state with its primary interstate and intrastate mobility.

Table 2 Maine Roads broken up by Highway Corridor Priority Measures[v]:

Priority	Description	Miles	Approx. VMT % of total
1	Interstate, Turnpike, key principle arterials such as Rt. 1, 2, 9, & 302	1,730	41%
2	Non-interstate, high value arterials	960	12%
3	Remaining arterials & most significant major collectors	1,980	17%
4	Remainder of Major collectors including much of State aid roads	1,970	9%
5	Minor Collectors, almost all State aid	2,480	8%
6	Local Roads & Streets	14,390	13%
Totals:		**23,510**[2]	**100%**

MaineDOT measures Priority 1-5 roads in three areas called Customer Service Levels (CSLs). The CSLs are (1) Safety, (2) Condition and (3) Service. With each measure MaineDOT has applied an A to F grading: A is Excellent; B is Good; C is Fair, D is Poor and F is Unacceptable.

(1) Condition

MaineDOT looks at four measures when producing an overall condition rating: ride quality, pavement condition, roadway strength, and bridge condition.[3] The ranges for ride quality and pavement condition vary according to the priority of the road, e.g. an International Roughness Index (IRI) of 150 inches/mile would be a "D" on a Priority 1 road, but on a Priority 3 road the same IRI would be a "B" (since driver expectations are lower for a "3" road than for a "1" road).[vi] Table 3 shows that 3,417 miles out of 8,649 miles that were rated, or 40% are fair to unacceptable condition. 2,556 miles of Priority 1 through 4 roads (38%of Maine's major roads) have fair to unacceptable conditions.

Table 3 State Highway Miles broken out by customer service level: Condition[vii]

Priority	*Excellent*	*Good*	*Fair*	*Poor*	*Unacceptable*
1	**305**	**433**	**413**	**127**	**101**
2	**189**	**308**	**240**	**129**	**88**
3	**381**	**655**	**458**	**274**	**195**
4	**899**	**523**	**308**	**152**	**71**
5	**748**	**791**	**512**	**246**	**103**
	2,522(28%)	**2,710(30%)**	**1,931(21%)**	**928(10%)**	**558(6%)**

Ride quality and pavement condition are measured every two years for most of Maine's major roads, and annually for the Interstate system, by the MaineDOT's Automatic Road Analyzer (ARAN) vehicle.[viii] The average Pavement Condition Rating (PCR) for the Interstate in Maine has basically stayed the same due to a consistent maintenance paving program and major rehabilitation projects. In 2004 the Interstate averaged a 3.97 PCR, while in 2011 that stayed level at 3.94.[ix] In the 2008 report, MaineASCE referred to the PCR value of 3.51 or greater to be considered good or excellent. From 2008 to 2011 the Interstate dropped from 80% good and excellent to 77% good and excellent; Principal arterials fell from 75% to 73%, and minor arterials fell from 71% to 58%. So while average scores were maintained or improved for the major roads, the number of miles with good or excellent conditions decreased.

Other Condition factors: According to The Road Information Program (TRIP), a non-profit transportation research organization, *Maine's road conditions are currently costing each Maine motorist an average of $299 per year in extra vehicle operating costs (accelerated depreciation, additional repair costs, increased fuel consumption, and increased tire wear), which amounts to over $301 million statewide costs annually.*[x] The average segment of pavement on the MTA rates a 7.5 out of a possible 10.0, decreasing from 2008 when rated a 7.8 out of 10. Average

[2] Road miles in Table 3, 4 and 5 do not total up to 23,510 miles. Only about 95% of priority 1-5 roads have been rated.
[3] Though bridges are reviewed under a different Report Card area, some of their information is included in MaineDOT data under roads and will be utilized as part of the road grades as well.

PCR data for the MTA has stayed relatively level from 3.85 in 2007 to 3.89 in 2011, though the number of miles that are rated good or excellent has dropped from 81% to 75%.[xi] In 2009, the Portland Area Comprehensive Transportation System reported that 85 miles of the Collector road system in the greater Portland area was eligible for pavement preservation only with 115 miles needing additional work, such as full depth reconstruction. In 2012 those numbers were improved with 126 miles now eligible for pavement preservation only and 74 miles needing more substantial work.[xii]

(2) Safety

MaineDOT uses four measures to rate safety: crash history, pavement rutting, paved roadway width, and bridge reliability. As shown by the table 4 below, 82% of Priority 1 roads are providing fair to excellent safety conditions, leaving 18% that continue to have issues (poor or unacceptable). Overall 27% of all priority 1-5 roads continue to show poor or unacceptable safety issues.

