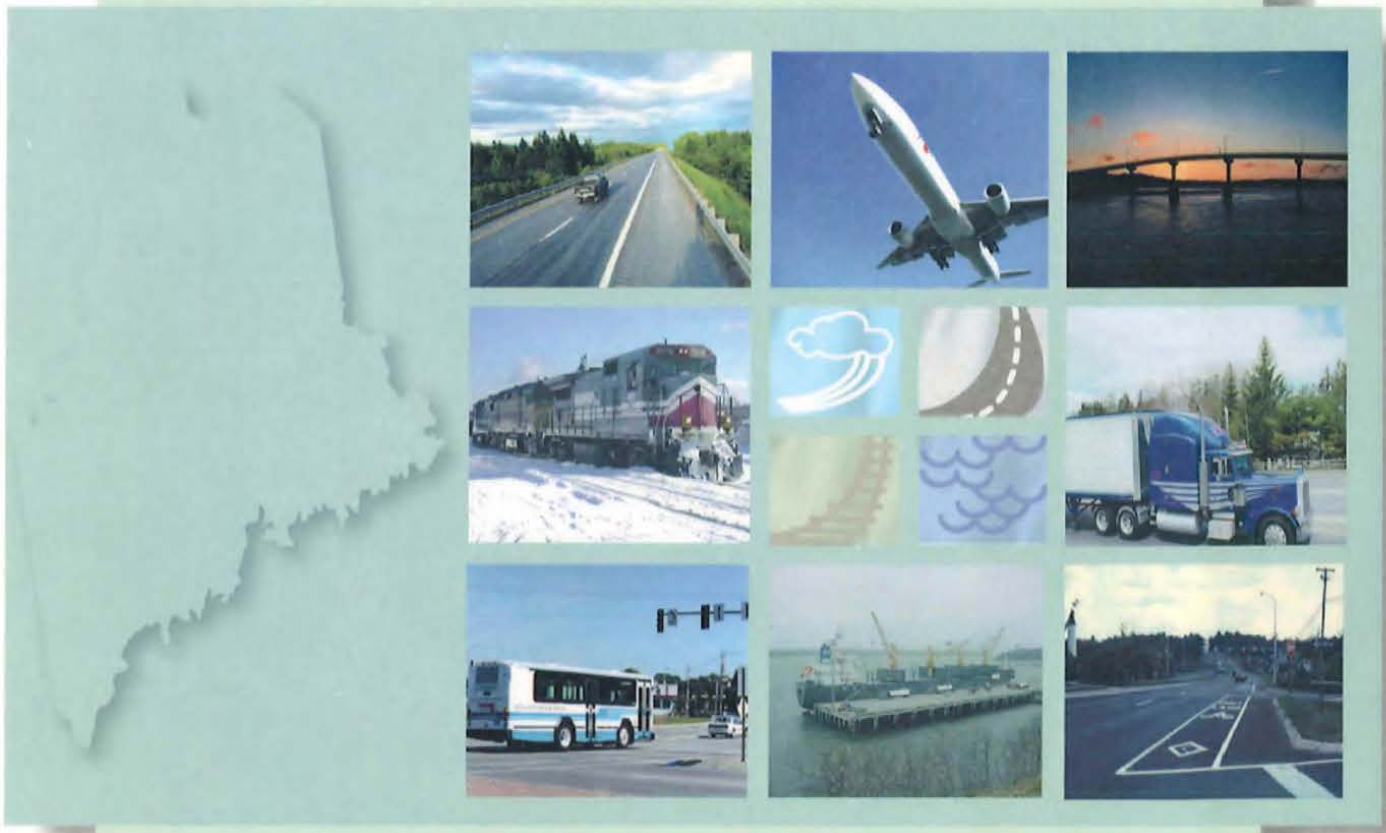
# The Future of Transportation Funding in Maine



A Report to the
Joint Standing Committee on Transportation
122nd Maine Legislature

Prepared by
The Maine Department of Transportation and
The Maine Turnpike Authority

April 2006

# Contents

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

JOHN ELIAS BALDACCI
GOVERNOR

DAVID A. COLE
COMMISSIONER

April 4, 2006

Senator Dennis Damon
Representative Boyd Marley
Senator Christine Savage
Representative Terrence McKenney
Members of the Joint Standing Committee on Transportation

Dear Colleagues:

Pursuant to 2004 Public Law, Chapter 690 and subsequent direction from the Joint Standing Committee on Transportation, I am pleased to submit the attached report to you entitled, *"The Future of Transportation Funding in Maine."*

The report attempts to present you, the Governor, your legislative colleagues, and the general public, with a general assessment of the funding challenges facing transportation in Maine, in the context of the associated transportation needs.

The first question we sought to address was the sustainability of Maine's primary source of funding for the state's highway and bridge maintenance and capital program responsibilities, the motor fuels tax. MaineDOT engaged the Margaret Chase Smith Policy Center at the University of Maine to conduct research on the viability of the motor fuels tax for funding transportation needs in the long term, and to explore alternative financing options that might have the potential to supplement or replace Maine's motor fuels tax. The good news is that the decline of the motor fuels tax appears to be gradual, which does provide policy-makers with the time to evaluate and gradually implement alternatives. However, it is also true that the current funding paradigm appears to provide insufficient resources to meet projected transportation needs, even if current funding sources keep pace with inflation—and they do not. The report also speaks to the declining purchasing power of motor fuels tax revenue. Even with Maine's gas tax being adjusted annually to the Consumer Price Index, it provides only about one-third the purchasing power that it did in the 1960s. The Margaret Chase Smith Center's full report is attached and summarized.

The Maine Turnpike Authority (MTA) partnered with MaineDOT in the preparation of this report. The MTA efforts, along with those of Maine's Regional Planning Organizations, (RPOs) resulted in a variety of contributions to this effort. The MTA joined us in presenting alternative funding scenarios at seven regional forums held throughout the state last fall, which were co-sponsored by MaineDOT and the RPOs. The MTA also prepared a report entitled, "The Transportation Funding Crisis: Tolls are the Answer," which is also attached and summarized in this report. The MTA report focuses on particular strategies and applications related to tolling. Tolling is perhaps the best known and most tested alternative funding mechanism in Maine. The report describes how this method is being applied in other jurisdictions, and also how technology has expanded its use. The report also includes summaries of recent public surveys, which will provide you with some insight regarding the public's view of funding alternatives.

The overall report is an effort to present alternative funding mechanisms either in use or being considered in other jurisdictions. We also reviewed current funding sources and strategies involving other funds, as well as other public and private entities. In addition, we've provided some insight into the status of federal sources of funding, and given some indication about where various stakeholders believe traditional funding sources are headed. The latter issue explores concerns from a number of sources about the solvency of the federal Highway Trust Fund in the near term and the impact this might have on states.

One conclusion that I reached as this work unfolded is that there is a need, for MaineDOT, the MTA, and other key transportation agencies, to receive direct guidance from policy-makers so that they can pursue specific options for future funding consideration. Which approach(es) Maine chooses to address the likely decline of motor fuel tax revenue to meet future state highway and bridge needs, or how to address funding for public transportation systems like passenger rail or local and regional transit services, will depend largely on the involvement of the public and policy-makers.

I strongly recommend that this analysis, along with other recent work on transportation funding issues, becomes the basis for a dialogue that can lead to firm direction to transportation agencies. I believe that only through such a dialog can we develop the specific funding strategies that will be necessary to meet the growing gap between resources and the needs of Maine's transportation system.

Respectfully submitted;

David A. Cole
Commissioner

# Executive Summary

**The Directive**

This report was prepared in response to a directive, from Governor John E. Baldacci and the Maine Legislature's Joint Standing Committee on Transportation, which requested the Maine Department of Transportation (MaineDOT) to lead a discussion and report back on the future of transportation funding in Maine.

**The Issue**

Of particular concern for the State of Maine is the erosion of the motor fuels tax as the primary basis for funding state-jurisdiction road infrastructure. Transportation policy makers, at both the state and national level, have identified a number of threats that will affect motor fuels tax revenue for decades to come, including more stringent fuel-economy standards, a probable increase in the market share for alternative fuel and hybrid vehicles, the declining purchasing power of motor fuel tax revenues, and new environmental and energy regulations.

Construction cost inflation and significant increases in energy costs have reduced the purchasing power of the motor fuels tax. The cost of construction materials has significantly outpaced the rate of consumer inflation, due to increased asphalt and fuel costs, and to worldwide demand. Increasing fuel prices will stimulate even more new technologies and innovations, such as hybrid vehicles, which will effectively reduce motors fuels tax income. Sales of hybrid vehicles are growing, and as many as one million hybrid vehicles may soon be produced annually. As oil production declines, a transition to alternative energy sources will occur. Alternative fuels are now taxed at tax rates considerably less than the equivalent rate for gasoline. As alternative fuels and more efficient vehicles come into greater use, motor fuels tax revenues will be less viable to support transportation improvements. Federal efforts to increase fuel efficiency may impact motor fuels tax revenues available to Maine by decreasing the amount of fuel used. While increased fuel efficiency has benefits, it also reduces the revenue stream from the motor fuels tax.

**The Impact on Maine**

Maine's tax on gasoline is currently 25.9 cents per gallon, and on diesel fuel, 27 cents per gallon. Maine taxes on internal combustion engine fuels are indexed to inflation using the Consumer Price Index, with adjustments subject to legislative review each biennium. In 2004, motor fuels tax revenues were 8% of Maine's total revenues and 68% of Highway Fund revenues, percentages that have changed dramatically over 30 years. A 2005 Maine Better Transportation Association report entitled *"Losing Ground,"* shows that the Highway Fund has grown at one-third the rate of other state revenues such as General Fund, local property tax, and motor vehicle excise revenues.

For this report, MaineDOT contracted with the Margaret Chase Smith Policy Center (MCSPC) to research the viability of the motor fuels tax for funding long-term transportation needs, and to identify alternatives to the tax. The MCSPC determined that there is a potential for state motor fuels tax revenues to decrease by as much as 10%, due to improved fuel economy, in the next decade.

In addition to the issue of long-term sustainability of Maine's motor fuel tax, MaineDOT faces issues of sustainable funding for *non-highway-and-bridge* transportation improvements. In the mid-1940s, the Maine Constitution was amended to protect motor fuels tax revenues that accrue to the Highway Fund, and to ensure they are expended only for the cost of construction, reconstruction, maintenance, and repair of public highways and bridges; for payment of debt for such construction; for state enforcement of traffic laws; and for the cost of administration.

**A National Concern**

The sustainability of *federal* transportation funding is also at risk. A U.S. Chamber of Commerce study forecasts that the Highway Account of the federal Highway Trust Fund (HTF) may become insolvent by 2010, and the Transit Account by 2014. The study finds that existing revenues into the Trust Fund leave significant shortfalls in meeting the federal "share" of capital investments needed to maintain and improve America's highway and transit systems. In response to this concern, Congress included new policy and funding studies in "SAFETEA-LU," ("Safe, Accountable, Flexible, and Efficient Transportation Equity Act: A Legacy for Users.") the new federal surface transportation law. The law creates a *National Surface Transportation Infrastructure Financing Commission* to study highway and transit funding and consider alternative revenue approaches, and the *National Surface Transportation Policy and Revenue Study Commission* to study the condition of the surface transportation system, identify future needs, and develop financing recommendations.

The National Conference of State Legislatures (NCSL) also initiated its *Transportation Funding Partnership Project* to examine long-term financing issues and potential funding solutions. The project involves legislators, legislative staff, transportation organizations, and private sector interests. A report on the project findings will be released in 2006. The American Association of State Highway and Transportation Officials (AASHTO) also formed "policy teams" to develop recommendations for the commissions established in SAFETEA-LU.

**The "Infrastructure Deficit"**

The importance of transportation to the economy is widely accepted. Policymakers at national, regional, state, and local levels are becoming more involved in decisions relating to investment in transportation, hoping to contribute to increases in economic productivity and growth. And while Maine wrestles with the question of whether the motor fuels tax, the primary source of funding for transportation infrastructure improvements, is sustainable for the long term, the state is also dealing with an aging infrastructure that has growing demands placed upon it.

While the percentage of state revenues expended on transportation infrastructure has decreased in recent decades, long-term transportation needs in Maine have continued to grow. The cost to maintain the current performance of the existing transportation system over the next 20 years is estimated at about $8 billion. To advance new and expanded transportation infrastructure and programs, as much as an additional $12 billion will be required. Current revenues provided by *all* levels of government - federal, state, and local - are not sufficient to maintain existing transportation infrastructure, let alone to invest in expansion or the enhancements necessary to meet the growing demands on the system.

**A Need to Invest Strategically**

Maine must identify sustainable sources of funding to support investment in transportation, and funding that *is* available to MaineDOT and other transportation agencies must be invested efficiently and strategically. We must continually seek opportunities to maximize effectiveness and efficiency by establishing realistic goals and expectations, utilizing new technologies, and encouraging innovation. Investments in transportation must leverage new resources, both public and private, particularly in areas where there is regional or statewide economic benefit.

In 2005, MaineDOT commissioned the state's regional Economic Development Districts (EDDs) to help identify opportunities where transportation investments could support regional economic development. Maine's EDDs produced *Regional Transportation Assessments* that identified priority corridors

within their regions, and identified opportunities where transportation investment might support regional land use and economic development goals and initiatives. These *"Corridors of Regional and Economic Significance,"* and corresponding recommendations will guide decision-makers in prioritizing strategic transportation investments. These corridors may also help federal transportation officials and Maine's Congressional delegation as they consider future requests for allocations of federal funding for transportation.

**Options: Margaret Chase Smith Policy Center Research**

As part of its effort, the Margaret Chase Smith Policy Center conducted a literature search to explore alternative financing strategies to supplement or replace Maine's motor fuels tax. The study identified 16 options in four broad categories - *taxes, direct pricing, tolls, and fees,* - assessed their benefits, and identified corresponding concerns. Of the options identified, some may not be applicable to Maine, but several others appear to merit consideration, including:

- Mileage-Based Fees: The "Oregon Experiment" - an ongoing research project in Oregon, which uses mileage-based charges to replace the motor fuels tax. Oregon began its pilot program in 2005 with 20 vehicles, and expanded it to some 200 vehicles in 2006. Oregon appears to have addressed early concerns, and expects publish results from the pilot by 2007.
- Value Pricing/Managed Lanes - "Value pricing" or "managed lanes" systems allow motorists to pay their way out of traffic by placing a value on their time. Value pricing is primarily practicable on urban highway systems where multiple lanes exist. Congestion is managed by designating lanes for high-occupancy vehicles (HOV lanes), on either a toll-free or variable-toll basis.
- Distance-Based (Vehicle) Fees/Price Variability - Under a system of distance-based vehicle fees, the current fixed price of owning a vehicle would be replaced with a variable price—such as variable registration, insurance, and/or title fees—based on vehicle-miles traveled. Under this model, motorists can control costs by adjusting driving habits.

Whatever options are considered, equity, suitability and acceptability criteria must be evaluated.

**Other Viable Options for Consideration in Maine**

In addition to options identified in the MCSPC research other viable funding options include:

- **"Public/Public" and "Public/Private" Partnerships** - Transportation agencies can leverage investments in, and share responsibility for, transportation infrastructure projects, using partnerships between state and local governments, and partnerships between the state and private entities. MaineDOT encourages local partnerships through "matching" funding arrangements for infrastructure improvements, and has also leveraged private investments in highway/bridge construction, rail access, public transportation, and traveler information.
- **Tolls: The Maine Turnpike Authority (MTA)** - MaineDOT and the MTA have worked for over 50 years to foster a partnership—one in which the Turnpike is recognized as a vital component of the transportation system. In 1997, MaineDOT and the MTA commissioned a "Statewide Transportation Partnering Study," which examined ways the two agencies might work together to finance transportation improvements. The study identified ways that MaineDOT and the MTA can work together to increase the amount of bonded debt that can be leveraged for infrastructure and maintenance improvements. Options include:
  - generation of new revenues through expanded use of tolling on the state's transportation system, collected by the MTA, for use by MaineDOT to support capital needs; and

- issuance of "Conduit Revenue Bonds" by the MTA supported by new or expanded toll revenues or other new sources of funds.

Also, federal law now imposes some limitations on the establishment of tolls on existing Federal Aid Highways. Innovative new financing tools and flexibility provided for in SAFETEA-LU may enable new "Public/Quasi-Public" models for cooperation between MaineDOT and the MTA. The new provisions in SAFETEA-LU include:

- pilot projects to collect tolls for *construction* on the Interstate Highway system;
- pilot projects to collect tolls for *reconstruction/rehabilitation* on the Interstate system;
- $59 million for variable-pricing pilot programs to manage congestion; and
- Express Lane demonstration projects, for tolling to manage congestion.

The MTA also presents new opportunities for debt financing. In January 2006, the Governor's Capital Transportation Funding Working Group submitted a report assessing impacts of FY 2006-2007 Biennial Capital Work Plan project deferrals, and recommendations as to how to mitigate those impacts. Working Group recommendations included debt-financing components that seek to address the short-term funding deficiencies. The MTA has produced findings and recommendations that may be similarly applicable. In particular, certain bonding instruments appear to hold promise. Given Maine's currently favorable position in the financial markets, the state and the MTA could improve economic opportunities by leveraging available capital—funding long-term needs by spreading costs over a project's lifespan.

The MTA report recommends consideration of use of federally enabled "Grant Anticipation Revenue Vehicles (GARVEE)," and/or of new "Conduit Issued Revenue Bonds." Maine used a GARVEE, secured by future receipt of federal transportation funding, on the Waldo/Hancock Bridge Replacement Project. Also, Conduit Issued Revenue Bonds could be issued by third parties such as the MTA or the Maine Municipal Bond Bank, for non-toll bond programs, to support capital transportation investments. While either instrument would incur long-term debt, such costs should be measured against Maine's ability to meet its transportation needs, the risk of lost economic opportunities, and inflationary pressures that could increase the costs of delayed projects. These forms of debt could be structured so as *not* to pledge the full faith and credit of the state, while still receiving favorable interest rates in the financial markets.

**Educating and Gathering Input from the Public**

Together, MaineDOT and the Maine Turnpike Authority (MTA) have led a number of efforts to promote discussion and seek input on future funding needs and challenges, including statewide focus groups and forums, and an MTA survey on transportation and funding issues.

While outreach efforts indicate that the public believes that motor fuels tax will remain the primary source of funding for highway and bridge needs, there is also significant sentiment that tolling is the 'fairest' method for raising revenues for these needs. Given that many aspects of the statewide highway system may not be well-suited to tolling, (rural road systems, for example) these results indicate strong support for both methods

This "Report on the Future of Transportation Funding in Maine" stresses the importance of new and expanded transportation infrastructure for Maine's current and future economic opportunities, and identifies financing options to consider in closing the "Infrastructure Deficit" between needs and revenue. What options might be most viable for Maine is a question to be answered by the Maine Legislature. MaineDOT and the Maine Turnpike Authority stand ready to assist by providing resources and support as these difficult questions are considered.

# Findings and Conclusions

*"Current transportation revenues at all levels of government are not sufficient to maintain or improve the nation's surface transportation system."*

National Chamber Foundation; 2005; "Future Highway and Public Transportation Finance Study."

## Legislative Directive

In 2004, Governor Baldacci and the Maine Legislature's Join Standing Committee on Transportation directed the Maine Department of Transportation (MaineDOT) to *lead a discussion and report back on the future of transportation funding in Maine.* Specifically, MaineDOT was directed as follows:

***Sec. G-1. Report on strategies to address the State's transportation infrastructure deficit.*** *The Commissioner of Transportation shall prepare and deliver to the joint standing committee of the Legislature having jurisdiction over transportation matters by February 15, 2005[1] a report containing research findings and recommendations regarding strategies to address the State's transportation infrastructure deficit including all modes of travel. These strategies should not rely on significant revisions to existing laws that establish constitutionally protected Highway Fund revenues. These strategies should include, but need not be limited to, expanded use of public-private and state-municipal partnerships, revision of match requirements to stretch existing federal funding, expanded use of tolling, new or expanded collaboration with the Maine Turnpike Authority and other local or regional transportation agencies, innovative cash management and financing and increased coordination with economic development agencies."*[2]

## The Sustainability of Transportation Funding in Maine

In the United States, the primary source of funding for transportation is the motor fuels tax. Of particular concern for the state of Maine is the erosion of the motor fuels tax as the primary basis for funding state-

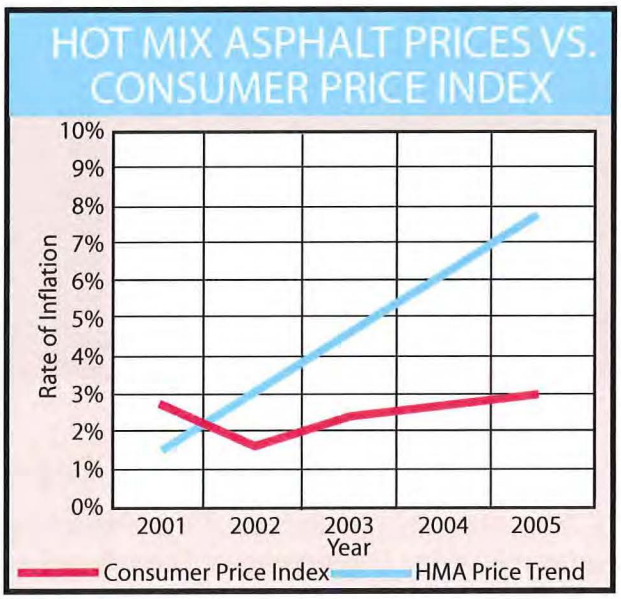
1 In February of 2005, MaineDOT presented "Transportation 2025" to the Joint Standing Committee on Transportation. That report outlined the process that led to the development of this report.