Table 4 State Highway Miles broken out by customer service level: Safety[xiii]

Priority	*Excellent*	*Good*	*Fair*	*Poor*	*Unacceptable*
1	257	561	324	192	59
2	277	284	174	94	130
3	486	517	424	224	320
4	333	507	433	347	344
5	337	587	704	364	424
	1690(19%)	2456(27%)	2059(23%)	1221(13%)	1227(14%)

In May 2011, MaineDOT reported that crashes and fatalities on Maine's roads had dropped significantly from 2001 to 2010.[xiv] In 2010, Maine's crash rate was 190.5 per 100 million vehicle miles travelled (mvmt) and fatality rate was 1.11 mvmt which were slightly higher than the national average (186 and 1.10 respectively). In 2011 there were 136 highway fatalities, the lowest since 1959. So not only have the actual numbers decreased, the actual rate has reduced as well. Among the New England states, Maine has had the highest fatality rate consistently from 2006 to 2010, except for in 2008 when New Hampshire tied Maine for the highest fatality rate[xv]. The five New England states typically have been some of the lowest in nation though.

(3) Service

Service consists of three measures: posted roads, posted bridges and congestion. The condition of the roadway can provide inefficiencies each Spring, when approximately **25%** of state highways are eligible for posting (restricted for loads over 23,000 pounds).[xvi] In a 2004 MaineDOT State of the System report using data from 2000, less than 10% of Maine's arterials experienced moderately high or higher congestion. According to MaineDOT in 2011, that number has dropped to 6.4%.[xvii]

As is evident in table 5, a majority of Maine roads provide fair to excellent service and do not have congestion.

Table 5 State Highway Miles broken out by customer service level: Service[xviii]

Priority	*Excellent*	*Good*	*Fair*	*Poor*	*Unacceptable*
1	834	385	148	17	9
2	796	101	33	4	24
3	1533	207	57	166	9
4	1113	83	762	3	3
5	897	78	1434	4	3
	5,173(59%)	854(10%)	2,434(28%)	194(2%)	48(<1%)

Though one might assume the reduction in traffic due to the economy is the reason for the reduction in congestion, in 2011 total statewide vehicle miles travelled has dropped back to approximate 2000 levels. Thus, credit for the reduction in congestion can be given to projects like the MTA's 2000-2004 widening, the MaineDOT's Gorham bypass, improved intersection designs and the Augusta third bridge. The majority of current and future delays will

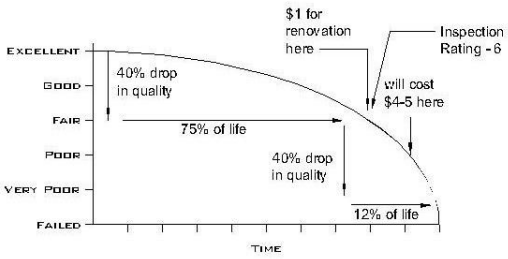
occur on the state's urban arterials, where capacity is limited, volumes are high and land use access is generally uncontrolled. Growth in development along these corridors has resulted in more driveway entrances and left-turn turning movements adding to the congestion.

In Fiscal Year 2011, MaineDOT received $9 million in Congestion Mitigation and Air Quality (CMAQ) federal funds. More than 79% was used to support the Downeaster rail service, leaving less than $1.8 million statewide for park & ride lots and rideshare programs. No CMAQ funds are planned to be used for intersection improvements.[xix]

Investment Needs

In 1976, state investments in highway transportation represented 26% of all state spending. In 2008 that figure was only 11 percent.[xx] When resources are limited, maintenance is often deferred, thus costing the agency more and pushing the additional costs into future years. Maine is in the middle of this situation today. **The Maine Economic Growth Council March 2012 report "Measures of Growth In Focus"**[xxi] gave the indicator "Transportation" a "red flag," indicating that Maine must "reconcile the shortcomings of the existing funding regime…" **According to the Hartgen Report,**[4] MaineDOT has dropped in its national ranking in state highway performance and cost effectiveness, as measured by the Reason Foundation, from 12th in 2001 to 22nd in 2006 to 32nd in 2008. [xxii] Under-investing in our road system for many years has created a growing backlog of unmet needs that is severely burdening our state today.