2 2004 Public law, CHAPTER 690, S.P. 769 - L.D. 1934, An Act To Make Additional allocations from the Highway Fund and Other Funds for the Expenditures of State Government and To Change Certain Provisions of State Law Necessary to the Proper Operations of State Government for the Fiscal Years Ending June 30, 2004 and June 30, 2005

jurisdiction road infrastructure. Transportation policy makers have identified a number of threats to motor fuels tax revenue, including more stringent fuel economy standards, a probable increase in the market share for alternative fuel and hybrid vehicles, the declining purchasing power of motor fuel tax revenues, and increasing demands on Maine's transportation infrastructure, coupled with increasing costs of materials for transportation projects.

## Factors that Impact Motor Fuel Tax Revenues

Inflation, rising fuel prices, new automotive technology, and new environmental and energy regulations will all affect revenues from highway user fees for decades to come.




### Inflation

Construction cost inflation and significant increases in energy costs have dramatically reduced the purchasing power of the motor fuels tax. The cost of construction materials has significantly outpaced the rate of consumer inflation, due in large part to increased asphalt and fuel costs, as well as demand from the Asian economic expansion. There has been an upward trend of the average price per ton of hot mix asphalt (HMA) in Maine over the past five years, compared to the Consumer Price Index (CPI).

*"A 22 percent increase in the cost of materials used for highway and street construction over the two past years is eroding the impact of the new federal highway bill and will likely limit the ability of the states to meet their ever-growing transportation needs...In 2005 alone, highway contractors paid 13 percent more for materials over the previous year. By contrast, the overall rate of inflation, as measured by the consumer price index, was just 3.4 percent."*

American Road and Transportation Builders Association; January 2006; "Economics and Research Analysis."

### Automotive Technology

Increasing fuel prices will stimulate even more new technologies and innovations, such as hybrid vehicles, which will effectively reduce motor fuels tax income. Nationally, sales of hybrid vehicles have grown by 960% since 2000, and by the end of the decade it is expected that some 500,000 to 1,000,000 hybrid vehicles will be produced annually. According to the study (commissioned by MaineDOT for this report) by the Margaret Chase Smith Policy Center (MCSPC) at the University of Maine, *"The increasing market share for alternative fuel and hybrid vehicles also may lead to an erosion of the base of the motor fuel excise tax. This is especially true given the recently adopted National Energy Bill 74-26, which gives incentives for alternative and hybrid fuel vehicles. These incentives include tax credits for purchases of hybrids, based on fuel economy, that will range from $250 to $3,400. Hybrids currently comprise 0.12% of the Maine passenger vehicle fleet, and 1.52% of the model year 2005 vehicles available."*[3]

3 Margaret Chase Smith Policy Center; January 20, 2006; "Sustainable Transportation Funding for Maine's Future."

**Energy**

As petroleum production declines during the next few decades, a transition to unconventional energy sources will occur. Alternative fuels, (e.g., ethanol and propane) are presently subject to tax rates that are considerably less than the equivalent tax rate for gasoline. As alternative fuels and more efficient vehicles come into use, the linkage between motor fuels tax revenue and the use of transportation facilities will weaken. With the inevitable decline of petroleum resources and the emergence of new technologies, it is reasonable to assume the use of non-petroleum fuels will increase and thus, motor fuels tax revenues will decline.

**Regulatory Developments and Incentives**

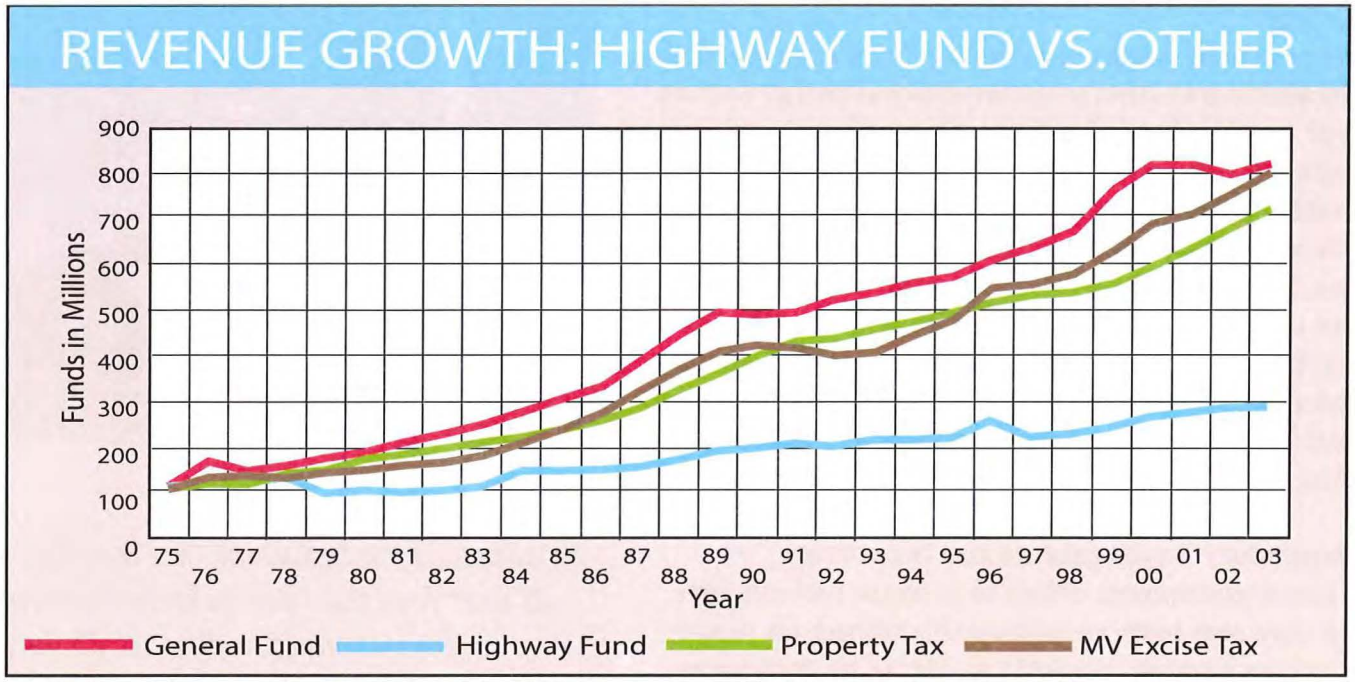
Federal government efforts to increase fuel efficiency may also have an unfavorable impact on motor fuels tax revenue available to Maine by decreasing the amount of fuel that is used. While increased fuel efficiency has many benefits, it also has the effect of reducing the revenue stream from the motor fuels tax. The National Highway Traffic Safety Administration has proposed a plan to reform the Corporate Average Fuel Economy (CAFE) standards for SUV's, pickups, and mini-vans by 2011. The final rule for this proposal is expected to be issued by April 2006. Once implemented, the plan "is expected to save ten billion gallons of gasoline in the years to come," according to U.S. Department of Transportation Secretary Norman Y. Mineta. Federal tax incentives for the purchase of low-emission and hybrid vehicles that get better mileage than traditional automobiles could also decrease revenues from the motor fuels tax. Changes occurring in Maine, which will allow the sale of new diesel-fueled vehicles in 2007, may impact revenues from motor fuels taxes due to the better fuel economy that diesel-fueled vehicles achieve when compared with gasoline-fueled vehicles.

*"(Adjusted for Inflation), the average of all user fees paid per vehicle highway-mile-traveled for the last 25 years ($0.035 per mile) is about half of what it was in the 1960s ($0.06 per mile)."*

Transportation Research Board; "Special Report 285, Fuel Tax and Alternatives for Transportation Funding." ($/mile in 2001 dollars)

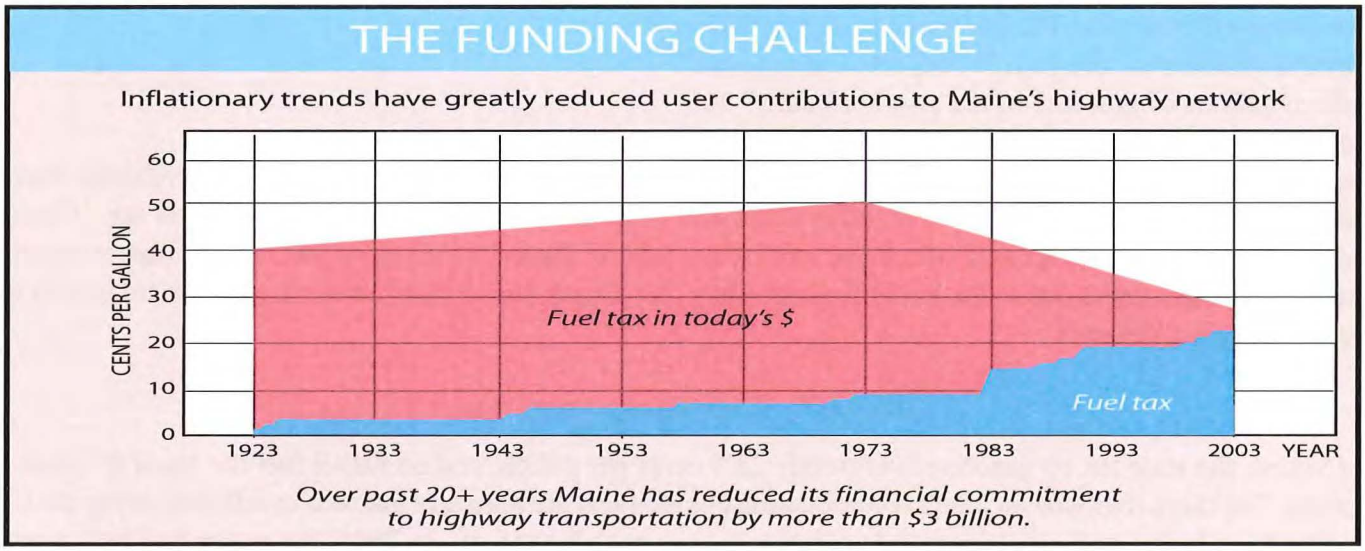
## Maine's State Motor Fuels Tax

In Maine, the state tax on gasoline is currently 25.9 cents per gallon, and on diesel fuel the tax is 27 cents per gallon. The taxes imposed on internal combustion engine fuels are annually indexed to inflation using the Consumer Price Index, and are subject to legislative review each biennium. In 2004, the motor fuel tax revenues were 8% of the state's total revenue and 68% of the Highway Fund revenue, percentages that have changed dramatically over the last 30 years. In 2005, the Maine Better Transportation Association released *"Losing Ground,"* a report on health of Maine's Highway Fund. That report shows that the Highway Fund has grown at only one-third the rate of other major state revenues, such as General Fund revenues, local property tax revenues, and motor vehicle excise tax revenues.

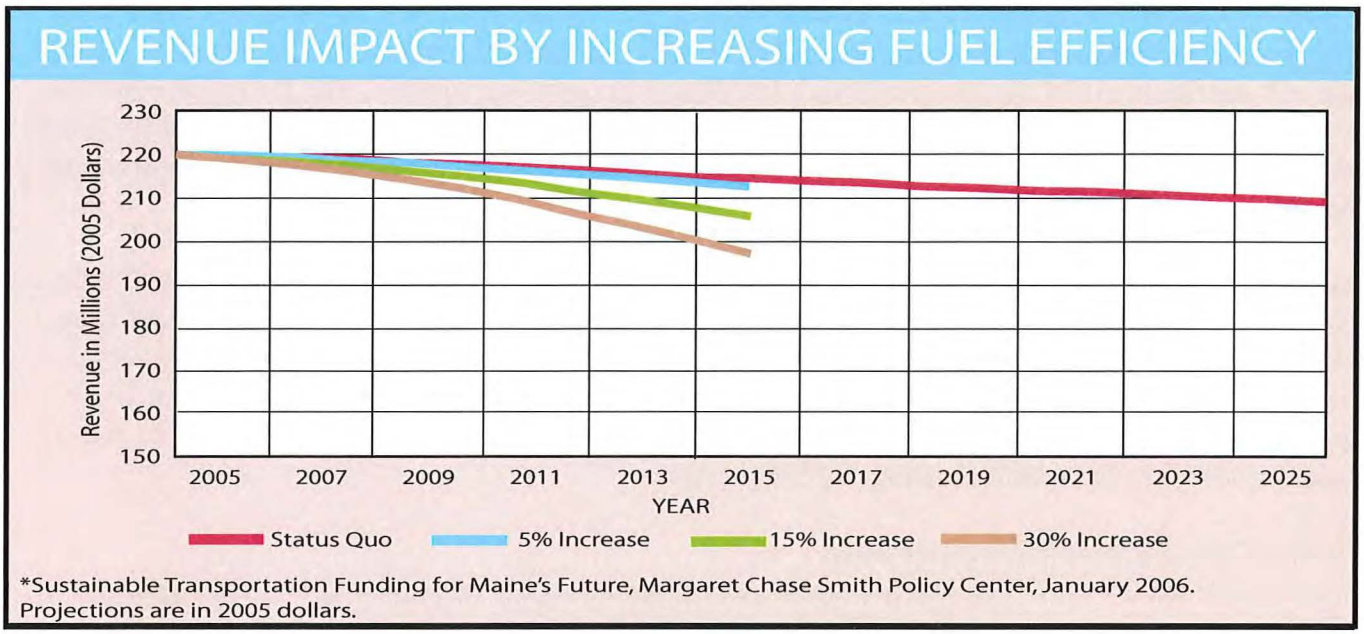



Maine Better Transportation Association; July 2005; "Losing Ground": A Report on the State of Maine's Highway Fund."

Long-term inflationary trends have not only caused the growth in Highway Fund revenue to lag behind other state revenues, but it has greatly reduced the user contribution to Maine's transportation network. In 1927, Maine's motor fuel tax was set at 4 cents per gallon. In today's dollars that would be equivalent to 42 cents per gallon. While the costs of transportation improvements continue to climb, highway users are actually paying less (in terms of real dollars) to use Maine's highway system than they paid in the 1920s.




In its study for this report, the Margaret Chase Smith Policy Center examined the revenue impacts (on the motor fuels tax) of increasing fuel efficiency over ten years and beyond, based on three different scenarios: 5 percent, 15 percent, and 30 percent increases in vehicle-fleet fuel economy (all scenarios are technically feasible with current technology). Based on this exercise, the report determined that there is a reasonable potential for as much as a 10% decrease in state motor fuels tax revenues, due to improved fuel economy, the next decade alone.

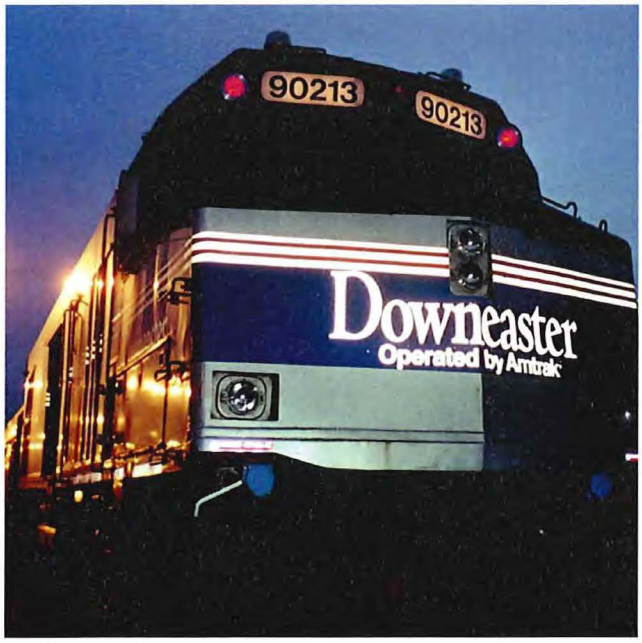



*Sustainable Transportation Funding for Maine's Future, Margaret Chase Smith Policy Center, January 2006. Projections are in 2005 dollars.

## Funding *Non*-Highway-and-Bridge Transportation

### Maine's Constitutionally Dedicated Highway Fund

In the mid-1940s, the Maine Constitution was amended to ensure that motor fuels tax revenues that accrue to the Highway Fund are expended only for the cost of construction, reconstruction, maintenance, and repair of public highways and bridges; for payment of debt for such construction; for state enforcement of traffic laws; and for the cost of administration. Thus, the Highway Fund is truly a "highway fund," and cannot be used for construction, reconstruction, maintenance, and repair of *non*-highway-and-bridge transportation improvements and services, meaning that operating, capital, and maintenance costs for *non*-highway-and-bridge transportation must be paid-for by alternative means.




### Operating Costs for Public Transportation

Since the second half of the 20th century, most public transportation services have required operating subsidies. Sources of these subsidies include the Federal Transit Administration (FTA), state funds, and local municipalities.

Currently, FTA funds cover less that 50% of the operating subsidies for Maine's fixed-route bus services, and the remainder must come from state and local revenues. Additionally, in both urban and rural areas, "demand-response" services require increased operating support to supplement Medicare funding, and to provide additional services for transportation not covered by Medicare.

A stable source of operating assistance is also needed for Maine's passenger rail service. The *Downeaster* passenger rail service between Portland and Boston currently relies on federal Congestion Mitigation and Air Quality (CMAQ) Program funds for 80% of its operating subsidy. The *Downeaster* will not be eligible for these funds beyond 2009. By executive order, Governor Baldacci created the Task Force on Passenger Rail Funding, in December 2004; that group is scheduled to report its findings and recommendations in December 2006.

Funding for new or expanded public transportation services is a concern. With the successful return of passenger rail service to Maine, and the success of the *Island Explorer* bus service on Mount Desert Island, many communities are interested in starting or expanding seasonal or year-round transit services. For new programs created by MaineDOT, the primary federal (FTA) support is limited to three years of operating assistance, leaving municipalities to cover the remaining cost with local dollars, or to discontinue service when the federal funding eligibility expires.

**Capital Costs for Public Transportation**

Maine relies heavily on FTA funds for transit vehicle replacement and purchase, and other operational investments in public transportation. The state occasionally receives additional federal capital funds on an allocation (money for specific projects) basis. State bond funds, as well as local funds, are often used to match these federal funds. Additional capital funds will be required to replace and build transit facilities, intermodal centers, bus garages, and other support facilities.

Capital funds are also needed to match federal programs to build infrastructure such as bicycle and pedestrian trails, auto ferry facilities, and bus, railroad, and airport projects. In many cases, the federal funding available is not sufficient to meet the public demand for these investments.

**Maintenance Costs for Public Transportation**

Currently, maintenance costs for airports, transit vehicles, trails, railroads, and ferry vessels are not adequately covered by federal or state funds. Without adequate funding, Maine will not able to physically maintain its capital investments, risking premature failure of these valuable assets, and more costly replacement. Also, it is increasingly problematic for Maine municipalities to find the standard 50% FTA funding match for operational transit expenditures, or the 20% match for capital transit expenditures.

**Operating Costs for Freight Railroads**

Freight rail operations are provided by private freight rail carriers and thus, operational funding for freight rail has not been required in recent years.

**Capital Costs for Freight Railroads**

Freight rail infrastructure in Maine is owned both by private freight railroad companies and by the state. In recent years, Maine has supported capital improvements on privately held rail lines through the state's Industrial Rail Access Program (IRAP), which provides matching grants to businesses who want to access freight rail service, or to improve their facilities to permit increased use of rail. The state has also assisted by providing funding support for capital improvements at intermodal freight facilities that transfer trucks to rail. These improvements have been funded both through state bond funds and through federal CMAQ funds. The state also provides rail-crossing safety improvements through the U.S.D.O.T.'s Section 130 Program.

Maine has also invested in the 300 miles of state-owned rail line, to maintain the rights-of-way for future rail use, and to rebuild rail lines for leased operation by private carriers, if and when those lines become economically feasible. Currently, about 96 miles of state-owned track are leased and active. The state will continue to pursue rehabilitation of these lines as the economics makes their operation viable. Capital funding for state-owned lines comes primarily from state bond funds.

**Maintenance Costs for Freight Railroads**

Maintenance activities on privately owned rail lines are performed by the private carriers. Maintenance on the state-owned lines that are active is performed by the rail operator that is leasing the line. The state *does* require funding for maintenance of state-owned lines that are *not* in active service. Such maintenance is currently funded through the State Transit, Aviation, and Rail (STAR) Account (see below), but the funding derived from this source is about half of what is needed to adequately maintain these rail corridors in acceptable condition.

**Operating Costs for Marine Freight Transportation**

With most ocean cargo in Maine now carried by foreign or domestic private carriers, and most port operations also under private ownership, public operating funds have *not* been needed for marine freight operations in Maine in recent decades.

**Capital Costs for Marine Freight Transportation**

Maine's marine seaport infrastructure is held by the Maine Port Authority, the Eastport Port Authority, the city of Portland, and an assortment of private companies. The preferred instrument for new investments is the Maine Port Authority, in combination with public/private partnerships. However, some projects are very capital-intensive and require other state support, usually in the form of general obligation bonds or federal CMAQ funds.

For smaller marine infrastructure projects on the working waterfront, MaineDOT has successfully built more than 90 projects in coastal towns through the state's Small Harbor Improvement Program (SHIP). This program uses general obligation bonds and U.S. Fish and Wildlife Service Boating Infrastructure Grant (BIG) funding.

In addition, the U.S. Army Corps of Engineers provides valuable maintenance funding and new-construction funding for marine facilities in Maine's 125 coastal communities. These funds require non-federal matching funds for new facilities.

**Maintenance Costs for Marine Freight Transportation**

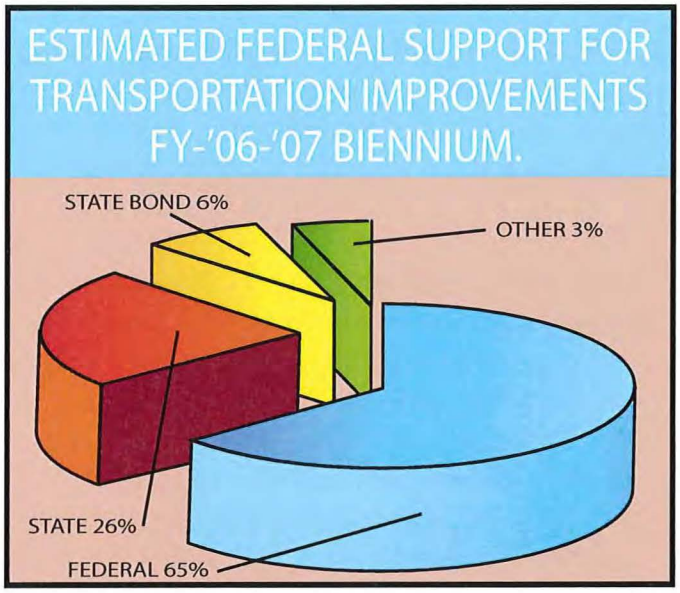
Maintenance costs for marine facilities are usually built into the long-term financial structure of construction projects. Private business, municipalities, and port authorities are required to agree to fund maintenance at a project's outset.


**The STAR Account**

In 2005, the Maine Legislature created the (in 2005 Public Law; Chapter 457; Section GGG) the State Transit, Aviation, and Rail (STAR) Account—a fund, for non-highway-and-bridge needs, which is separate from constitutionally protected motor fuels tax revenues. Revenue sources for the STAR Account are derived from the jet-fuel tax (currently .034 cents per gallon), the propane tax (currently .183 cents per gallon; indexed to inflation), and the railroad excise tax, which is derived annually from operating revenues. Funding from the account is presently being used to reimburse the city of Augusta for the Maine State Airport, to provide the local matching funds for public transportation projects, and to reimburse the state's Rail Preservation Account for maintenance activities on Maine's 300 miles of state-owned rail. The STAR Account can address only a fraction of the *non*-highway-and-bridge needs.

## The Federal Transportation Funding Outlook

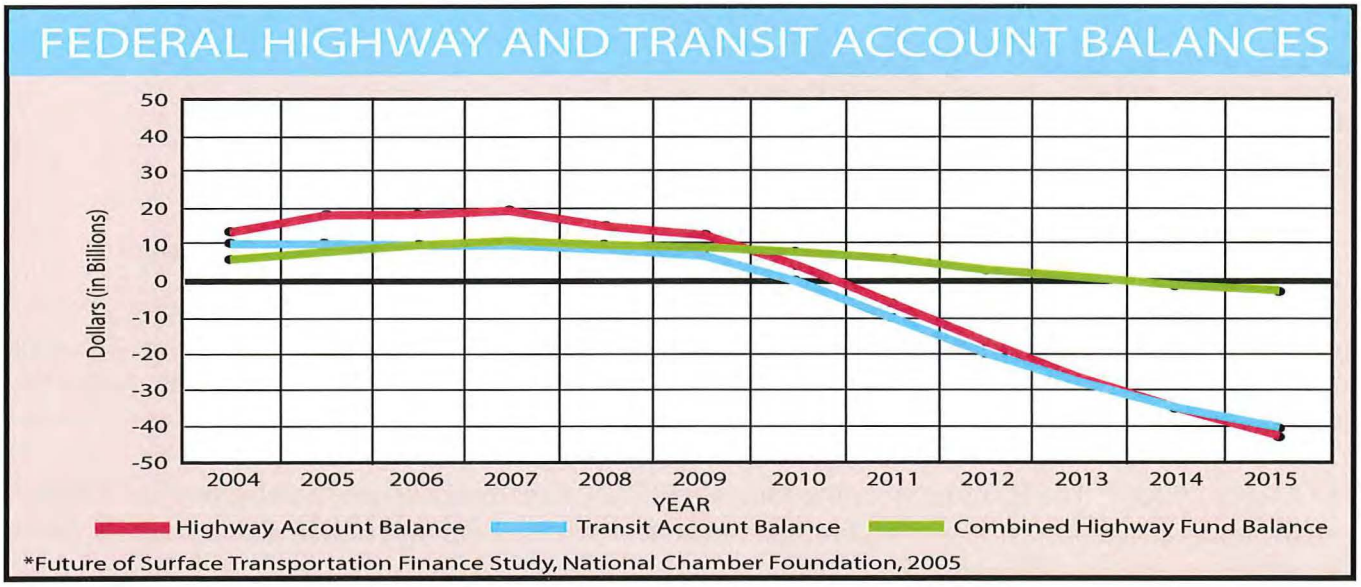
The sustainability of federal surface transportation funding is in question. A recent study commissioned by the U.S. Chamber of Commerce through the National Chamber Foundation entitled *"Future Highway and Public Transportation Finance Study,"* forecasts that the Highway Account of the federal Highway Trust Fund (HTF) could become insolvent as early as 2010. Likewise, the Transit Account of the Trust Fund is projected to be in deficit by 2014. The study concludes that existing revenue streams into the Trust Fund leave significant annual shortfalls in meeting the federal "share" of capital investments necessary to maintain and improve the nation's highway and transit systems.




*"The Chamber has issued a warning about a potential shortfall between the funding levels Congress committed to in the highway and transit reauthorization legislation and available Highway Trust Fund revenues...Congress may well be called upon to act before the next reauthorization cycle in 2009 to be sure the Trust Fund can support the guaranteed funding levels."*

John Horsley, Executive Director;
American Association of State Highway
and Transportation Officials; November 3, 2005.

To stress the importance of a sustainable revenue stream, consider that approximately 84% of the federal funds Maine receives for capital transportation improvements are associated with the Federal-Aid Highway Program, which is supported by the Highway Trust Fund, and that 90% of the Highway Trust Fund revenue is derived from the federal tax on motor fuels.



## The Funding Challenge: A National Conversation

In response to concerns about the long-term viability of the Highway Trust Fund, Congress included several new policy and financing studies in "SAFETEA-LU," the new authorization for federal surface transportation programs through 2009. The law creates:

- *The National Surface Transportation Infrastructure Financing Commission* – A 15-member commission established to study highway and transit funding, consider alternative revenue approaches, and develop recommendations within two years of its first meeting.
- *The National Surface Transportation Policy and Revenue Study Commission* – A 12-member commission to study the current condition of the surface transportation system, identify future needs, and develop financing recommendations no later than July 2007.

The National Conference of State Legislatures (NCSL) has also initiated the *Transportation Funding Partnership Project* to examine long-term financing issues and potential funding solutions. This is a project between NCSL, its Foundation for State Legislatures, and other interested parties. The project involves legislators, legislative staff, transportation organizations, and private sector interests. A report on the project findings will be released in 2006.

Also, the American Association of State Highway and Transportation Officials (AASHTO) has created a number of "policy teams" to develop policy recommendations for the two National Surface Transportation Commissions established by SAFETEA-LU. MaineDOT Commissioner David Cole serves on the Transportation Policy Futures Committee (TPFC), Deputy Commissioner Gregory Nadeau has been appointed to the Working Group on Surface Transportation Funding and Finance, and Deputy Commissioner Bruce A. Van Note has been appointed to the Working Group on Future Federal Programs: Roles, Responsibilities and Program Structure. These policy subgroups report to the TPFC

*"The efficiency of Maine's transportation system, particularly its highways, is critical to the health of the state's economy. Businesses are increasingly reliant on an efficient and reliable transportation system to move products and services. a key component in business efficiency and success is the level and ease of access to customers, markets, materials and workers."*

The Road Information Program (TRIP): October 2005; "Maine's Roads and Bridges: An Analysis of the Ability of Maine's Transportation System to Meet the State's Need for Safe and Efficient Mobility."

## Maine's Transportation Infrastructure, and Economic Opportunity

The importance of transportation to economic opportunity and productivity is widely accepted. Policymakers at the national, regional, state, and local levels are becoming more deeply involved in decisions relating to investment in transportation that are intended to contribute to increases in economic productivity and growth.

In October of 2005, The Road Information Program (TRIP), a national non-profit transportation research group, produced a report on Maine's transportation system and its ability to meet the state's need for safety and efficient mobility. The report notes that:

- 87 percent of the $32 billion worth of commodities delivered annually to and from sites in Maine is transported on the state's highways;
- commercial trucking in Maine is projected to increase 52 percent by 2020;
- increasingly, companies are looking at the quality of a region's transportation system when deciding where to relocate or expand; regions with congested or poorly maintained roads may see businesses relocate to areas with a smoother, more efficient transportation system;
- every $1.00 spent on street and highway improvements results in $5.40 in benefits in improved traffic safety, reduced travel delays, and reduced vehicle operating costs, according to the Federal Highway Administration; and
- businesses have responded to improved communications and greater competition by moving from a "push-style" distribution system, which relies on low-cost movement of bulk commodities and large-scale warehousing, to a "pull-style" distribution system, which relies on strategic and time-sensitive movement of goods.

*"Regular road and bridge maintenance and improvements are critical to Maine's future mobility, traffic safety and economic growth... Maine's economy literally rides on its highway system."*

Dana Connors; President,
Maine State Chamber s of Commerce

## Fiscal Resources vs. Long-Term Needs: The "Infrastructure Deficit"

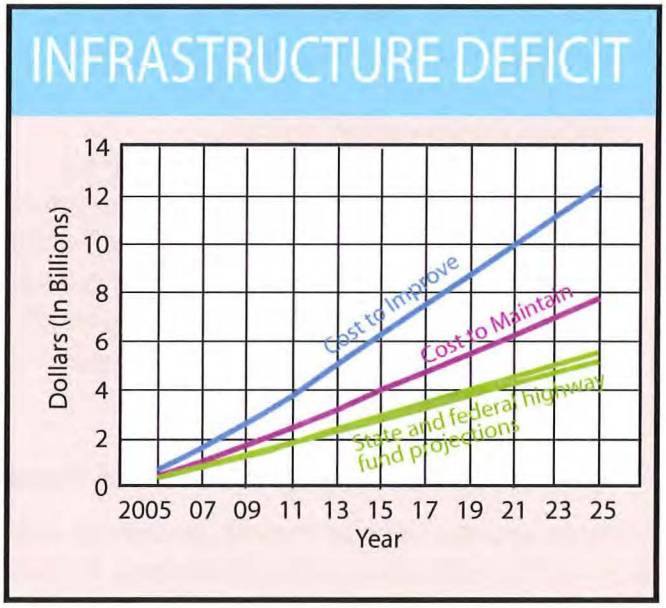
While Maine wrestles with the critical question of whether the motor fuels tax, the primary source of funding or transportation infrastructure improvements, is sustainable for the long term, the state is also dealing with n aging infrastructure that has growing demands placed upon it. Maine has over 4,000 miles of existing highways in need of reconstruction to bring them to modern structural, operational, and safety standards. 1,700 of hese miles are posted to weight restrictions during periods of spring thaw. Maine is also higher than the New England and national averages in its percentage of aging bridges. 40% of the more than 2,967 bridges (includes 21 "extraordinary bridges," 1,962 traditional bridges, 775 minor spans, and 209 low use or redundant bridges) under MaineDOT's jurisdiction are over 50 years old, which means they are nearing the end of their useful life. *Non*-highway-and-bridge transportation infrastructure (e.g., rail lines, airports, and buses) is also aging, and is contributing significantly to Maine's overall transportation need.

*"Transportation in Maine is a challenge for virtually every community, rural and urban. But reliable, affordable transportation is essential to economic vitality, in that it is a means by which workers get to their jobs, get their children to childcare, and shop for the family's needs."*

Maine Centers for Women, Work and Community;
"Maine Women's Economic Security Agenda".

In the last decade, vehicle-miles of travel in Maine have increased by 20% as a result of a number of factors, including increases in the number of registered motor vehicles and licensed drivers, and sprawling patterns of land development. Also, a growing economy, and requirement for "just-in-time delivery" of goods, has increased the percentage of goods transported by commercial vehicles traveling on Maine's highways from 65% in the early 1980s to 87% today. Increased congestion in some on Maine's urban and recreational areas also indicates a growing need for new and expanded capacity and transportation services.

*Current revenue provided by all levels of government—federal, state, and local—are not sufficient to maintain existing transportation infrastructure, let alone to invest in expansion or enhancements necessary to meet the growing demands on the system*




While the percentage of Maine state revenues expended on transportation infrastructure has decreased in recent decades, the long-term transportation needs in Maine are significant, and growing. The cost simply to maintain the current performance of the existing transportation system over the next 20 years is estimated to be approximately $8 billion. To advance new and expanded transportation infrastructure and programs, it is estimated that as much as an additional $12 billion will be required. Current revenues provided by all levels of government—federal, state, and local—are not sufficient to maintain existing transportation infrastructure, let alone to invest in expansion or enhancements necessary to meet the growing demands on the system.

**A Need to Invest Strategically**

It is essential for Maine to begin the process of identifying sustainable sources of funding to support investment in the state's transportation infrastructure, but it is also imperative that the funding currently available to MaineDOT and other transportation agencies be invested both efficiently and strategically. Thus, there is a need to continually look for opportunities to maximize the effectiveness and efficiency of the delivery of projects and programs, by establishing realistic goals and expectations, utilizing new technologies, and encouraging research and innovation. There is also a need to encourage and reward effective land use planning, not only to preserve Maine's quality of life, but also to optimize the efficiency of transportation investments. Investments in transportation infrastructure must, to the extent that is practical, leverage new resources, both public and private, particularly in areas where there is a demonstrated regional or statewide economic benefit. Succinctly stated, Maine needs to invest wisely, and regionally.

**Corridors of Regional and Economic Significance**

In 2005, MaineDOT commissioned the state's regional Economic Development Districts (EDDs) to engage in a public process to identify opportunities where transportation investments could support regional economic development goals. As a result of this effort, each of Maine's EDDs produced a Regional Transportation Assessment that identified priority corridors within its respective region, and identified specific opportunities where transportation investment might support regional land use and economic development goals and initiatives. These corridors will be referred to as "Corridors of Regional and Economic Significance," and the recommendations set forth will guide decision-makers in prioritizing the strategic investment of scarce transportation funding. These corridors could also play an important role in helping federal transportation officials and Maine's Congressional delegation as they consider future requests for allocations of federal funding for transportation.

## Alternative Funding Options

In developing a response to the Legislature's 2004 directive, MaineDOT commissioned the Margaret Chase Smith Policy Center (MCSPC) at the University of Maine at Orono to conduct research on the viability of the motor fuels tax for funding long-term transportation needs, and to explore alternative financing options that might have the potential to supplement or replace Maine's motor fuels tax. The MTA also provided significant research with respect to tolling options and has identified ways the MTA could play a greater role in the overall solution to Maine's long-term transportation funding needs. Their research is attached to this report.

**Margaret Chase Smith Policy Center Research**

The MCSPC study acknowledges erosion in the motor fuels tax as a means for funding transportation infrastructure needs in Maine, and explores alternative financing strategies that may or may not have the potential to supplement that tax. A summary of the benefits and issues relative to each of the alternative financing options identified is attached to this report as an attachment. The study identifies 16 financing options, their benefits, and corresponding concerns. These options fall under four broad categories—*taxes, direct pricing, tolls, and fees.*

Of the 16 funding options identified, several are probably not applicable to Maine due to the rural nature of our state. Several others appear to merit further consideration, including:

**Mileage-Based Fees: The "Oregon Experiment"**

The MCSPC report explores an ongoing research project in the state of Oregon, which uses mileage-based charges to replace the motor fuels tax, as one of the more promising future alternatives for funding transportation. The report indicates that a 1.74 cent-per-mile fee would be needed to maintain the current revenue levels generated by motor fuels taxes. Issues of concern with this option include privacy, compliance, and equity between urban and rural travelers. Conceptually, mileage-based fees present a stable revenue source that is determined by the number of miles a person drives. Mileage-based fees could be implemented gradually, and the technology is currently available to implement and monitor such a system. The state of Oregon began its mileage-based fee pilot program in 2005, initially involving 20 vehicles, and expanding to approximately 200 vehicles in 2006. Oregon appears to have addressed many of the initial concerns and expects to publish results from the pilot by 2007.

**Value Pricing /Managed Lanes**
"Value pricing" or "managed lanes" systems allow motorists to buy their way out of traffic by placing a value on their time. Value pricing is primarily practicable on urban highway systems where multiple lanes exist. Congestion is managed by designating specific lanes for high-occupancy vehicles (HOV lanes), on either a toll-free or variable-toll basis. While value pricing would not likely become a major finance alternative in Maine in the near future, it could serve as a supplemental finance mechanism.

**Distance-Based (Vehicle) Fees/Price Variability**
Under a system of distance-based vehicle fees, the current fixed price of owning a vehicle would be replaced with a variable price—such as variable registration, insurance, and/or title fees—based on vehicle-miles traveled. Under this model, motorists can control their own costs by adjusting their driving habits.

The MCSPC report concludes that whatever options are considered, equity, suitability and acceptability criteria will need to be evaluated.

In addition to the research conducted by the MCSPC, MaineDOT and the MTA have identified other funding alternatives that deserve consideration.

**State Partnerships with Public, Quasi-Public, and Private Entities**
There are several ways by which transportation agencies can leverage investments in, and share responsibility for, transportation infrastructure projects. Two of the more likely options are partnerships between state and local governments (State and Local, or "Public/Public" Partnerships) and partnerships between the state and private entities (Public/Private Partnerships).

**"Public/Public" and "Public/Quasi-Public" Partnerships**
For a number of years, MaineDOT has encouraged local partnerships through "matching" funding arrangements for certain infrastructure improvements. Highway improvement projects within the state's urban areas have required a local cost share. Public/Public partnerships also include programs such as the:

- **Rural Road Initiative (RRI)** program, created in 1999 to address the capital improvement needs of Maine's 2,100+ miles of rural "State-Aid minor collector" highways; the RRI Program provides partial funding (67% state share and 33% local share) and incentives for municipalities to partner in capital improvements on State-Aid minor collector roads; the local share can come from any municipal funding source, including Urban-Rural Initiative Program (URIP) funds; the
- **Small Harbor Improvement Program (SHIP),** which promotes public access and economic development by preserving infrastructure along the coast; SHIP also helps municipalities make improvements (to public wharves, landings, and boat ramps) that might otherwise not be possible due to their considerable costs; a local match of up to 50% of the total project is required; the
- **Community Gateways Program,** which assists Maine communities in enhancing transportation corridors and community landscapes; the program encourages citizen and community involvement in community livability initiatives; MaineDOT financially supports projects that apply innovative and effective efforts towards the creation and maintenance of community gateways near highways or other transportation facilities; eligible projects include landscaping, visual access, public space improvement, and streetscape improvements; the

- **511 Travel Information -** MaineDOT is a member of a 14-state consortium that is sharing the cost to design and develop the 511 Travel Information System. Maine's 511 Travel Information is available to help commuters and travelers access information regarding weather-related road conditions, construction, and congestion, via the Internet or by phone, 24 hours a day and seven days a week; Alaska, Idaho, Indiana, Iowa, Kentucky, Louisiana, Minnesota, Missouri, New Hampshire, New Mexico, Rhode Island, Vermont, and Wyoming are also members of this consortium, which provides its services to the public, free of charge; and the
- **Maine Turnpike Authority** (a "quasi-public" agency) partnerships on the Gray Bypass, the Lewiston/Auburn Downtown Connector Study, and joint development of truck rest-areas (MaineDOT and the MTA will continue to explore a broad range of partnership opportunities.)

**"Public/Private" Partnerships**

The structure of Public/Private Partnerships may involve varying degrees of involvement with private companies. These partnerships range from the "Design-Bid-Build" method of project delivery—where the public sector retains a high level of the responsibility for finance, operation, and maintenance of the project—to much deeper levels of *private* involvement. At the far end of the spectrum is a "Build-Own-Operate" arrangement, in which the private sector would develop, finance, design, build, own, operate, and maintain a transportation facility. Between these two extremes, there are many different potential levels of partnership and responsibility.

To date, MaineDOT has initiated a few such public/private partnerships, specifically by using the Design-Build method of project delivery on the Sagadahoc Bridge (Bath), the I-295/Commercial Street Connector (Portland), and the Penobscot Narrows Bridge and Observatory (the Waldo-Hancock Bridge Replacement Project, now under construction.) In addition, MaineDOT has partnered through:

- the Industrial Rail Access Program (IRAP), which supports industrial development by providing 50% of funding for industrial rail upgrades; to date, IRAP has invested $3.82 million in state funds, and leveraged over $3.82 million in private and local funds to support 21 rail access projects in 17 Maine communities; with
- Concord Trailways to develop the with Portland Transportation Center;
- Acadia National Park, LL Bean, and local communities and businesses to support the *Island Explorer* bus service on Mount Desert Island; with
- the Bethel Chamber of Commerce, Sunday River Ski Area, and area businesses to support the *Mountain Explorer* bus service; with
- Sprague Energy and the Maine Port Authority on development of Mack Point at the Port of Sears port; and with
- three private and one public trolley services, and the municipalities of York, Wells, Kennebunkport, and Ogunquit to provide the *Shoreline Explorer* trolley service.

**Tolling: Time-Tested Solution for a New Age**

The Maine Turnpike Authority contributed significantly to this report, most prominently in development of the appended analysis of tolling innovations in Maine and across the country, and by partnering with MaineDOT to conduct last year's regional transportation forums.

In its report, the MTA report reviews Public/Private Partnerships (PPPs), noting that, *"...the earliest and most efficient example of PPPs are the independent toll authorities such as the Maine Turnpike Authority.*

*These are seen as more efficient because the rate of needed repayment is only what is necessary without the need for profit...."* Indeed, Maine is fortunate to be one of the states with a tolling agency already in place. Toll-collection systems and technologies have been in place in Maine since the creation of the Maine Turnpike Authority in 1941. The MTA has decades of experience and a proven record of success at sustaining and improving a major highway system with toll revenues. The MTA also recently launched E-ZPass, a state-of-the-art electronic toll-collection (ETC) system. The E-ZPass system is now in use in 11 states, from Maine to Virginia.

The MTA report also reviews a number of tolling options, such as High Occupancy Toll (HOT Lanes), Truck-Only Toll lanes, and Fast and Sensible Toll (FAST) lanes. Some of these options may not be readily applicable in rural states like Maine, since they require new infrastructure including lane separations, and highway segments with at least three lanes (so that one can be used for travel, one for passing, and one dedicated to a specific purpose.)