As seen by the **Pavement Life Cycle** graphic[xxiii] to the right, preserving the investment of a "built" road needs to occur when the pavement condition rating reaches "fair." In 2008 the MaineDOT paving budgets only funded half of the needed pavement preservation program.[xxiv] The unacceptable condition rating for Priority 1-3 roads is nine percent. Priority 1-3 roads carry 70% of Maine's traffic. Without appropriate levels of sustainable funding unacceptable roadways will continue to increase.



PAVEMENT LIFE CYCLE

New MaineDOT Goals

Per the Maine State Law, LD 1753 which was passed into law in Spring 2012, the "Right-Sized" goals are[xxv]:

Priority 1 and 2 highways: Eliminate all CSL "D"s and "F"s in 10 years.
Priority 3 highways: Eliminate all "D"s and "F"s in 15 years.
Priority 4 highways: Implement a program to maintain "Ride Quality" at a "C" or better in 5 years
Priority 5 highways: Continue annual 600 miles of light capital paving ("skinny" mix program), returning every 7 years.

The cost to meet the goals for highways for 2014 and 2015 is approximately $504 million.[xxvi] The current funding level for 2012 and 2013 is slightly less than $400 million[xxvii]. In 2010, the MaineDOT updated its statewide long-range transportation plan, *Connecting Maine*, which reported a 10-year funding gap of $3.3 billion, of which $2.7 Billion was for highways and bridges. With the new Customer Service Levels in mind, the MaineDOT reports that they have reduced the gap of funding for highways and bridges by nearly half, but it is still averages approximately $150 million per year over the next 10 years.[xxviii] Past Maine federal funds have been in the $155 million per year range, though current levels are expected to be $178 million for next 3 years under MAP-21, the federal Surface Transportation legislation passed in July 2012 according to MaineDOT (flat funding considering inflation).

Traditionally Maine has utilized bonds to fund a significant portion of its transportation budget. In November 2012 the Maine voters overwhelmingly approved a bond referendum for transportation of $51.5 million. The current outlook is that the use of voter-approved bonds in 2013 is unlikely. [xxix] MaineASCE is concerned that without

[4] The study measured the performance of state-owned roads and highways from 1984 to 2008 in 13 different categories, including traffic fatalities, congestion, pavement condition, bridge condition, highway maintenance and administrative costs.

replacement funds from other sources, the likelihood of meeting the goals set out in LD 1753 and the infrastructure investments and benefits associated with this proposed borrowing, will be further delayed.

The MTA collects 100% of its revenues from toll and concessions and does not receive any state or federal funds. MTA operating budgets have been reduced 5 years in a row, and capital cost projections for the next five-year period, especially for bridges and paving, required a 20% toll increase in November 2012.

Conclusions and Recommendations

Current investment levels by the state are not sufficient to address the growing needs of the system. Over the next ten years, MaineDOT will not meet goals for roads and bridges set out by the Legislature in 2012, unless a $150 million per year gap in funding is resolved. 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. Though there has been slight improvement since ASCE last graded in 2008, due to temporary ARRA funding, reduced fatality rates and a reduction in vehicle miles travelled due to economic conditions, Maine ASCE continues to rank Maine roads as a **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, and expand to new sources of funding including the General Fund, as continued reliance on gas tax for majority of MaineDOT funding will not suffice;
- To meet the goals as set out by statute in 2012, fully fund the Pavement Preservation Program; the Light Capital Paving Program; and the other necessary highway reconstruction and paving programs; and
- MaineDOT and its partners should continue simple operational techniques for congestion mitigation, such as intersection improvements and land use policies and also continue to design and construct bypasses and capacity enhancements where required.

Sources:

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[x] October 2012 TRIP report "*MAINE TRANSPORTATION BY THE NUMBERS:* Meeting the State's Need for Safe and Efficient Mobility"
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[xiv] Office of Safety, Maine DOT 05/15/2012 and NHTSA website www.nhtsa.gov/fars
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[xvi] Maine DOT September 24, 2008 & May 12, 2012
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