**MaineDOT and the Maine Turnpike Authority: Expanding the Partnership**

MaineDOT and the MTA have worked together effectively for over 50 years to foster a partnership—one in which the Turnpike is recognized as a vital component of Maine's statewide transportation system. In January 1997, MaineDOT and the MTA commissioned a "Statewide Transportation Partnering Study," which examined ways by which the two agencies might work together, even more closely, to finance transportation infrastructure improvements in Maine. The study identified several ways that MaineDOT and the MTA can work together to increase the amount of bonded debt that can be leveraged for infrastructure and maintenance improvements. Options include:

- generation of new revenues through expanded use of tolling on the state's transportation system, collected by the MTA for use by MaineDOT to support capital needs; and
- issuance of "Conduit Revenue Bonds" by the MTA supported by new or expanded toll revenues or other new sources of funds.

Current federal law now imposes some limitations on the establishment of tolls on existing Federal-Aid Highways. Innovative financing techniques and broadened flexibility in the use of federal funds, as provided for in SAFETEA-LU, may enable new models for financial cooperation between MaineDOT and the MTA that should also be explored. Such "Public/Quasi-Public" partnerships may prove to be excellent supplemental sources of capital for financing transportation infrastructure improvements. The new provisions in SAFETEA-LU include:

- three pilot projects to collect tolls for *construction* on the Interstate Highway system;
- three pilot projects to collect tolls for *reconstruction/rehabilitation* on the Interstate Highway system;
- $59 million for up to 15 variable-pricing pilot programs to manage congestion; and
- 15 Express Lane demonstration projects, for tolling to manage congestion.

**Debt Policy**

The MTA report also examines debt-financing options for transportation infrastructure, including the ongoing efforts to address a $130 million shortfall in the MaineDOT Biennial Capital Work Plan for Fiscal Years 2006-2007.

On January 31, 2006, the Governor's Capital Transportation Funding Working Group submitted a report assessing the impacts of the FY 2006-2007 Biennial Capital Work Plan project deferrals, and recommendations as to how to mitigate these impacts. The Working Group recommendations include debt-financing components that seek to address the short-term funding deficiencies. However, the MTA report produced findings and recommendations that may also be applicable to Maine's long-term funding challenges. In particular, various bonding instruments appear to hold promise for addressing long-term transportation infrastructure needs.


As stated in the Working Group report, Maine has been conservative in its levels of borrowing to finance long-term transportation improvement projects. Given Maine's currently favorable position in the financial marketplace, the state and the MTA could improve economic opportunities by leveraging available capital—funding long-term transportation infrastructure needs by spreading the cost of improvements over a portion of a project's lifespan.

The MTA recommends consideration of use of federally enabled "Grant Anticipation Revenue Vehicles (GARVEEs)," and/or of new "Conduit Issued Revenue Bonds." Maine is familiar with GARVEE financing, having used it previously to finance part of the Waldo/Hancock Bridge Replacement Project. GARVEEs are secured by future receipt of federal transportation funding. Conduit Revenue Bonds could be used, through "conduit issuers" such as the MTA or the Maine Municipal Bond Bank, for non-toll bond programs, to support the state's capital transportation investments. Conduit Issued Revenue Bonds also provide flexibility and predictability in planning long-term transportation investments. The essential element to providing predictability would be to identify a source of revenue that could be dedicated to service bond debt. Either debt instrument would likely require longer maturity terms of 15 to 25 years to avoid short-term cash-flow problems, and to better reflect capital asset lifespans of 50+ years. In its assessment for the Working Group Report, the MTA states that, *"any new GARVEEs that extended their final term to 15 to 25 years would likely carry a mid- to low-'A' category rating. Conduit Issued Revenue Bonds would likely carry a mid- to high-'A' rating, which would result in marginally lower issuance cost than the GARVEE Bonds."*

While the issuance of either financial instrument would mean assuming long-term debt, such costs should be measured against Maine's ability to meet long-term transportation infrastructure needs, the potential for lost economic opportunities, and inflationary pressures that could increase the costs of delayed proj

ects. These forms of debt could be structured so as *not* to pledge the full faith and credit of the state, while still receiving favorable interest rates in the financial markets.

## Educating and Gathering Input from the Public

Together, MaineDOT and the Maine Turnpike Authority (MTA) have led a number of efforts to promote discussion and seek input on future funding needs and challenges. MaineDOT and the MTA conducted internal workshops with planners and top economists from Maine and throughout New England with expertise in disciplines relevant to transportation and the economy. The two agencies also conducted eight statewide focus group sessions and seven statewide forums. In addition, the MTA surveyed hundreds of citizens on transportation and transportation funding issues.

While outreach efforts indicate that the public believes that the motor fuels tax will remain the primary source of funding for highway and bridge needs, the MTA survey found that the public views tolling as the 'fairest' way to raise revenue for those needs. Given that many aspects of the statewide highway system may not be well-suited to tolling, (rural road systems, for example) these results indicate strong support for both methods.

In 2004, focus group participants in eight different sessions across the state were asked what would be the best mix of revenue options to fund MaineDOT's needs if they were making policy on this issue. The aggregate response of the focus groups was that:

- 45% should come from a state motor fuels tax;
- 13% should come from bonds;
- 23% should come from vehicle licenses and fees;
- 8% should come from tolls;
- 4% should come from other taxes; and
- 6% should come from various other sources.

Approximately 300 stakeholders attended the series of seven regional forums in 2005 to discuss regional transportation needs and funding issues. At each forum, a portion of the agenda was dedicated to discussion of transportation funding. MaineDOT captured comments and suggestions from each of these discussions in the various regions of the state. The primary findings from the forum breakout sessions on transportation funding included:

- broad consensus that the sustainability of Maine's motor fuels tax is a problem that needs to be addressed, and that MaineDOT should be more proactive in educating the public about these problems and should seek funding alternatives;
- broad consensus that the motor fuels tax will remain the foundation of transportation finance;
- broad consensus that MaineDOT should seek additional funding to implement strategic transportation improvements that will support regional and statewide economic opportunity;
- general support for several revenue-raising options, including public/private partnerships, use of the General Fund, and a portion of the tax on meals and lodging *if the revenue is dedicated for Highway Fund use only;*
- general support for further consideration of a mileage-based fee (in lieu of a motor fuels tax) by which motorists would be charged for the number of miles they drive; and
- general interest in further discussions about tolling, particularly with respect to certain projects that add new capacity to the transportation system.

In 2005, the Potholm Group conducted a survey of 500 Maine residents. The survey results indicated:

- support for improving highways and funding those improvements with tolls is at least as strong in Maine as it is in the nation; that
- 45% of Maine citizens are prepared for bold new steps to change the way the state funds transportation (only 13% said they were not prepared, and 42% were undecided); that
- by a margin of 45% to 29%, respondents support the idea of the Maine Turnpike Authority taking over and tolling parts of the aging Interstate Highway System, and using the revenues to pay for repairs and improvements to those sections (25% were undecided); that
- when asked to choose which method of funding was the fairest of the four primary transportation revenue sources, 49% chose tolls, 16% chose the motor fuels tax, 10% chose bonds, and 3% chose general tax revenue; that
- tolls rated extremely high in terms of fairness (fully 82% of those surveyed said that tolls are fair, compared with 14% who found them unfair; by comparison, 50% of those surveyed found the motor fuels tax to be fair, while 43% found it to be unfair); and that
- 69% of those polled agreed that *electronic* toll collection makes tolls a more attractive option to pay for highway and bridge improvements. (only 9% disagreed)

* * * * *

This report has presented a discussion of the future of transportation funding in Maine, it stresses the importance of new and expanded transportation infrastructure for Maine's current and future economic opportunities, and identifies financing options to consider in closing the "Infrastructure Deficit" between needs and revenue. What options might be most viable for Maine is a question best answered by the Maine Legislature. MaineDOT and the Maine Turnpike Authority stand ready to assist the Legislature by providing resources and support as these difficult questions are considered.

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## Acknowledgements

MaineDOT and the Maine Turnpike Authority would like to express appreciation to Maine's Economic Development Districts and their associated Regional Planning Organizations for their support of MaineDOT's long-range transportation planning efforts—specifically, for their assistance in public outreach, for development of regional transportation needs assessments, and for their direct involvement in the seven regional transportation forums held in 2005. The results of these efforts contributed to this report and will help guide transportation investments in the future.

# Attachment A

## Sustainable Transportation Funding for Maine's Future

# Sustainable Transportation Funding for Maine's Future

January 20, 2006

*Prepared for*: Maine Department of Transportation
*In Response to*: Transportation Research Problem and Statement:
Phase 2- Alternative Transportation Funding

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## TABLE OF CONTENTS

## LIST OF TABLES

## LIST OF FIGURES

## LIST OF CASE STUDIES

## LIST OF ACRONYMS

| *Acronym* | *Definition* |
|---|---|
| AASHTO | American Association of State Highway and Transportation Officials |
| AEO | Annual Energy Outlook |
| AMFA | Alternative Motor Fuels Act of 1988 |
| BTS | Bureau of Transportation Statistics |
| CAFE | Corporate Average Fuel Economy Standards |
| IEA | International Energy Agency |
| NASHTU | National Association of State Highway and Transportation Unions |
| NCHRP | National Cooperative Highway Research Program |
| NHTSA | National Highway Transportation Safety Administration |

## Executive Summary

Maine is dependant on its transportation infrastructure for continued economic strength and growth, particularly on the 22,670 miles of public roads.[1] Maine ranks fourteenth in the nation for the largest number of highway miles traveled annually per capita - 14,912 per year. Maine is highly reliant on its road system because large areas of the State lack transportation alternatives. This means that the current and future condition of the roadways is a major concern. How such a crucial infrastructure will continue to be supported and enhanced financially to meet the growing needs of the State must be considered carefully.

In the United States, the primary source of funding for transportation at the state level is a motor fuel excise tax. In 2004, the fuels tax in Maine was 8% of the State's total revenue and 68% of the Highway Fund revenue. Of particular concern for the State is the erosion of motor fuel excise taxes as a primary basis for funding Maine's public road infrastructure.

Transportation policy makers have identified a number of threats to fuel tax revenue including: tighter fuel economy standards, a possible increase in the market share for alternative fuel and hybrid vehicles, the declining purchase power of motor fuel tax revenue, and increasing demands on the transportation infrastructure coupled with increasing costs of materials for transportation projects.

Maine is not alone in relying on the motor fuel taxes and in facing threats to this revenue stream. A large body of research exists which examines alternatives for funding and maintaining transportation infrastructure. This report utilizes an extensive literature

[1] Sixty one percent of Maine's roads are owned by town or municipal governments while 37% are owned by the State.

review to identify twelve financing options, many of which are simultaneously aimed at generating revenue and addressing other transportation issues such as congestion. The report also presents case studies from around the nation. To assist in presentation, four categories of alternative funding options are used throughout the report: taxes, road/direct pricing, tolls and fees. The findings of the literature review are summarized in Table ES.1.

This report also recognizes that increasingly, transportation planning must consider not only traditional issues of best practice, financing and safety, but also issues of equity and suitability. As the number of transportation initiatives grows, along with alternatives to finance them, more attention must be devoted to determining the suitability of an option for a State's specific needs. An additional important consideration in transportation decisions and investments is the subsequent effect on diverse economic groups. Such assessments of equity and suitability should be considered as Maine looks ahead in transportation planning.

Other states have begun to tackle some of these same issues and have employed a set of evaluation criteria as a means of identifying preferred options for funding transportation infrastructure. The list of financing options presented in Table ES.1, however, demonstrates that many of the alternatives were designed for major metropolitan areas and may not be suitable for Maine. This report provides a combination of suitability and equity considerations as helpful tools for evaluating the applicability of alternative financing options for Maine. The criteria outlined in Table ES.2 are intended to serve as a discussion point for policy makers.

While the primary focus of this report is the identification of financing options that *public* entities could employ for roadway financing, the report also investigates *public-private* partnerships as a financing option. Three successful, Maine, public-private partnerships (the Portland Transportation Center, Island Explorer and Maine 511 System) are included as case studies in the report. Beyond the experience in Maine, the report also discusses six possible levels of partnerships identified by the Federal Highway Administration. The report finds that the primary benefits of such partnerships include the ability to complete a greater number of projects at a faster rate as well as the potential to decrease the cost of new projects. The concerns surrounding public-private partnerships include the ability of public-private partnerships to meet the needs of the public transportation sector, issues of public safety (i.e., whether private contractors will meet the rigorous safety requirements of state and federal governments) and the assignment of risk among the partners, particularly operating revenue risk.

The report briefly describes the growing prevalence of multi-modal transportation projects as a response, in part, to the threats facing highway infrastructure funding. It is important to note that one of the largest challenges facing multimodal and intermodal project planning is that responsibilities for different modes are often held by different state agencies. Successful implementation of multi-modal and intermodal projects requires extensive communication among the relevant state agencies as well as the public.

The report includes a discussion of the important role of national transportation policies on Maine's future fuel tax revenues. Specifically, Maine transportation planners must continue to monitor the impacts of the Alternative Motor Fuels Act (AMFA) and

changes in the CAFE standards and other policies that intentionally increase fuel efficiency and decrease the use of petroleum, but also, inadvertently, decrease highway infrastructure revenues.

The data analysis component of the report utilizes Maine vehicle registration data, as well as national data sources, to generate fuel consumption and motor fuel excise tax revenue projections for Maine's entire vehicle fleet, including both gasoline and diesel vehicles. Current trends in fuel economy show only modest increases in fuel economy due to the phasing in of higher CAFE standards for light-duty trucks (Figure ES.1). These modest increases in fuel economy will likely yield a constant, or slightly decreasing, nominal value of future gasoline revenues for Maine. Actual changes in future fuel tax revenues also will depend on changes in the number of miles driven per capita and changes in Maine's population, both in size and in demographics. We examine the potential revenue impacts of these modest increases in fuel economy over a twenty-year period (i.e., to 2025). This scenario is entitled 'status quo' throughout the projections.

To examine the potential revenue impacts of larger changes, we project possible 5%, 15% and 30% increases in fuel economy for Maine's vehicle fleet over a ten-year period (i.e., to 2015).[2] A graph of fuel efficiency trends for both the nation and Maine (see Figure ES.1) shows that Maine closely mirrors national fleet fuel efficiency trends. These projections are then used to calculate the impact of changing fuel economy on

[2] The 30% increase was selected based on work by the National Research Council which indicates that existing and emerging technologies could be used to increase the fuel economy of new vehicles by about 30% by 2015. At the same time, given choice, consumers might choose to purchase greater acceleration, towing capacity, or other vehicle features that work against increased fuel economy. Efforts to project revenue changes further into the future face the limitation of either assuming constant technology or assuming development of new technology and therefore face unknown increases in fuel economy as a result.

Maine's motor fuel excise tax revenue stream through 2015 (Figure ES. 2). It is clear from these revenue projections that concerns of decreasing fuel tax revenue due to changes in fuel economy are well founded. If steps are taken at the national level to increase fuel efficiency standards, or consumers on their own choose to purchase more fuel efficient vehicles, Maine could experience a decrease in revenue of up to 10% in the next ten years. However, absent changes in national transportation energy policy or changes in consumer behavior, these increases in fuel efficiency may not occur. The revenue estimate under status quo assumptions is $214 million for 2015, representing a 2.53 % decrease in revenues. Extending the status quo projection to 2025 yields a revenue projection of $209 million for 2025, representing a modest 5.03% decrease in revenue from 2005. However, to the extent that the costs of highway maintenance and construction rise above the overall rate of inflation, actual purchasing power could be lower still.

The literature review section of this report discusses possible alternatives to supplement or replace the revenue obtained from fuel taxes. One financing option identified in the literature review, and currently employed both nationally and internationally, is a mileage-based charge. The report calculates that a mileage-based charge of 1.74 cents per mile would be required in order to maintain the current level of revenue of $220 million from the gasoline tax.

Determining the alternative funding options most appropriate for Maine is properly left for the State Legislature, the Governor and appropriate State agencies and the public. However, it is evident that many of the alternatives discussed in the literature review may not be preferred given Maine's economic and geographic circumstances.

The literature review and suggested evaluation criteria provide stakeholders much of the information necessary for informed discussions on the future of Maine's transportation financing.

Table ES.1 Literature Review Findings

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| *2.2* | | | ***Taxes*** | |
| 2.2.1 | Alternative Gas Tax Structure | Indexing gas tax rates to a measure of inflation. | 1) Avoid politically charged situation of increasing tax rate<br>2) Maine currently uses an alternative gas tax structure | 1) Gasoline taxes are regressive (shift tax burden to the poor & middle class) |
| 2.2.2 | Local Option Transportation Taxes | Implementation of a tax at the local level. Earmark revenue for transportation. | | |
| | *Fuel Tax* | Percentage tax on gasoline sales. Revenue earmarked for transportation. | 1) Easily administered by local officials and local control of revenue<br>2) Local drivers are the source of revenue | 1) Jeopardize competitiveness of local businesses<br>2) Limited tax base therefore high rate would be required to raise revenue<br>3) Possible revenue decline over time given increasing fuel economy |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| | *Sales Tax* | Implementation of a sales tax at local or state level. Earmark revenue for transportation. | 1) Broad tax base<br>2) High revenue for low marginal tax rate; less objectionable to consumers<br>3) Complies with horizontal equity (all transportation users pay)<br>4) Direct voter involvement in implementing and maintaining tax<br>5) Revenue obtained from non-residents | 1) Possible revenue instability during recessions<br>2) No incentives for decreasing use of the transportation infrastructure<br>3) Possibly jeopardize competitiveness of Maine businesses |
| | *Other: Natural Resource Extraction* | Levy weight-based charge on natural resource extraction. | 1) Finance rural roads used only by natural resource industries | 1) Jeopardize competitiveness of resource based businesses<br>2) Roads often privately owned by natural resource industries. |
| | *Other: Payroll Tax* | Levy tax on businesses to finance transit. | 1) Finance urban transit systems | 2) Possibly inappropriate for Maine's rural makeup |
| 2.2.3 | Taxation of Alternative Fuels | Levy tax on alternative fuels such as natural gas. | 1) Maine currently taxes alternative fuels | 1) Limited market penetration of alternative fuel vehicles |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| *2.3* | | | ***Road/Direct Pricing*** | |
| 2.3.1 | Area Charging/ Cordon | Implement charge for operating vehicle in specified area. | 1) Promote efficient transportation behavior (carpooling, mass transit)<br>2) Consistent with other policy objectives (reduction of pollution, road wear, noise, etc.)<br>3) Large revenue base if implemented in large area | 1) Possible encouragement of sprawl<br>2) Creation of boundary effects; motorists increase travel in order to avoid charge |
| 2.3.2 | Congestion Pricing | Implementation of variable prices dependant upon time of travel and level of congestion. | 1) Reduction in congestion<br>2) Promote efficient transportation behavior (carpooling, mass transit) | 1) Possible public opposition to fee implementation at previously free area |
| 2.3.3 | Distance Based Charges | Implement variable vehicle user fee dependant upon distance traveled (i.e. per-mile charge). | 1) Stable revenue, not affected by fuel economy<br>2) Promote efficient transportation behavior (carpooling, mass transit)<br>3) Gradual implementation possible; lower public resistance | 1) Implementation of viable technology on a wide scale<br>2) Invasion of motorist privacy<br>3) Evasion of tax<br>4) Possible shifting of burden to rural areas<br>5) Capturing revenue from out of state travelers |

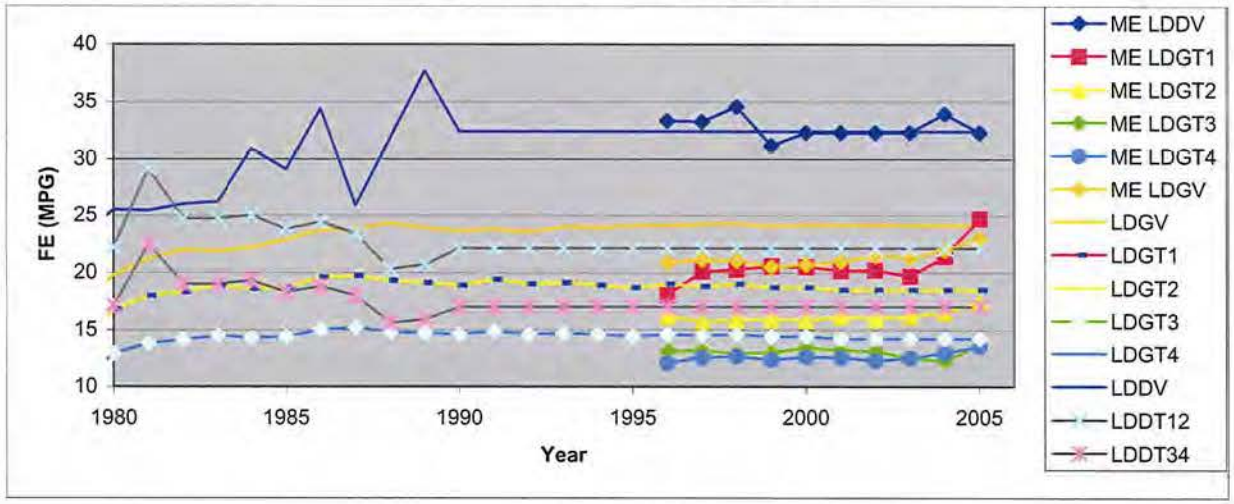
| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| 2.3.4 | Managed Lanes/ Value Pricing | Vary price of lanes dependant upon time of day and level of congestion. | 1) Present options to motorists; allow motorist to value own time<br>2) Congestion Management | 1) Decrease amount of infrastructure available to the general public |
| 2.3.5 | Value Capture | Require private developers to pay for maintenance of roads created. | 1) Local and State agencies no longer fiscally responsible for privately created roads | 1) Public safety (will developers maintain road consistent with standards of public agencies). |
| ***2.4*** | | | ***Tolls*** | |
| 2.4.1 | Facility Congestion Tolls | Implementation of variable user fees at specific facilities (ex: bridge), dependant upon congestion level. | 1) Promote efficient transportation behavior (carpooling, mass transit)<br>2) Reduce congestion | 1) Equity – fees may be used to finance projects not related to the tolled facility.<br>2) Tolls are regressive (shift payment burden to the poor & middle class) |
| 2.4.2 | Weight-Distance Tolls/Tax | Heavy goods vehicles must pay facility toll or per mile rate based on weight. | 1) Heavy goods vehicles pay commensurate with amount of damage inflicted on roads.<br>2) Captures value of roadways as 'warehouses' for commercial goods | 1) Possible jeopardy to Maine's trucking reliant industries |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| *2.5* | | | ***Fees*** | |
| 2.5.1 | Distance Based Fees/ Price Variability | Replace currently fixed price of vehicle ownership with variable price (ex: variable registration fee based on vehicle miles traveled). | 1) Motorists able to control own savings/costs by adjusting driving habits<br>2) Consistent with other policy objectives (reduction of pollution, road wear, etc.) | 1) Evasion |
| 2.5.2 | Emissions Fees | Levy variable user fees dependant upon vehicle energy efficiency and environmental emissions. | 1) Consistent with other policy objectives (reduction of pollution)<br>2) Promote citizen awareness of vehicle emissions | 1) Availability of information on emissions of all vehicles makes/models. |

Table ES.2 Sample Evaluation Criteria for Financing Options

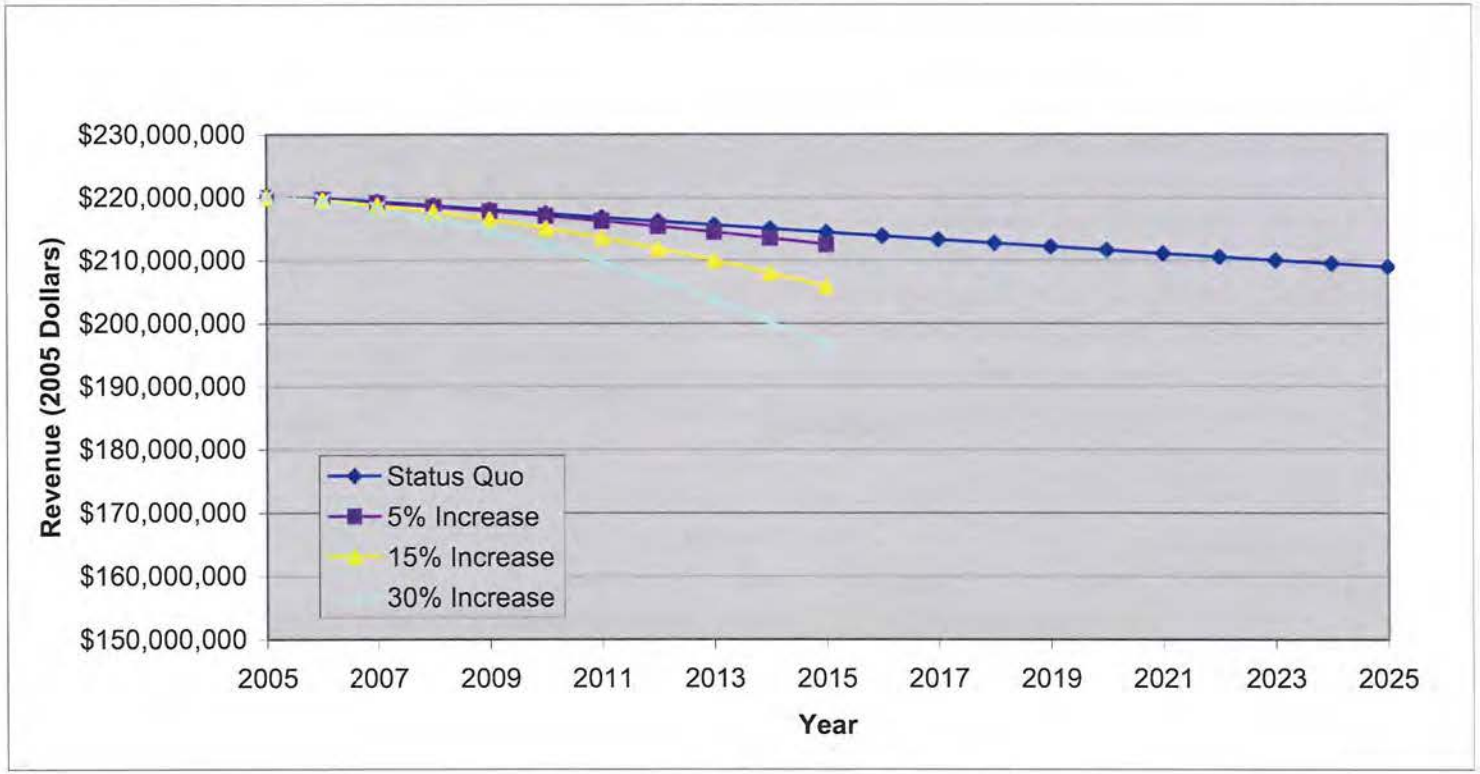
| | |
|---|---|
| 1 | What is the revenue raising potential of this option? |
| 2 | Will this option meet equity standards (do people with equal ability to pay, pay equally?) |
| 3 | Will this project meet pay-as-you-use standards (i.e. will those who use the system more, pay more)? |
| 4 | Will citizens still be able to use the roadways/transportation mode under this option, even if they have limited financial resources? |
| 5 | Will this option be enforceable and able to capture out of state travelers? |
| 6 | Is this option in alignment with other policy objectives? |
| 7 | Is this option politically feasible? |

Figure ES.1 Fuel Efficiency Trends




| ***Abbreviation*** | ***Description*** |
|---|---|
| ME LDDV | Maine Fleet of below |
| ME LDGT1 | Maine Fleet of below |
| ME LDGT2 | Maine Fleet of below |
| ME LDGT3 | Maine Fleet of below |
| ME LDGT4 | Maine Fleet of below |
| ME LDGV | Maine Fleet of below |
| LDGV | Light-duty Gasoline Vehicles (Passenger Cars) |
| LDGT1 | Light-duty Gasoline Trucks 1 (0-6,000 lbs. GVWR; 0-3,750 lbs. LVW) |
| LDGT2 | Light-duty Gasoline Trucks 2 (0-6,000 lbs. GVWR; 3,751-5,750 lbs. LVW) |
| LDGT3 | Light-duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR; 0-5,750 lbs. ALVW) |
| LDGT4 | Light-duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR; 5,751+ lbs. ALVW) |
| LDDV | Light-duty Diesel Vehicles (Passenger Cars) |
| LDDT12 | Light-duty Diesel Trucks 1 & 2 (0-6,000 lbs. GVWR) |
| LDDT34 | Light-duty Diesel Trucks 3 & 4 (6,001-8,500 lbs. GVWR) |

Maine Fuel Tax Revenue Projections: Change in Fleet Fuel Efficiency



## 1. Introduction

### *I.1 Maine's Transportation sector*

The state of Maine spans over 30,000 square miles and is connected by the 22,670 miles of public roads[3] that traverse the State, as well as the nine freight railroads, five major transit systems[4] and twelve toll ferries that serve the state. Over 32 million dollars of freight shipments leave Maine each year while over 4 million tons of commodities are transported by rail from Maine. Additionally, Maine is fourth in the nation in the number of US-Canadian border crossings for commercial and passenger vehicles. Including these figures with the fact that Portland is the 25th largest waterport by tonnage in the nation, a clear picture emerges that Maine's transportation infrastructure is a substantial contributor to the Maine economy (BTS, 2004).

Maine is dependant on its transportation infrastructure for continued economic strength and growth, particularly the public roads. Maine ranks fourteenth in the nation for the largest number of highway miles traveled annually per capita - 14,912 per year. Additionally, 89% of Maine's work force commutes to work by passenger vehicle with over 1 million passenger vehicles registered in the state of Maine (as of 2005: 499,554 cars, 222,998 light-duty pickup trucks, 167,665 SUVs and 80,515 vans; total fleet including heavy-duty vehicles of 1,061,471). Maine is highly reliant on its road system because large areas of the State lack transportation alternatives. This means that the current and future condition of the roadways is a major concern. Twenty percent of Maine's public roads are listed in either "mediocre" or "poor" condition, while 69% are

[3] Sixty-one percent of Maine's roads are owned by town or municipal governments while 37% are owned by the state.

[4] The five transit systems and the municipalities served are: Greater Portland Transit (Portland), Casco Bay Island Transit District (Portland), City of Bangor (Bangor), Western Maine Transportation System (Lewiston-Auburn) and the Regional Transportation Program (Portland).

listed as 'fair' or worse (BTS, 2004). How such a crucial infrastructure will continue to be supported and enhanced financially to meet the growing needs of the state must be considered carefully.

### *1.2 The Role of the Motor Fuel Tax- Current Revenues*

Currently in the United States, the primary source of funding for transportation at the state level is the motor fuel tax. Maine Statute Title 36 Part 5 'Motor Fuel Taxes' governs Maine's motor fuel excise taxation. Chapter 451 of this Title dictates the motor fuel excise tax on gasoline at 25.9 cents per gallon effective July 1, 2005 and is a crucial part of the financial support required to maintain and enhance Maine's transportation infrastructure (Maine Revenue Service, 2005(b)). In 2004, the fuels tax was 8% of the State's total revenue, and 68% of the Highway Fund. (Maine Revenue Services, 2005(c)). Maine implements additional motor fuel taxes on other fuels under Title 36 Part 5 Chapter 459 entitled 'Special Fuels.' These special fuels include diesel fuel, propane, compressed natural gas and others. Of particular relevance for this report, the diesel fuel excise tax is 27 cents per gallon in Maine. A majority of the revenue generated from the gasoline excise tax is designated to the highway fund, and all of the revenue from the special fuel excise tax is dedicated to the highway fund.[5] However, Maine's excise tax statutes also allow for refunds of the motor fuel excise tax for off-highway vehicles including tractors used for agricultural purposes and recreational boats.

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[5] Revenue not designated to the highway fund is dedicated to the following state agencies depending on non-highway vehicle use: Department of Marine Resources Boating Facilities Fund; for snowmobile purposes of the Department of Inland Fisheries and Wildlife and the Department of Conservation; for ATV purposes split equally between the Department of Inland Fisheries and Wildlife and the Department of Conservation. Source: http://www.maine.gov/legis/ofpr/04compendium/2004compendium.htm#GASOLINE%20TAX

### *1.3 Concerns for Revenue Erosion*

Of particular concern for the State is the erosion of motor fuel excise taxes as a primary basis for funding Maine's public road infrastructure. Maine experienced a 10% decrease in state per capita spending on transportation between 2002 and 2003, from $1.93 per capita to $1.72 (AASHTO, 2004 pg. 3-9). This low per capita spending ranks Maine 29th in the nation for per capita spending on transportation.

### *1.4 Reasons for Declining Revenues from Motor Fuel Excise Taxes*

Transportation policy makers have identified a number of threats to fuel tax revenue. First, tighter standards for light-duty trucks, SUV's and mini-vans announced in August 2005 are expected to increase the fuel efficiency of the vehicle fleet nationwide (model year 2005 light-duty vehicles have the highest average fuel efficiency since 1996).

The increasing market share for alternative fuel and hybrid vehicles also may lead to an erosion of the base of the motor fuel excise tax. This is especially true given the recently adopted National Energy Bill 74-26, which gives incentives for alternative and hybrid vehicles. These incentives include tax credits for purchases of hybrids, based on fuel economy that will range from $250 to $3,400.[6] Hybrids currently comprise 0.12% of the Maine passenger vehicle fleet, and 1.52% of the model year 2005 vehicles available. However, to date, the number of dedicated alternative fuel vehicles has been too small to have a significant impact on fuel tax revenues. In fact, a provision of the AMFA, which gives favorable CAFE treatment for flexible and dedicated fuel vehicles, may have led to a decrease in fuel efficiency of the vehicle fleet and the increase in gasoline revenues (NHTSA, 2005 (b)). In addition, in the current economic climate

[6] Tax credit range estimated by American Council for an Energy Efficient Economy.

where per gallon gasoline prices have reached a high of three dollars, citizens who cannot afford newer fuel efficient vehicles may curtail their driving, although the empirical evidence suggest the magnitude of these changes are small, especially in the short run.[7]

The declining purchase power of motor fuel tax revenue is also cause for concern. While Maine, unlike other states, has tied the gas tax to an inflation index, this index is not necessarily sufficient in retaining the strength of the gas tax against the pressures of inflation.[8] A NCHRP problem statement indicates that even accounting "for inflation and fuel efficiency…, the motor fuel tax today generally provides approximately one-third of the purchasing power it did in the 1960's" (NCHRP, 2005).

Finally, the cost of materials for transportation projects increases more than the general rate of inflation primarily due to demand for materials and labor. Despite the declining ability of the motor fuel tax to provide sufficient revenue, the demand on this revenue and the infrastructure it supports has experienced an increase. This increase stems primarily from increased congestion and by the prevalence of other non-highway activities that may be eligible for funding by motor fuel tax revenue.

## 2. Review of Literature – Transportation Funding Alternatives

### *2.1 Highway Funding*

Maine is not alone in relying on the motor fuel taxes and in facing threats to this revenue stream. A large body of research exists which examines alternatives for funding and maintaining transportation infrastructure. Many of these are simultaneously aimed at generating revenue and addressing other transportation issues such as congestion. This

[7] "The demand for gasoline is quite insensitive to changes in the price of gasoline. Thus, even substantial increases in the price of gasoline, especially in the short term, are likely to cause consumers to make only small decreases in their consumption. The short-term and long-term price elasticities are generally taken to be -.10 and -0.20, respectively. (Greene 1998)

[8] Inflation Index information available at www.maine.gov/legis/ofpr/04compendium/c04opfl.htm

section will report on alternative funding options identified through an extensive literature review of nationally and internationally recognized leaders in the transportation field including: Transportation Quarterly, Transportation Research Board and the Brooking Institute's Series on Transportation Reform. Each financing option will be discussed with respect to benefits, concerns and available case studies. To assist in presentation, four categories of alternative funding options are used as an organizational tool. The four categories are: taxes, road/direct pricing, tolls and fees.

### *2.2 Taxes*

#### 2.2.1 Alternative Gas Tax Structures

One of the primary benefits of the motor fuel tax is that the tax is collected in small increments, which typically makes it less objectionable to consumers. However, raising the tax rate often becomes a politically charged situation as evidenced in Washington State with Initiative 912.[9] The political difficulty in raising the rate is a partial explanation for the lagging purchase power of the gas tax. An example of this reduction in purchase power can be seen in the federal motor fuel tax, which has declined from 18.3 cents per gallon in 1993 to 9.3 cents per gallon in 2003 (ME DOT, 2005).

An alternative gas tax structure known as 'Inflation Responsive' or 'Variable Rate Gas Tax' involves indexing gas tax rates to a measure of inflation to combat erosion in purchasing power, and to avoid the politically charged situations that often accompany legislated increases in tax rates. Maine has taken one of the initial recommended steps in pursuing this alternative by tying the tax rate to a measure of inflation, as authorized in the Maine statutes by Title 36 Part 5 Chapter 465. One option for Maine to increase gas

[9] See the Washington State Department of Transportation's 2005 Transportation Tax Package Information Site for more information on this issue at http://www.wsdot.wa.gov/Projects/Funding/2005/

tax revenue would be to change the inflation index rate to one more in line with the construction industry, such as the PPI.

A concern regarding the use of any type of fuel tax is that gasoline taxes are generally considered regressive taxes, and disproportionately shift the burden of these taxes to the poor and middle class, who typically are unable to purchase newer vehicles that may be more fuel-efficient (Chernick and Reschovsky, 1997).

2.2.2 Local Option Transportation Taxes

The implementation of Local Option Transportation Taxes (LOTT) has become more prevalent in recent years as states struggle to find options that can supplement, and possibly replace, lagging motor fuel tax revenue. LOTT's involve the implementation of a tax at the local level, where revenue is earmarked for transportation use. The rate of LOTT's could therefore vary within a state and the revenue generated would be controlled at the regional or local level. Following the categorization of LOTT options used by Goldman and Wachs (2003), four variations of LOTT's will be discussed: Fuel Taxes, Sales Taxes, Vehicle Taxes and other options including Natural Resource Extraction and Payroll Taxes. Currently, nine states authorize local option fuel taxes, twenty-three states authorize sales taxes, and sixteen states authorize vehicle taxes (Table A.2) (Goldman and Wachs, 2003).

*Fuel Tax:* A local option fuel tax calls for a percentage tax on gasoline sales, with the percentage determined by local officials and the revenue set aside for local transportation needs. The literature regarding LOTT fuel taxes indicates that this option has limited benefits, and a number of issues, which may limit long-term viability. The primary benefit of this alternative is that the tax is easily administered by local

governments and provides for local control of revenues. In addition, local fuel taxes also ensure that local vehicle drivers are the primary source of revenue for this tax, which addresses some equity concerns (Goldman and Wachs, 2003). Another advantage of gasoline excise taxes is that they are relatively stable (Goldman and Wachs, 2003). That is, the income and price elasticity of demand are small, thus month-to-month and year-to-year revenues are relatively stable and predictable.

However, the presence of varied tax rates on fuel at the local level may jeopardize competitiveness of local businesses. Given the limited tax base for a local tax, the rate would need to be set at a level that, at a minimum, supports revenue collection. This higher rate may in fact drive consumers to seek fuel outside the taxed area. A final concern is that, as previously mentioned, motor fuel taxes may not be a long-term solution to the transportation financing problem.

*Sales Tax:* The LOTT sales tax option has become more prevalent as twenty-three states have authorized the use of local option sales taxes for transportation funding (Goldman and Wachs, 2003). This financing option implements a sales tax at a local or state level, and earmarks the revenue for transportation funding. LOTT sales taxes have a number of benefits identified in the literature. First, if the sales tax is implemented at the state level, a broad revenue base will be covered by the tax. In addition, such a tax will garner high revenue for a low marginal tax rate, which may assist with the difficulty of consumer acceptance of new taxes. Another attractive component of the LOTT sales tax is the horizontal equity component. If revenue is used for a variety of transportation systems (e.g., not just roads) the sales tax system will ensure that all transportation users pay for maintaining the systems. Under the current fuel tax system, the transportation

fund pays for bicycle and pedestrian projects; thus non-motorists do not necessarily pay the fuel tax but do benefit. The LOTT sales tax ensures that all users pay. In addition, the sales tax would allow for direct involvement by voters in implementing and maintaining the taxation level, which may promote increased acceptance of new taxes. A final benefit of the LOTT sales tax may be particularly applicable to Maine. The LOTT sales tax would provide revenue from non-residents. As tourism constitutes a significant portion of Maine's sales, the implementation of a sales tax would garner revenue from out-of-state visitors who utilize the transportation infrastructure.

As with all financing options, LOTT sales taxes have a number of issues which may limit implementation viability. First, sales taxes are prone to revenue instability since revenue may decline during times of recession. Second, LOTT's do not encourage more efficient use of transportation systems because all members of the community pay. Thus, no incentives exist for decreasing use of the transportation infrastructure.

*Case Study: Georgia*

- Georgia, "LOTT": The State of Georgia has implemented the fuel tax variant of the Local Option Transportation Tax statewide. Any Georgia business that holds a 'sales & use tax license' must pay a local option sales tax based on net receipts. In the event that a firm does not hold such a license, the fuel supplier is responsible for collecting the local option fuel tax. This pre-paid LOTT tax replaces the motor fuel tax.[10] In total, local governments in fifteen states have implemented LOTT fuel taxes for transportation funding purposes. It should be noted, however, that many of these states have implemented such taxes only in metropolitan areas (Goldman and Wachs, 2003).

[10] Additional Information on the Georgia Tax, including rates, can be found at the Motor Fuel Tax site: http://www.etax.dor.ga.gov/motorfuel/mf_prepaidtax_070105.pdf

*Vehicle taxes:* Another LOTT option employed by portions of sixteen states is the taxation of vehicles often based on value, age, class or a flat annual registration fee (Goldman and Wachs, 2003). Six states employing this option require a public vote for changes to the vehicle tax. States that collect vehicle taxes often contribute this revenue stream to general funds, although the revenue also may be earmarked for transportation needs (Goldman and Wachs, 2003). A discussion of how flat registration fees may be varied to enhance revenue streams will be included under the 'Fees' portion of this literature review.

*Other, Natural Resource Extraction:* Another LOTT option levies a weight-based charge on natural resources extracted from a state. Since these industries often utilize rural roads that are untouched by other users, a natural resource extraction tax can be viewed as a means of financing maintenance of these roads (Goldman and Wachs, 2003). In Maine however, many of these rural roads may be privately owned. The primary obstacle in implementing or increasing this type of tax is political feasibility. Given Maine's natural resource based economy, implementing a natural resource extraction tax may endanger the competitiveness of Maine businesses.[11]

*Other, Payroll Tax:* A payroll tax is a supplementary LOTT option. The benefits of this option include the ability to finance urban transit, where businesses whose employees utilize a transit system will be partners in funding the system. This particular

[11] Title 36 (Sections 2721 through 2726) of the Maine constitution calls for the implementation of a Commercial Forestry Excise Tax on landowners of more than 500 acres of commercial forestland. This tax is not a resource extraction tax, as the purpose of the tax is to pay for forest fire protection expenditures. The cost is 32 to 38 cents per taxable acre annually. Additional information is available from the Maine Revenue Service at http://www.maine.gov/revenue/propertytax/sidebar/commercialforestry.htm

option may not be feasible for Maine, given the limited number of urban centers and the lack of urban transit systems.

In summary, local option transportation taxes, particularly sales taxes, may present an option that warrants further consideration in Maine. The primary benefits of generating revenue from a broad base as well as obtaining revenue from non-residents may be appropriate for Maine.

2.2.3 Taxation of Alternative Fuels

As noted earlier, alternative fuel vehicles and hybrids have become slightly more prevalent in the vehicle fleet, particularly with the climbing price of gasoline. Light-duty diesel vehicles are projected to experience a growth in market share from 1.5 percent of total light-duty vehicles in 2003 to 4.4 percent in 2025. "Alternative fuel vehicles...are projected to grow from 1.7 percent of the 2003 total to 2.2 percent in 2025" (AEO, 2005). Additional high-technology case projections predict much greater advanced technology and alternative fuel vehicle use. One financing option that may help to alleviate the erosion in revenue due to alternative fuel vehicles is levying a tax on alternative fuels used in such vehicles, including natural gas. Currently, the State of Maine levees such a tax on diesel fuel, methanol, ethanol and compressed natural gas, all of which may be alternative fuel sources (Table 1). Despite the rise in hybrid vehicles (0.72% of the model year 2004 vehicles registered in Maine are hybrids), alternative fuel vehicles still have a very limited market penetration in Maine (0.13 % of the Maine vehicle fleet are hybrids). Accordingly, it is not likely that revenue obtained from these fuels will be able to adequately supplement or act as a substitute for the motor fuel revenue stream.

Table 1. Maine Alternative Fuel Tax Rates

| Fuel Taxed | Tax Rate effective July 1, 2005[12] Cents/gallon |
|---|---|
| Diesel | .270 |
| Propane | .188 |
| Methanol | .147 |
| Ethanol | .183 |
| Compressed Natural Gas (CNG) | .224 (per 100 cubic feet) |

### *2.3 Road/Direct Pricing*

#### 2.3.1 Area Charging/Cordon

Area Charging, also known as Cordons, are funding options that implement a charge for operating a vehicle in a specified area, generally a metropolitan center. Existing cordons, for example in London, Singapore and various Norwegian cities, utilize electronic sensors to monitor the perimeter of the cordon area to ensure compliance. In addition, the Singapore cordon charge varies by location of crossing, as well as by day and time of crossing (TRB, 2003). While area charging or cordons are best known as congestion management techniques, they also can be used as a revenue enhancement option.

The primary benefit of area charging or cordons is that these options encourage increased use of mass transit and pedestrian travel. These policies are thus consistent with long term policy objectives of reducing pollution, noise, fuel use and road wear. Cordons also may serve to reduce economic losses from congestion. An additional advantage is the presence of a large revenue base when cordons are implemented around major metropolitan areas. One concern with cordons is the possible encouragement of sprawl, as businesses and citizens move outside the area to avoid charges. With existing cordons, such as in London, residents living within the cordon are generally given

[12] Taxation rates obtained from the Maine Revenue Service: www.maine.gov/revenue/fueltax/Tax%20Rates.html

generous discounts to decrease the sprawl incentives. A second concern is that boundary effects may be created, encouraging motorists to increase their miles traveled as a means of avoiding the charged area.

*Case Study: United States*

- Fort Meyers, Florida Cordon Toll: Since 1998 Fort Myers has implemented a cordon toll at facilities located at the north and south approaches to the island Town of Fort Myers Beach.

*Case Study: International*

- Norway City Center Cordons: The Norwegian cities of Bergen, Oslo and Trondheim all have toll rings (or cordons) surrounding the city centers.

- London City Center Cordon: Since February 2003, a cordon has been in place around London, England. The charge to enter between 7am and 6:30 pm is £5 ($8). Feasibility studies regarding the use of cordons for Edinburgh and Leicester have been proposed.

2.3.2 Congestion Pricing

Congestion pricing is the implementation of variable prices to motorists' dependant on time of travel and prevailing congestion level. This option may be implemented on select roadways via lane management, or throughout an area by implementing electronic tracking devices (see discussion of Puget Sound Case). This option typically is considered a congestion management technique, but also may be used as a revenue enhancement option. Currently, a number of examples of congestion pricing are present in the United States. In California, State Route 91 utilizes a system of congestion pricing where middle lanes are toll lanes and are priced based on congestion levels while the remaining lanes continue to be toll-free. A second example exists in Lee County, Florida where bridge tolls are reduced during off-peak periods to encourage drivers to travel during these times (Rufolo and Bertini, 2003).

The primary benefits of this option are reduction in congestion and promotion of mass transit and/or carpooling. This option may face public resistance when varying toll levels are implemented where previously fixed levels were in place.

*Case Study: Puget Sound (Washington)*

- Work by the Puget Sound Regional Council is investigating the feasibility of electronic congestion pricing. Electronic units were installed in 500 pilot program vehicles in 2004, and are able to detect when a vehicle travels on roadways subject to congestion tolling; much like the former Maine Transpass system. The units display the charge per mile for travel on the particular roadway. The study is focused primarily on gauging driver reaction to congestion pricing (Puget Sound, 2004).

2.3.3 Distance Based Charges

One of the most widely considered alternative financing options involves distance-based charges, also known as vehicle-miles-traveled programs. These types of programs consist of a vehicle user fee dependant on the distance traveled. There are a number of programs either proposed or operating both internationally and within the U.S. that will be discussed in the case studies below. Distance based charges may rely on technology that tracks miles as they are traveled or may be based on odometer readings garnered at state-mandated inspections or registrations.

There are a number of promising benefits associated with distance-based charges. First, many of the trial programs foresee these charges serving as a replacement for the fuel tax because the charges would not lose effectiveness from increasing fuel efficiency in the vehicle fleet. Distance-based charges also may serve to encourage more efficient behavior such as increased mass transit use and carpooling (Wachs, 2003). This set of benefits is consistent with other policy initiatives, which promote decreased vehicle use in an effort to improve environmental quality. In addition, this option may be

implemented gradually, which may lower public resistance. In the Oregon case study, motorists who chose to adopt the technology will begin paying the mileage fee, while those who do not will continue to pay the fuel tax ensuring that all vehicles are contributing revenue.

Concerns surrounding this option center on technology and privacy issues. While a number of case studies have developed viable technology, concerns remain that such technology cannot be implemented on a wide scale, or will invade the privacy of motorists. In addition, GPS technology is "only as good as the base map telling the system where vehicles are traveling"(NCHRP, 2005). Equity concerns also are raised in that the tax burden may shift to more rural areas. Because fuel efficiency in city settings is typically lower, urban drivers consume more fuel per mile. Thus, under a vehicle-miles-traveled plan, city drivers may contribute less revenue than under the existing fuel tax system (Sorenson and Taylor, 2005). Additional concerns apply if distance based charges are odometer-only based, because of possible high levels of evasion and difficulty in capturing out of state travelers.

*Case Studies: International*

- Netherlands, Mobimeter: The Netherlands has proposed a system entitled "Mobimeter," a kilometer based charge on vehicle travel with operational capacity in 2006. The initial pilot was intended to be revenue neutral, where vehicle owners would pay no more under the "Mobimeter" than under the current system if they drove less than 18,000 kilometers per year. The system may eventually include a congestion control component, where the per kilometer charge may vary depending on travel in congested areas (TRB, 2003).

*Case Studies: United States*

- University of Iowa, "New Approach": Work at the University of Iowa also has centered on mileage-based fee systems. The researchers envision their work as a possible long-term replacement of the fuel tax for passenger vehicles as well as commercial vehicles. The University of Iowa system employs GPS and GIS, and intends to distinguish the number of miles driven in an individual state by a vehicle. The work also considers variable charging for commercial vehicles dependant on the type of road the vehicle is traveling. (TRB, 2003; Sorenson and Taylor, 2005).

- Oregon, "Road User Fee Task Force": One of the most promising examples of implementing distance-based charges is being conducted by the Oregon Road User Fee Taskforce. The Taskforce was created in 2001 under legislative action HB 3946 and charges the task force to investigate various alternative financing options, much as the state of Maine is currently undertaking.[13] The pre-pilot of 20 vehicles began on October 24, 2005, with recruitment and installation of technology in up to 280 vehicles planned during Winter 2005. The pilot program will be implemented throughout 2006 and 2007, with preliminary results by summer of 2007 and possible legislative action thereafter. (TRB, 2003; Oregon DOT, 2005)

2.3.4 Managed Lanes/Value Pricing/ High Occupancy Vehicle Toll Lanes (HOT)

The premise of the managed lanes system, also known as value pricing, is to allow vehicles to buy their way out of traffic. A related concept is High Occupancy Vehicle Toll Lanes (HOT), which also will be discussed here. These options typically are utilized for congestion management, and are best implemented in urban areas with a multiple lane infrastructure. Individual lanes can be designated as high occupancy vehicle lanes, toll-free lanes or toll lanes. The cost of toll lanes may vary dependant on the time of day and amount of congestion present. Under an HOT program, a single occupancy motorist may pay a fee to travel in the HOV lane, where the fee may vary depending on time of day and level of congestion.

One benefit of this type of program is the presentation of options to motorists who can place a cost value on their own time (Muthusway and Levinson, 2003). This

[13] Road User Fee Task Force Act:
http://www.oregon.gov/ODOT/HWY/OIPP/docs/FinalReportA2003march.pdf

approach also may assist in congestion management. However, equity becomes an issue for these types of approaches. HOT and toll lanes have acquired the names of "Lexus Lanes" indicating that generally only the wealthy utilize these lanes. In addition, it can be argued that implementation of toll lanes decreases the amount of infrastructure capacity available to the general public.

*Case Studies*

- California, Orange County SR-91 and I-15: State Route - 91 utilizes a variable price for HOT lanes where the price is dependant on the level of congestion on the roadway. Interstate-15 in San Diego uses the HOV lane as an HOT lane where the price is adjusted every six minutes in order to maintain the required service level mandated for HOV lanes (Rufolo and Bertini, 2003).

- Texas, I-10 and US 290: HOT lanes are operational in Texas on I-10 (Katy Freeway) in Houston and on US 290 in Houston.

### 2.3.5 Value Capture

One source of infrastructure stress is the creation by private development of new commercial or residential roads that tie into existing roadways. These new roads generally become the responsibility of the municipality or state upon completion, putting additional stress on limited resources. A financing option designed to assist with this common problem is to require developers to pay for the maintenance of roads created during development. The primary benefit of this option is that local and state agencies are no longer fiscally responsible for the maintenance of these roads. However, a primary concern of this option is public safety where developers may not maintain the roads consistent with the standards of local and state agencies.

## *2.4 Tolls*

### 2.4.1 Facility Congestion Tolls

A widely used financing option is Facility Tolls and a variant, Facility Congestion Tolls. Facility tolls are user fees paid by motorists to use a specific facility, such as a bridge or tunnel, and are very common throughout the United States. Examples of the Facility Toll include the Williams Tunnel in Boston, the Chesapeake Expressway and the Emerald Mountain Expressway Bridge in Alabama. The Facility Congestion Toll varies the user fee for the facility based on the congestion level present. One benefit of the Facility Congestion Toll is that it may encourage use of mass transit as a means of avoiding the toll. The toll also may manage or reduce congestion as motorists adjust their travels to avoid high toll rates.

The primary concerns regarding this option center on equity. Facility Congestion Tolls often are used to finance projects or improvements unrelated to the facility where the toll was collected. In such cases the toll could no longer be considered a user fee, since the benefits of the toll profit a group other than the facility user/payer (Peters and Kramer, 2003). In addition, tolls are considered regressive because of the burden on poor or middle class motorists. Finally, work by Peters and Kramer (2003) has shown that generation of vehicle exhaust pollution is far greater at toll facilities than at highway speeds and that the pollution costs up to 8.3% of the revenue collected at the tolls (Peters and Kramer, 2003).

*Case Studies*

- Fort Meyers, Florida Cordon Toll: Since 1998 Fort Myers has implemented a cordon toll at facilities located at the north and south approaches to the island Town of Fort Myers Beach. The toll amount is congestion variant.

- Tappen Zee Bridge Congestion Relief Study: A Federal Highway Administration Congestion Pricing Pilot Project was conducted in 1998 on the Tappen Zee Bridge. The flat fee of $1.00 was replaced during the study with a congestion price dependant upon time of travel and also allowed for travel along the shoulder for a varying fee. The study found that various congestion pricing led to decreased net volume changes during peak hours as high as 11% (NY State, 1999).

2.4.2 Weight-Distance Tolls/Tax

A primary objective of an alternative financing option is to ensure that vehicle operators internalize, or consider, the external cost they are imposing on the roadway infrastructure. Heavy goods vehicles (HGV's), frequently known as commercial trucks, impose a greater external cost on roadways than passenger vehicles. Accordingly, an alternative financing option should ensure that HGV's support the high external cost they impose (TRB, 2003). The Weight-Distance Toll/Tax option is based on the premise that HGV's should pay a higher user fee. There are a number of variations on this financing option. First, HGV's may pay a higher toll at toll facilities based on their weight (or some variation such as axle configuration), as currently used by the Maine Turnpike Authority. Second, in a variation based on distance charges, HGV's would pay a higher per-mile rate based on the weight of the vehicle.

One benefit of this financing option is that such tolls or taxes on HGV's allow for payment commensurate with the amount of damage that HGV's impose on roadways. A second benefit is that this system helps close the price variation between the rail and road sectors, and captures more of the value associated with transporting goods (TRB, 2003). Currently, highways are traveling warehouses where suppliers are not charged for 'storing' their goods on Maine's roadways as they travel. Transporting these same materials by rail would include a 'storage' surcharge as part of the price. One concern

with this type of system is the impact on the competitiveness of Maine's trucking reliant industries. Given that the Maine economy relies heavily on resource extraction industries that require the use of HGV's to transport goods, the impact of weight-distance tolls or taxes on these industries must be considered carefully.

*Case Studies: International*

- Eurovignette and the new Kilometer Charge System: The Eurovignette system imposed a standard license charge on HGV's for travel in Belgium, Denmark, Germany, Luxembourg, the Netherlands and Sweden that varies based on the axle configuration and emission standards (TRB, 2003). In fall of 2003 this system was adjusted to a per-kilometer charge dependant on engine emission standards and axle configuration. Vehicle operators may either use an on-board electronic unit that tracks vehicle data including travel distance or manually pre-book a route they intend to travel at a toll terminal or on the internet.

### *2.5 Fees*

#### 2.5.1 Distance Based Fees/Price Variability Programs

The premise behind variable price programs and distance-based fees is to replace the currently fixed prices of automobile ownership with variable prices dependant on usage (i.e., vehicle miles traveled) in an effort to accurately capture the external cost imposed by vehicle use. Examples of current fixed programs that would be affected by this option include insurance rates, registration fees and title fees. The primary benefit of these programs is that vehicle operators will be able to control their own savings or costs by adjusting their driving habits. In addition, this option compliments other policy initiatives including encouraging less vehicle travel to promote lower emissions.

One of the primary concerns surrounding this option is the probability of evasion. Given that people may resist variation in previously fixed fees, they may take steps to evade the fees.

*Case Studies: United States*

- Georgia Institute of Technology, "Variable Cost Study": Work at the Georgia Institute of Technology has centered on variable price initiatives, including the feasibility of tying vehicle registration to per-mile costs. The first year of study has been focused on driver response to variable fees but research is ongoing and a report of findings is not expected for at least two years (TRB, 2003).

- Minnesota Department of Transportation, "Pay as you Drive (PAYD)": The Minnesota DOT is investigating mileage based options for previously fixed costs such as vehicle leasing and insurance. Given the private market nature of some of these possibilities, the DOT enlisted private partners to join in the study, but have encountered difficulties in maintaining partnerships (TRB, 2003). A summary evaluation of findings was initially scheduled for 2005, but efforts have been unable to locate any such publication.

*Case Studies: International*

- Progressive Insurance/Norwich Union, "Variable Insurance Cost Study": Progressive Insurance Company teamed with Norwich Union of the United Kingdom in 2003, to follow up on a 1998–2001 study investigating driver discounts based on driving habits, including fewer miles traveled (TRB, 2005). The partnership was expected to complete the data-gathering phase of the project in late 2004. Norwich Union is currently offering Pay-As-You-Drive insurance as part of their insurance programs (Norwich Union, 2005).

### 2.5.2 Environmental Efficiency Charging (Emissions Fees)/Fuel Efficiency Fee

In an invited presentation to a 2002 Conference held by the Transportation Research Board, William Ankner suggested that user fees for vehicle use (such as registration fees) could be levied on the basis of a vehicle's energy efficiency and environmental emissions (TRB, 2003). The primary benefit of this option is that it is inline with other policy initiatives such as the promotion of buying "greener" cars. This option also may create incentives for the public to obtain additional knowledge regarding the environmental information of vehicles.

This option may meet with substantial resistance from consumers as well as auto manufacturers.

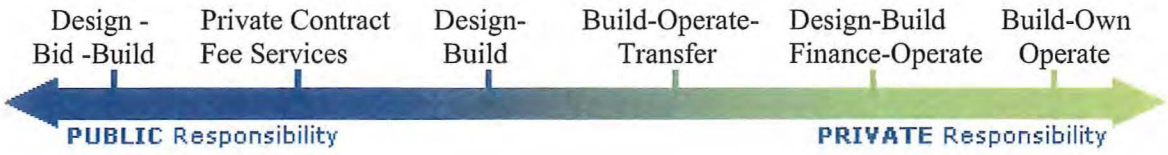
*Case Studies: International*

- Eurovignette and the new Kilometer Charge System: Germany, as part of the comprehensive Kilometer Charge System, varies the per-kilometer charge for HGV's based on the engine emission standards of the vehicle (TRB, 2003).

### *2.6 Public-Private Partnerships*

A number of states are turning to public-private partnerships in an effort to meet the changing demands of infrastructure maintenance and creation. The role of private companies in transportation infrastructure typically has been limited to serving as consultants to public agencies or acting as independent contractors to provide construction services, equipment and materials pursuant to low-bid contracts (Yarema, 2002). This approach is sometimes referred to as "design-bid-build" procurement where the public sector retains responsibility for financing, operating and maintaining the infrastructure produced during a project (FHWA, 2005(b)). Increasingly however, public-private partnerships have led to mounting responsibility by the private sector. The Federal Highway Administration has created a diagram that indicates the level of responsibility held by the public or private sector under various partnership types.

Figure 1. Federal Highway Administration's Assignment of Responsibility For Public Private Partnerships




While design-bid-build has been the traditional partnership structure, the 'private contract fee service' expands the role of the private contractors by transferring responsibility for services generally handled by state agencies to private sector companies through a

competitive bidding process. Operations/maintenance or financial management are two of the services that many state agencies are turning over to private sector partners (FHWA, 2005(b)). Another partnership type is a 'design-build' arrangement where private companies provide final design elements together with construction in a single contract for new-capacity projects. These contracts typically are publicly funded and owned, although the private contractor may provide some financing in the form of development cost advances or other mechanisms. Following along this continuum towards greater private sector involvement are forms of partnerships called 'build-operate-transfer' and 'design-build-operate-maintain.' These types of contracts allow for a private entity to complete an entire project, with public funding, with the private entity providing long-term operation and maintenance on the project at a cost previously arranged with the public partner. Some 'design-build-operate-maintain' contracts can allow the private contractor to own or lease the facility under contract, and to utilize private financing (Yarema, 2002). The 'design-build-finance-operate' option combines the responsibilities for designing, building, financing and operating into one private sector contractor. Some 'design-build-operate-maintain' contracts can also allow for the private contractor to own or lease the facility under contract, and to utilize private financing (Yarema, 2002). These types of projects are "either partly or wholly financed by debt leveraging revenue streams dedicated to the project" (FHWA, 2005(b)). A common revenue source is direct user fees or tolls as discussed in Section 2.4. The final public-private partnership arrangement grants the right to "develop, finance, design, build, own, operate, and maintain a transportation project" to a private sector partner (FHWA, 2005(b)).

The benefits of the various public-private partnership types described above include the ability to complete a greater number of projects at a faster rate. In addition, some states are turning to these partnerships as a means of decreasing the cost of new projects (TRB, 2002). There is still concern in the transportation field regarding the ability of public-private partnerships to meet the needs of the public transportation agencies. Moreover, NASHTU reports have indicated that contracting out to accomplish transportation work may actually cost more money, citing the example of Boston's "Big Dig" which experienced overruns in amounts greater than one billion dollars (Kusnet, 2002). Another concern with public-private partnerships is the issue of public safety and whether private contractors will meet the rigorous safety requirements of state and federal governments. The assignment of risk, particularly operating revenue risk, is of particular concern as public-private partnerships evolve.

There are a number of cases where state transportation agencies have entered into partnerships with private entities; the State of Maine is no exception.

### 2.6.1 Maine Department of Transportation: Public-Private Initiatives

The Maine Department of Transportation has successfully completed a number of projects, for both roadways and intermodal or transit projects, utilizing public-private partnerships. Three successful roadways projects, including the Waldo-Hancock Bridge, the Sagadahoc Bridge in Bath and the Cushnoc Crossing located in Augusta, have all been completed using the design-build partnership arrangement.

Maine also has successfully joined public-private partnerships to fund intermodal and transit facilities. Three of the most prominent projects are included as case studies.

*Case Studies*

- Portland Transportation Center: The Maine DOT in partnership with Concord Trailways developed the Portland Transportation Center, which serves rail and bus passengers. This partnership could be classified as a Build-Own-Operate partnership. The Portland Transportation Center was formerly a Concord Trailways bus station until partnership with the DOT expanded the services offered at the Center to include Amtrak rail and metro bus service. Concord Trailways financed the expansion of the building to accommodate the differing transportation forms, with design input by the Maine DOT. This on-going partnership includes building ownership and maintenance by Concord Trailways with ownership of the rail platform held by the DOT.

- The Explorers (*Island Explorer, Mountain Explorer* and *Shoreline Explorer*): The *Island Explorer*, a free bus service for all passengers, is a well-known sight around Mount Desert Island and Acadia National Park. The bus service stems from a unique public-private partnership. The need for the Island Explorer was motivated by a study administered by Acadia National Park and the Department of the Interior to gauge how congestion was affecting consumer enjoyment of the park. The study found that congestion, safety concerns due to parked vehicles, and pollution were hindering positive visitor experiences at the park. Additionally, there was interest throughout the communities and businesses of Mount Desert Island to provide transportation for visitors and residents to various areas of the island, including access to the cruise ship ports. A public-private partnership developed between the Maine DOT, Acadia National Park and the communities and businesses of the island. LL Bean joined the partnership in an effort to provide extended service by the Island Explorer into the fall months.

  A 2000 study found that intelligent transportation technology improvements to the Island Explorer fleet, including passenger counts, automated announcements, automated departure signs throughout the island and automatic bus tracking systems improved the visitor experience. This unique and enduring partnership has served as a model for other 'Explorers' around Maine, including the Mountain Explorer and the new Shoreline Explorer. The *Mountain Explorer* operates in the Bethel area and is a partnership between the Maine DOT, the Bethel Chamber of Commerce, Sunday River Ski Area and area businesses. The *Shoreline Explorer*, to be unveiled this summer, is a multi-modal public-private partnership which partners three private trolley companies, a public trolley company, the municipalities of York, Wells, Kennnebunkport and Ogunquit in collaboration with the Maine DOT.

- Maine 511 System: Maine in collaboration with the states of New Hampshire and Vermont, as well as Castlerock, a private partner, worked to develop a traveler information system. This system, known as the 511 System provides information via web (www.511maine.org) or phone regarding road conditions, accidents and tourism attractions/events. The system also includes advisory signs on Maine's roadways. This partnership has extended to 22 states that use the 511 System. However, Maine continues to lead with innovations as Island Explorer information is available on 511, and all information is also available in French.

2.6.2 Virginia Department of Transportation: Public-Private Transportation Act

The Public-Private Transportation Act (PPTA) of 1995 allows the Virginia Department of Transportation (VDOT) to enter into partnership with private entities in order to design, build and maintain their infrastructure.[14] According to Shirley J. Ybarra of the VDOT, the original intent of the PPTA legislation was to generate projects faster and cheaper. She also noted in a discussion session at a 2003 TRB conference, that in public-private relationships, the most costly risk is often held by the public sector and that improvement in risk sharing should be a goal for future projects.

The VDOT evaluates public-private proposals based on a six phase process: 1) quality control, 2) independent review panel, 3) Commonwealth Transportation Board recommendation, 4) detailed proposal submission, 5) negotiation, and 6) interim and/or comprehensive agreement.

A comprehensive list of projects completed under the PPTA is available from the VDOT and a case study is included below for reference.

*Case Study*

- Richmond, Virginia Route 288: Under the Public-Private Transportation Act of 1995 (PPTA), the Virginia Department of Transportation awarded a $236 million contract to APAC-Virginia, Inc. of Danville for the completion of Route 288. The Virginia Department of Transportation (VDOT) expected the project to save $47 million and seven months in construction time. The project was completed in November 2004.[15]

2.6.3 Washington State: The Public-Private Initiatives in Transportation Act

Washington State passed legislation similar to that of Virginia with the 1993 Public-Private Initiatives in Transportation Act. The act created the authority for the Washington State Department of Transportation (WSDOT) to "solicit proposals from

[14] Information regarding the PPTA is contained at: http://www.virginiadot.org/business/ppta-default.asp
[15] Additional information on the Route 288 project is available at: http://www.route288.com/

private companies to plan, design, finance, construct, and operate transportation facilities, and to impose user fees or tolls to recover all or a portion of the cost of the project and to earn a reasonable rate of return on their investment." (Washington State Legislature, 2000). In further modification of the act, the legislature allowed for public opposition to any project to enter into the project planning (the Advisory Election Clause).

*Case Study*

- SR 16/Tacoma Narrows Bridge: One of the first six projects identified by the State as qualifying for the Public-Private Initiatives Act was the State Route 16/Tacoma Narrows Bridge Project. The initial plan for re-construction was to utilize toll revenue from the bridge to finance the project. However a 2000 court decision placed the project on hold citing the fact that the WSDOT did not have the authority to toll the existing bridge. A 2002 legislative decision allowed for tolling on the bridge. This legislative decision also called for an investigation into the structure of public-private partnerships, resulting in the Yarema (2002) article previously cited.[16]

### 2.6.4 Georgia Public Private Initiatives

The 2003 Public Private Initiative (PPI) Legislation, revised in 2005, allows the Georgia Department of Transportation to begin entering into public private partnerships. This legislation allows for solicited proposals (via RFPs) and unsolicited proposals from private entities seeking to improve the transportation infrastructure in Georgia. The first project moving forward in Georgia is the proposed I-75/575 construction, which is included below as a case study (Georgia DOT, 2005).

*Case Study*

- I-75/575 PPI Proposal: The first project to move towards the negotiation phase under the PPI legislation is the addition of managed lanes and bus lanes to I-75 and 575. As of October 2005, the proposal is scheduled for public hearing, which will determine if further negotiation will continue. The proposed project was an unsolicited proposal

[16] Additional information on this project is available at http://www.wsdot.wa.gov/projects/sr16narrowsbridge/

from Georgia Transportation Partners, a joint-venture of construction companies based in Georgia.[17]

### *2.7 Multi-Modal Transportation*

Discussion in the transportation literature indicates that continuing to focus efforts primarily on funding highway infrastructure may not be a long-term sustainable prospect, given the threats to revenue sources, the growing problem of congestion management and the inconsistency of supporting gasoline powered vehicles that are incompatible with existing energy policies. This recognition has led many states to examine multi-modal transit options as a means of addressing transportation needs. Increasingly, states have begun to focus on "transportation's role in achieving such societal goals as efficiency, equity, a sound environment, livability, and a good overall economy" (Pederson, 2000 pg. 2). However, multi-modal and intermodal planning face the challenge that responsibilities for different modes are often held by different state agencies. Successful implementation of multi-modal and intermodal projects requires extensive communication among the relevant state agencies as well as the public.

The Maine Department of Transportation, as noted in Section 2.6.1, has worked to expand transportation options in Maine beyond the roadways. The Office of Passenger Transportation is devoted to exploring transit options in Maine, and to providing information to Maine's residents and visitors regarding the various transit options as evidenced by the Explore Maine website available at www.exploremaine.org.

Continuing efforts to plan multi-modal projects should include review of documented successful projects. Examples of successful planning efforts are noted below.

[17] Additional information on this project is available at http://www.dot.state.ga.us/ppi/index.shtml

*Case Studies*

- Denver's T-Rex Project: A Multi-Modal Project

The Denver I-25 project is a unique example of the ability of collaborative partnerships to combine in an effort to address highway and rail financing in a single multi-modal project. The project, started in 2001, will add 19 miles of light rail alongside the major road corridors of travel into Denver including new stations. The roadway also will be enhanced during this project via added lanes and reconstructed interchanges. In addition, in an effort to encourage bicycle and pedestrian travel, the project will add shoulders to sections of the roadway. A final component of the multi-modal project is a proposed bus service in the southeast metro area (T-Rex, 2005).

- Virginia's Statewide Multi-Modal Long-Range Transportation Plan (Vtrans 2025)

The Commonwealth of Virginia currently is planning a long-range statewide transportation plan entitled *VTrans2025*. The plan is being developed jointly by the four state transportation modal agencies: the Department of Aviation (DOAV), the Department of Rail and Public Transportation (VDRPT), the Port Authority (VPA), and the Department of Transportation (VDOT). A primary element of the *VTrans2025* project is a multi-modal investment network also known as a MIN (VDOT, 2005). Virginia planners envision MINs to be a group of aligned projects. They have classified projects as "anchor projects" and the aligning projects would be "supporting projects". An example of such 'aligned projects' is the Denver T-Rex, where road enhancement is the "anchor project" and the "supporting projects" include the rail system and pedestrian access. Currently the *VTrans 2025* initiative is considering eleven possible project sites including routes from North Carolina to West Virginia such as Interstate 77, Route 52 and Route 100. The *VTrans 2025* initiative is still in the planning phase, but has already developed a working set of criteria for plans to be considered.

## 3.0 Equity and Suitability Considerations

Increasingly, transportation planning must consider not only traditional issues of best practice, financing and safety, but also issues of equity and suitability. As the number of transportation initiatives grows along with alternatives to finance them, more attention must be devoted to determining the suitability of options for a state's specific needs. The alternative financing options presented in this report would have radically different effects on groups within Maine's population. Accordingly, equity and suitability issues should be considered simultaneously with the options presented above. This section

briefly discusses some of the equity and suitability issues that surround transportation planning.

### *3.1 Equity*

An important consideration in transportation decisions and investments is their subsequent effects on diverse economic groups. An example of equity consideration can be seen in the current gas tax. The gas tax often is considered regressive, because lower income populations pay a higher proportion of their income in gas taxes than do higher income populations. In addition, the burden of the gas tax may be disproportionately shifted onto low-income populations who may not be able to purchase the most fuel-efficient vehicles. The lower economic population therefore pays a larger fee. While many consider the gas tax to be a user fee, the current system charges less fuel efficient vehicles a higher fee although they may not create a greater level of damage to the roadways. On the other hand, such vehicles require more fuel and are thus more costly to operate, typically create more pollution than more fuel-efficient vehicles, and are contrary to other environmental and energy policies. Another income related equity consideration is citizen access to work places. A minimal level of access to employment should always be assured. Given the limited mobility choices in rural areas, lower-income workers spend a higher proportion of their income to access employment (Pederson, 2000). Such equity assessments of the distribution of benefits from statewide transportation decisions and investments should be considered as Maine looks ahead in transportation planning.

### *3.2 Suitability and Criteria*

Other states that have begun to tackle some of the same issues as Maine (e.g., declining revenue and purchase power from gasoline taxes and threats to sustainability of transportation infrastructure) have employed a set of evaluation criteria as a means of identifying preferred options (Oregon, 2005). The list of alternative financing options presented in Section 2, and summarized in Table A.3, demonstrates that many of these alternatives, which were designed for major metropolitan areas, may not be suitable for Maine. A combination of some of these suitability issues, as well as the previously mentioned equity issues, should be helpful tools in evaluating the applicability of alternative financing options to Maine. The criteria outlined below are intended to serve as a discussion point for policy makers in identifying such evaluation criteria.

The ability of an option to generate sufficient revenue is an evaluation criterion to consider. To this end, Section 4 of this report projects the revenue that may be raised under a few of the alternative financing options outlined above. Other criteria could address some of the equity issues outlined above. Horizontal equity standards typically dictate that people with equal ability to pay (i.e., similar economic status) should pay equal amounts. In addition, economists typically agree that a user-fee is the most efficient system of fee collection. Thus, another evaluation criterion could be the extent to which the alternative represents a pay-as-you-use standard (i.e., will those who use the system more, pay more?).

A fourth evaluation criterion could address access. This criterion measures the extent to which all citizens will be able to use roadways/transportation modes under a particular financing option. Since many of the alternatives outlined above can be

intended to be long-term replacements for the gasoline tax, a fifth criterion that addresses evasion and enforceability must also be considered. Enforceability may be particularly applicable in efforts to capture revenue from out-of-state travelers. Maine has a large tourism based economy and out-of-state visitors inflict damage to Maine's roadways.

Alignment with existing policy objectives is a sixth evaluation criterion that should be considered. Environmental and energy policies, such as decreasing air pollution and sprawl, increasing mass transit use and non-motorized transportation, are all current policy priorities. Implementation of a financing option which is at odds with existing policy may send confusing signals to citizens. A final criterion for measuring financing options is political feasibility. A summary of these possible evaluation criteria is contained in Table 2.

Table 2. Sample Evaluation Criteria for Financing Options

| | |
|---|---|
| 1 | What is the revenue raising potential of this option? |
| 2 | Will this option meet equity standards (do people with equal ability to pay, pay equally?) |
| 3 | Will this project meet pay-as-you-use standards (i.e. will those who use the system more, pay more)? |
| 4 | Will citizens still be able to use the roadways/transportation mode under this option, even if they have limited financial resources? |
| 5 | Will this option be enforceable and able to capture out of state travelers? |
| 6 | Is this option in alignment with other policy objectives? |
| 7 | Is this option politically feasible? |

## 4.0 Issues in Transportation Policy and Financing

Transportation planning is a complex and evolving field. Many recent energy and environmental initiatives influence nationwide transportation policy and may impact Maine's future fuel tax revenues. This section presents some of the issues that may affect fuel economy and revenues from motor fuel taxes.

With respect to alternative fuel vehicles and hybrids, the Alternative Motor Fuel Act (AMFA) creates a set of incentives that may have long-term impacts on fuel economy and revenue. Currently the AMFA allows flexible fuel vehicles (FFV) to be treated as half gasoline and half alternative fuel, although most vehicles produced in this category are used by consumers as gasoline vehicles. The net effect of this set of regulations is that manufacturers may count the fuel efficiency of flexible fuel vehicles as much higher for CAFE purposes than they are being used. This has had the effect of allowing some vehicle manufacturers to decrease the fuel efficiency of the rest of their fleet, resulting in a larger number of lower fuel-efficient vehicles being available to consumers. Thus, the AMFA inadvertently has provided incentives that allow for decreasing fuel efficiency (NHTSA, 2002). As previously noted, the recent Energy Bill has created some additional incentives for consumers to purchase hybrids. However, many hybrid engines have been employed as a means of increasing performance and not necessarily fuel efficiency. The impact of these incentives on hybrid consumption should be monitored, as well as any subsequent indications that hybrids actually have increased the fuel efficiency of the fleet.

A second issue is the common conception that the fuel economy of the US fleet (and by extension Maine) is increasing, and therefore revenue from motor fuel taxes is

under immediate threat. The U.S. fleet fuel economy actually has been decreasing since its height in 1987-88 (NHTSA, 2002). The model year 2005 light-duty vehicle average fuel economy (21.0 mpg) is five percent lower than the 1987-1988 average but is the highest average since 1996 (Heavenrich, 2005). The fuel economy changes are due partially to the composition of the fleet where light-duty trucks are expected to account for 50 percent of all light-duty vehicles in model year 2005, up from 28% in 1987 (Heavenrich, 2005). Thus, the fleet fuel economy is not necessarily currently increasing, and therefore revenue concerns may not be as immediate as previously anticipated. Recent national transportation policy initiatives will affect future fleet fuel efficiency and should be considered in future efforts to project revenue.

A third important issue is the role that vehicle-miles-traveled plays in transportation revenue. The Federal Highway Administration indicates that, on average, vehicle-miles-traveled has experienced a historical growth rate of 1.7 to 2.6% (2005). The net effect of this VMT increase has been an increase in gas tax revenue. The data analysis presented in Section 5 assumes a constant VMT, and will therefore over estimate the revenue impacts that increasing fuel economy will have.

A final issue to consider is rebound effects. Two rebound effects have been discussed in transportation policy literature: micro and macro. The micro effect also is known as the primary effect, the direct rebound effect, or the take-back effect. The primary effect states that increased fuel efficiency will actually lower the cost of driving for consumers due to lower fuel consumption. If driving a vehicle becomes a cheaper transportation option, rebound effects indicate that consumers will actually drive their passenger vehicles more. While rebound effects are still under discussion by energy

economists, the current estimates range from 10 to 20% (IEA, 2005).[18] That is, raising fuel efficiency by 10% reduces gasoline demand by only 8% to 9% because consumers drive more. The macro effect considers the rebound impact on a larger base. If the cost of driving becomes less expensive, this may increase the competitive nature of Maine industries. The question that remains is whether increasing transportation efficiency (and more competitive industries) will induce enough expansion in GDP to offset the fuel efficiency gain.

Maine transportation planners must continue to monitor the impacts of the Alternative Motor Fuels Act (AMFA) and changes in the CAFE standards and other policies that intentionally increase fuel efficiency and decrease the use of petroleum, but also, inadvertently decrease highway infrastructure revenues.

## 5.0 Data Analysis

### *5.1 Data Sources and Limitations*

This section discusses the sources of data used in the analysis and data limitations. In Section 5.4 we perform detailed data analysis on financing options given these limitations in the data available. We also note instances in which Maine already employs some of the financing options. Appendix Table A.1 identifies the type of data that would be required to perform analysis or revenue projections for all alternative financing options.

Maine vehicle fleet information used in the data analysis was obtained from the Maine Bureau of Motor Vehicles, through Information Resources of Maine (InforME).[19]

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[18] These ranges were determined based on fuel price and fuel economy changes over a 25-year period.

[19] Vehicle data from: Maine vehicle registration records as of 3/31/2005, provided by InforME, http://www.maine.gov/informe/

The data includes all Maine vehicle registrations from 2004 and 2005 as of March 31, 2005. Regrettably, the Maine Bureau of Motor Vehicles and InforME do not maintain electronic files of previous years' registration data, which makes identifying trends and creating projections challenging. Due to the lack of historical Maine data, we also use data from national sources. Every effort has been made to utilize Maine data sources and to note the source of data. In addition, we note data collection and retention procedures as well as research areas that are of high priority for further study.

A key component of the data analysis involved decoding vehicle identification numbers (VIN) to obtain the fuel economy of individual vehicles. The VIN decoding services supplied by ESP Data Solution, Inc., provided fuel economy data.[20] The exact fuel economy of vehicles in the Maine fleet older than model year 1996 was unobtainable. However, the EPA/Mobile6.2 model utilizes fuel economy data for pre-1996 vehicles and this information was applied to vehicles of the Maine fleet older than model year 1996.[21] In an effort to ensure that the nationwide data were compatible with Maine data, a weight was utilized to reflect the difference between Maine and National average fuel economy for each year.[22]

The registration information for heavy-duty vehicles (e.g., vehicles weighing over 8,500 lbs) was contained in the Bureau of Motor Vehicles data. However, the EPA does not regularly test the fuel economy of heavy-duty vehicles and therefore fuel economy could not be obtained by VIN decoding. Thus, a national survey implemented by the

[20] ESP Data Solutions maintains a large database able to match vehicle identification number to manufacturers specifications for a vehicle, including fuel economy estimates from the US EPA. As recommended by the EPA, the fuel economy estimates posted by manufacturers were reduced by 15% to reflect expected on road performance.

[21] Light Duty Fuel Economy Data for Model Years 1996-2005 from: ESP Data Solutions Inc, Lawrence, MA, 2005

[22] EPA Mobile6 model information available from: http://www.epa.gov/otaq/m6.htm. Details regarding the sources of EPA's estimates are available at: http://www.epa.gov/otaq/models/mobile6/p02005.pdf

Bureau of Transportation Statistics was used to determine average fuel economy for heavy-duty vehicles.[23]

An additional component of the data analysis was determination of the vehicle-miles-traveled (VMT) by Maine's vehicle fleet. For light-duty vehicles and heavy-duty pickups and SUV's (i.e., personal vehicles exceeding the 8,500 lbs weight limit) the vehicle-miles-traveled data were obtained from the 2001 National Household Transportation Survey administered by the U.S. Department of Transportation. Other heavy-duty vehicle's vehicle-miles-traveled information is based on a survey conducted by the United States Census, which provides heavy-duty VMT information by state.[24,25]

### *5.2 Maine's Vehicle Fleet*

#### 5.2.1 Maine's Light-duty Vehicle Fleet

In order to obtain an accurate picture of Maine's current vehicle fleet, the Bureau of Motor Vehicles registration data were analyzed by class of vehicle and by fuel type.[26] Figure 2 presents the basic composition of the Maine light-duty vehicle fleet.[27] Light-duty vehicles make up 84% of Maine's total vehicle fleet, and are a crucial component of the revenue base. It should be noted that the type of vehicle and their prevalence within the fleet are important aspects in future efforts to identify how fleet changes will affect revenue.

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[23] Heavy-Duty Fuel Economy from: Tables 4-13 & 4-14, National Transportation Statistics 2005, Bureau of Transportation Statistics, 2005, http://www.bts.gov/publications/national_transportation_statistics/2005/index.html

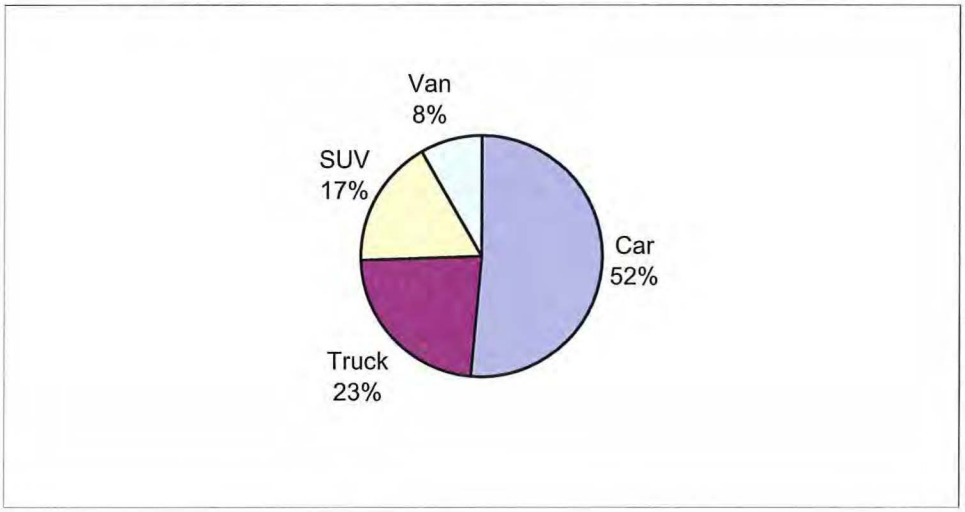
[24] Heavy-Duty Vehicle VMT Data, excluding Buses : Table 3a Maine: 2002 Vehicle Inventory and Use Survy Geographic Area Series, US Census Bureau, 2003, http://www.census.gov/svsd/www/02vehinv.html

[25] Bus VMT Data from: Table 4-15, National Transportation Statistics 2005, Bureau of Transportation Statistics, 2005, http://www.bts.gov/publications/national_transportation_statistics/2005/index.html

[26] Vehicle classification data from: ESP Data Solutions Inc, Lawrence, MA, 2005

[27] Light-Duty Vehicles are defined as vehicle weighing under 8,500 lbs. Heavy-Duty Vehicles are defined as vehicles weighing over 8,500 lbs.

Figure 2. Maine's Light-Duty Vehicle Fleet Composition




Within each class of vehicle, further specific categories were utilized in the analysis. An example is the car class. Within this class there are small, mid-size and large cars, and within each of these categories some vehicles utilize gasoline and some use diesel. Tables 3a-d show the composition of Maine's vehicle fleet by vehicle class and include the percentage of that vehicle type on the road, average vehicle miles traveled, average fuel economy, total vehicle-miles-traveled and total fuel consumption.[28] The data contained in these tables will be used repeatedly throughout the analysis. Section 5.3 examines how changes in the fuel economy of the fleet will impact fuel consumption and revenue. Section 5.4 investigates the revenue ramifications of implementing a distance per-mile charge, which employs the vehicle-miles-traveled data.

[28] Motorcycles and 'Other' unclassified vehicles comprise 7.77% of the total vehicle fleet (i.e. light-duty and heavy-duty). These vehicles will be included in the data analysis but are not included in Tables 3a-d.

Table 3.a Maine's Car Fleet

| VehicleClass | FuelType | Percentage | Avg VMT | Avg MPG | Total VMT | Fuel Consumption (gal) |
|---|---|---|---|---|---|---|
| Large Car | Diesel | 0.0[29] | 6,502 | 28.47 | 104,038 | 3,654 |
| Large Car | Gasoline | 12.69 | 10,638 | 19.48 | 674,429,349 | 34,621,224 |
| Mid-size Car | Diesel | 0.16 | 7,082 | 28.81 | 5,637,319 | 195,693 |
| Mid-size Car | Gasoline | 51.48 | 10,785 | 20.24 | 2,773,833,451 | 137,057,714 |
| Small Car | Diesel | 0.35 | 11,226 | 32.59 | 19,634,191 | 602,401 |
| Small Car | Gasoline | 34.37 | 10,997 | 22.28 | 1,888,279,167 | 84,760,338 |
| Unknown | Diesel | 0.0[30] | 9,908 | 31.39 | 29,725 | 947 |
| Unknown | Gasoline | 0.94 | 10,840 | 20.85 | 50,894,412 | 2,440,731 |
| - | Electric | 0.00 | - | - | - | - |

Table 3.b Maine's Light-Duty Truck Fleet

| VehicleClass | FuelType | Percentage | Avg VMT | Avg MPG | Total VMT | Fuel Consumption (gal) |
|---|---|---|---|---|---|---|
| Large Pickup Truck | Gasoline | 63.40 | 11,918 | 13.50 | 1,685,112,361 | 124,863,707 |
| Small Pickup Truck | Diesel | 0.03 | 2,898 | 25.62 | 179,673 | 7,012 |
| Small Pickup Truck | Gasoline | 34.79 | 11,991 | 16.25 | 930,361,491 | 57,257,351 |
| Unknown | Diesel | 0.02 | 2,898 | 25.62 | 130,408 | 5,090 |
| Unknown | Gasoline | 1.76 | 11,944 | 14.47 | 46,773,356 | 3,232,189 |
| - | Electric | 0.01 | 0 | - | - | - |
| - | NG/Propane | 0.00 | 0 | - | - | - |

Table 3.c Maine's Light-Duty SUV Fleet

| VehicleClass | FuelType | Percentage | Avg VMT | Avg MPG | Total VMT | Fuel Consumption (gal) |
|---|---|---|---|---|---|---|
| Large SUV | Gasoline | 13.14 | 12,359 | 13.02 | 272,314,546 | 20,912,014 |
| Mid-size SUV | Gasoline | 55.38 | 12,776 | 15.02 | 1,186,386,282 | 78,966,237 |
| Small SUV | Gasoline | 31.34 | 12,852 | 17.71 | 675,282,234 | 38,124,378 |
| Unknown | Diesel | 0.00 | - | - | - | - |
| Unknown | Gasoline | 0.13 | 12,745 | 15.60 | 2,701,970 | 173,156 |
| - | NG/Propane | 0.01 | - | - | - | - |

Table 3.d Maine's Van Fleet

| VehicleClass | FuelType | Percentage | Avg VMT | Avg MPG | Total VMT | Fuel Consumption (gal) |
|---|---|---|---|---|---|---|
| Large Van | Gasoline | 17.25 | 11,495 | 13.74 | 159,670,786 | 11,618,683 |
| Mini Van | Gasoline | 82.69 | 12,851 | 16.72 | 855,680,276 | 51,175,553 |
| Unknown | Gasoline | 0.05 | 12,617 | 16.21 | 529,926 | 32,698 |
| - | Electric | 0.01 | - | - | - | - |
| - | NG/Propane | 0.00 | - | - | - | - |

[29] There are 16 vehicles on-road.
[30] There are 3 vehicles on-road.

### 5.2.2 Maine's Heavy-Duty Vehicle Fleet

Maine's vehicle fleet includes 90,674 heavy-duty vehicles, which comprise 8% of the total vehicle fleet (Table 4).

Table 4. Maine's Vehicle Fleet Composition

| Type | Current on Road | | Model Year 2004 | |
|---|---|---|---|---|
| | Count | Percent | Count | Percent |
| Light-duty | 970,797 | 84.35 | 56,962 | 83.87 |
| Heavy-duty | 90,674 | 7.88 | 7,808 | 11.50 |
| Motorcycles | 30,063 | 2.61 | 3,079 | 4.53 |
| Other | 59,418 | 5.16 | 72 | 0.11 |
| **Total** | **1,150,952** | **100.00** | **67,921** | **100.00** |

Under current standards many passenger vehicles qualify as heavy-duty. SUV's and pickup trucks constitute 54% of heavy-duty vehicles in the Maine Fleet (Table 5). A second interesting aspect from a policy and revenue standpoint is that 29% of these heavy-duty passenger vehicles are diesel. This is of interest given that the sale of some diesel-fueled passenger vehicles is currently illegal in the state of Maine (in terms of California emissions standards) and will be until 2007.

Table 5. SUV and Pickup's in Maine's Fleet

| SUV's and Pickup Truck's | | |
|---|---|---|
| Class | Count | % of Class |
| Light-duty | 390,698 | 40.25 |
| Heavy-duty | 48,774 | 53.79 |

### 5.2.3 Maine's Vehicle Fleet by Fuel Type

The extent to which alternative fueled vehicles capture larger portions of the passenger vehicle market may cause a decline in gasoline excise tax revenues. Table 6 documents the type of fuels being used by Maine's vehicle fleet.

Table 6. Fuel Type of Maine Vehicles

| Fuel | Current on Road | | Model Year 2004 | |
|---|---|---|---|---|
| Fuel Type | Count | Percent | Count | Percent |
| Diesel | 44,490 | 4.08 | 3,024 | 4.67 |
| Gasoline | 1,046,944 | 95.91 | 61,725 | 95.30 |
| NG/Propane | 57 | 0.01 | 2 | 0.00 |
| Diesel/NG | 87 | 0.01 | 19 | 0.03 |
| Electric | 43 | 0.00 | 0 | 0.00 |

From a revenue generation perspective, another source of concern is the increase of hybrid and other higher efficiency vehicles into the passenger vehicle market. As shown in Table 7, Maine's hybrid fleet is only 0.13% of total light-duty passenger vehicles. However, these vehicles constituted 0.72% of the model year 2004 vehicles registered in Maine, which may be an early indicator of approaching trends. Section 5.3 addresses the revenue ramifications of changes in fleet fuel efficiency.

Table 7. Hybrid Vehicles in Maine

| Hybrids | | Count | |
|---|---|---|---|
| Make | Model | Total | MY 2004 |
| Toyota | Prius | 797 | 308 |
| Honda | Accord | 14 | 0 |
| Honda | Civic | 278 | 100 |
| Honda | Insight | 91 | 2 |
| Ford | Escape | 38 | 0 |
| **Total** | | **1218** | **410** |
| **% of Light-duty Vehicles** | | **0.13** | **0.72** |

### *5.3 Changes in Fleet Fuel Efficiency*

The objective of this section is to project Maine's revenue from the motor fuel excise tax under various fuel efficiency changes to the vehicle fleet over time. Work by the National Research Council (NRC, 2002) identified packages of existing and emerging technologies for light-duty vehicles that could be introduced over the next 10 to 15 years that would result in fuel economy improvement up to the point where further increases in fuel economy would not be reimbursed by fuel savings. Given a number of important

assumptions, the NRC determined that fuel economy improvements of about 30% are possible by 2015.[31] The break-even fuel economy levels are not recommended fuel economy goals. Rather, they reflect technological possibilities as well as economic realities and assumptions.

However, these fuel economy increases will take an act of Congress to implement. Without Congressional action, current trends in fuel economy show only modest increases in fuel economy due to the phasing in of higher CAFE standards for light-duty trucks (Figure 3). These modest increases in fuel economy will likely yield a constant or slightly decreasing nominal value of future gasoline revenues for Maine. Actual changes in future fuel tax revenue will also depend on changes in the number of miles driven per capita and changes in Maine's population, both in size and demographics. We examine the potential revenue impacts of these modest increases in fuel economy over a twenty-year period (i.e., to 2025). This scenario is entitled 'status quo' throughout the projections.

If, however, Congressional action were to increase fuel economy standards in response to concerns over petroleum dependence or emissions of gasses linked to global warming, this could lead to a substantial increase in the fuel efficiency of the U.S. light-duty vehicle fleet.[32] This would lead to a considerable decrease in motor fuel excise tax revenues for Maine and the nation. To examine the potential impacts of these actions we

[31] As the NRC notes, these break-even calculations depend critically on the assumptions one makes about a variety of parameters including: price of gasoline, number of miles driven, actual on-the-road fuel economy (NRC Table 4.1). Consumers may also choose to purchase greater acceleration, towing capacity, or other vehicle features that work against increased fuel economy.

[32] Actions may include raising CAFE standards or a voluntary agreement similar to that between Canada and vehicle manufacturers associations.

project a possible 5%, 15% and 30% increase in fuel economy for Maine's vehicle fleet over a ten-year period (i.e., to 2015). [33]

5.3.1 Fuel Consumption Projections

As noted above, Maine's revenue stream from the gasoline tax may be threatened by measures taken at the national level to mandate increases in fuel efficiency. This section will identify factors that may increase vehicle fuel economy, and project the potential impacts that increasing fuel efficiency may have on fuel consumption in Maine.

In order to examine the potential impacts of increasing fuel efficiency, data were obtained on the fuel efficiency of vehicles at the national level from 1980 to 2005. As discussed above, we were able to decode fuel efficiency information only for vehicles model year 1996 or newer in the Maine vehicle fleet. Figure 3 shows the fuel efficiency trends both in Maine and nationwide. The vehicle categories are described in Table 8. Figure 3 demonstrates that Maine closely mirrors national fleet fuel efficiency trends.

[33] Efforts to project further into the future are limited in reliability. Extended projections face the limitation of either assuming constant technology or assuming development of new technology and therefore face unknown increases in fuel economy as a result.

Figure 3. Fuel Efficiency Trends

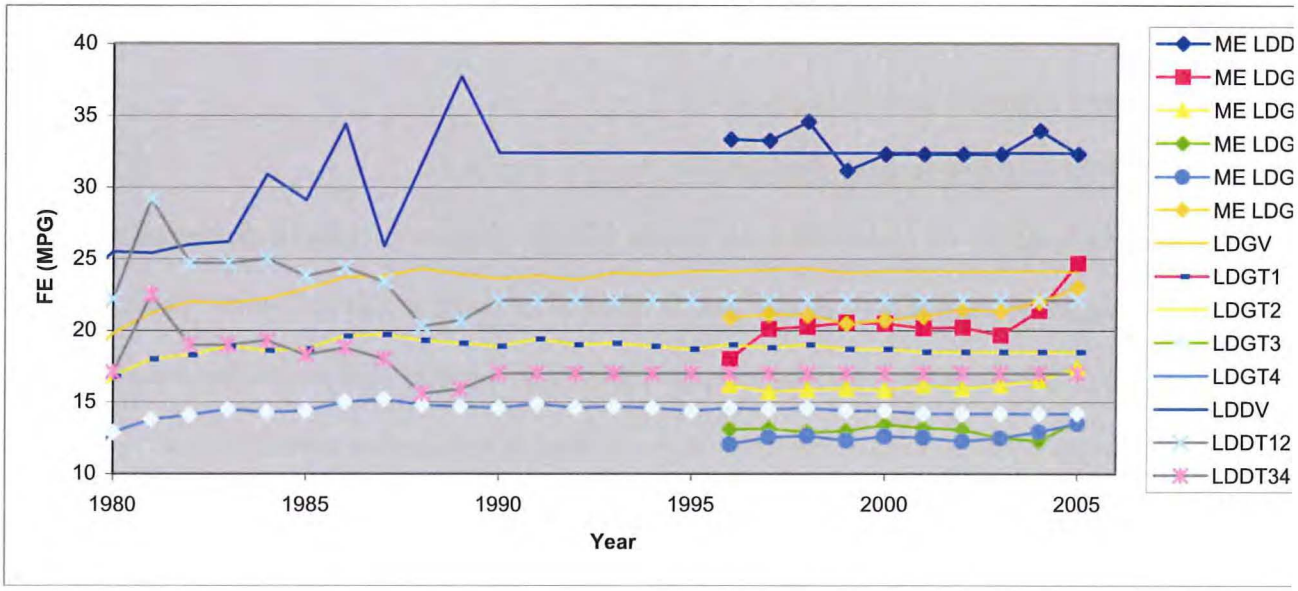



Table 8. Mobile6 Vehicle Classifications

| ***Abbreviation*** | ***Description*** |
|---|---|
| ME LDDV | Maine Fleet of below |
| ME LDGT1 | Maine Fleet of below |
| ME LDGT2 | Maine Fleet of below |
| ME LDGT3 | Maine Fleet of below |
| ME LDGT4 | Maine Fleet of below |
| ME LDGV | Maine Fleet of below |
| LDGV | Light-duty Gasoline Vehicles (Passenger Cars) |
| LDGT1 | Light-duty Gasoline Trucks 1 (0-6,000 lbs. GVWR; 0-3,750 lbs. LVW) |
| LDGT2 | Light-duty Gasoline Trucks 2 (0-6,000 lbs. GVWR; 3,751-5,750 lbs. LVW) |
| LDGT3 | Light-duty Gasoline Trucks 3 (6,001-8,500 lbs. GVWR; 0-5,750 lbs. ALVW) |
| LDGT4 | Light-duty Gasoline Trucks 4 (6,001-8,500 lbs. GVWR; 5,751+ lbs. ALVW) |
| LDDV | Light-duty Diesel Vehicles (Passenger Cars) |
| LDDT12 | Light-duty Diesel Trucks 1 & 2 (0-6,000 lbs. GVWR) |
| LDDT34 | Light-duty Diesel Trucks 3 & 4 (6,001-8,500 lbs. GVWR) |

As noted above, the fleet fuel efficiency gains assumed during the projections may come from a variety of sources including changing national regulations regarding efficiency standards, increases in the price of motor fuels, and a growing market-share of hybrid vehicles and/or diesel fueled vehicles. This market share may experience more

rapid growth than initially anticipated by market analysts due to federal tax credit purchase incentives.[34]

A second possible impetus for change in fuel efficiency stems from the role of diesel fueled vehicles, particularly with respect to changing Maine state law. The state will allow the sale of diesel passenger vehicles in Maine in 2007. As shown in Figure 3, diesel vehicles of the same class achieve higher average fuel economy. Additional evidence of this can be seen in the car class data (Table 3.a). Gasoline fueled cars achieve an average fuel economy of 20.6 miles per gallon. In contrast, diesel fueled cars achieve an average fuel economy of 29.95 miles per gallon. Diesels also may be experiencing a nationwide trend of increasing market share. In 2002, light-duty diesel vehicles comprised 2.2% of the market and accounted for 2.9% in 2004. In addition, more automakers are offering diesel models in the United States. In 2004, eleven diesel models were available in the United States. This number has grown to fourteen models in 2005 (Welsh, 2005).

As previously discussed, changing national regulations also may factor into the future fuel economy of Maine's vehicle fleet. Announced in August 2005 Reformed CAFE standards, an update to the current CAFE standards, would increase fuel economy across all vehicle types. The current standards for light-duty trucks are 21 miles per gallon in 2005 with an increase in fuel efficiency to 22.2 miles per gallon for model year 2007 (NHTSA, 2005). To the extent that efficiency increases are not offset by increased driving, the revenue stream from motor fuel excise taxes could decline in nominal terms

[34] Citizens purchasing a hybrid vehicle of market year 2001 or newer (of certain makes and models), are eligible to receive a $2000 dollar tax credit if these vehicles are registered by December 31, 2005. The tax credit structure will be changing in 2006 but may still offer tax credits to consumers who purchase hybrid vehicles. Information available at: http://www.fueleconomy.gov/feg/tax_hybrid.shtml

in addition to their decline in real purchasing power due to the effects of increases in inflation.[35] The potential impact on revenue streams due to the new CAFE standards are included in the status quo projections presented below.

The analysis presented here is based on a number of assumptions. First, we assume that the fuel economy of the newest model year increased by 5%, 15% or 30% by the year 2015. Thus we assume an incremental increase in fuel economy for all years between the base (2005) and the final (2015) year. We assume a constant rate of replacement (i.e., the fleet does not grow) and that the composition of the fleet remains constant. We assume the vehicle-miles-traveled was constant.[36] In addition, since the data spanned two years and new tax rates are effective as of July 1, we employ a mix of the 2004 and 2005 tax rates.[37] Thus, revenue projections are in 2005 dollars and are based on the percent change in miles per gallon and subsequent change in fuel consumption, but do not account for increases in miles traveled. The effect of increasing vehicle-miles-traveled is discussed at the end of this section.

In the case of a 5% increase in fuel efficiency between 2005 and 2015, the projections assume a 0.5% increase in fuel efficiency in each year of the ten-year span.[38] Given the example of Maine's mid-size gasoline cars that achieve on average 20.24 miles per gallon and travel collectively 2,773,833,451 miles per year, this produces a fuel consumption rate of 137,057,714 gallons for the year 2005 using Equation 1.

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[35] National statistics indicate a trend of increasing vehicle miles traveled however, Maine Department of Transportation traffic count data from 2004 indicates that Maine vehicle miles traveled may be decreasing.
[36] As noted in Section 4, the historical rate of VMT growth nationally is 1.7 to 2.6%.
[37] 2004 tax rate of .252 and 2005 tax rate of .259 for gasoline and diesel rates of .263 and .270.
[38] Due to recently released CAFE standards for upcoming model years, the increase in fuel efficiency per year for the overall fleet was adjusted to .0003 for this scenario. Similar adjustments were made for the 15 and 30% increases.

*Equation 1*: Fuel Consumption = $\frac{\text{Vehicle-miles-traveled Annually}}{(1 + \% \text{ change in yearly fuel efficiency} * 20.24)}$

Under a 5% increase in fuel efficiency, fuel consumption in Maine's mid-size gasoline cars would decrease to 137,022,635 gallons in the year 2006, or a 0.03% change in fuel consumption. By 2015, the fuel consumption for this category of car would decrease to 135,154,669 gallons per year, a 1.39% decrease from 2005 as shown in Table 9. Continuing with the same example of Maine's mid-size gasoline cars under a 15% and 30% increase in fuel efficiency, the fuel consumption in 2015 would decrease by 4.50% (to 131,502,839 gallons) and 7.79% (to 126,380,698 gallons) respectively (Table 9). This example clearly demonstrates that changes in fuel efficiency can have a rapid, and profound effect on fuel consumption. The example analysis given above was performed for each vehicle class (and category within class) for both diesel and gasoline vehicles in order to generate the revenue estimates discussed in Section 5.3.2.

As previously mentioned in this report, the assumption of constant vehicle-miles-traveled may overstate the decrease in fuel consumption. Applying the national VMT growth rate trend of 2% annually to the 5% change in fuel economy projections results in 40% of the anticipated decline not materializing due to increasing vehicle miles traveled.[39]

[39] In the 15 and 30% fuel economy increase scenarios, the decrease in fuel consumption is over stated by 13 and 6%, respectively.

Table 9. Fuel Consumption Projections: Mid-Size Cars
% Change in Fuel Economy from 2005 to (2006-2015)

| | 5% | | 15% | | 30% | |
|---|---|---|---|---|---|---|
| | *Gallons* | *% Change*[40] | *Gallons* | *% Change* | *Gallons* | *% Change* |
| 2006 | 137,022,635 | -0.03% | 136,952,531 | -0.08% | 136,847,509 | -0.15% |
| 2007 | 136,952,531 | -0.08% | 136,742,648 | -0.23% | 136,429,027 | -0.46% |
| 2008 | 136,847,509 | -0.15% | 136,429,027 | -0.46% | 135,806,081 | -0.91% |
| 2009 | 136,707,730 | -0.26% | 136,013,097 | -0.76% | 134,984,283 | -1.51% |
| 2010 | 136,533,407 | -0.38% | 135,496,737 | -1.14% | 133,970,916 | -2.25% |
| 2011 | 136,324,806 | -0.53% | 134,882,257 | -1.59% | 132,774,780 | -3.12% |
| 2012 | 136,082,242 | -0.71% | 134,172,370 | -2.11% | 131,406,006 | -4.12% |
| 2013 | 135,806,081 | -0.91% | 133,370,166 | -2.69% | 129,875,847 | -5.24% |
| 2014 | 135,496,737 | -1.14% | 132,479,076 | -3.34% | 128,196,463 | -6.47% |
| 2015 | 135,154,669 | -1.39% | 131,502,839 | -4.05% | 126,380,698 | -7.79% |

### 5.3.2 Revenue Projections

In this section the change in fuel consumption generated in Section 5.3.1 is translated to revenue impacts. Given that gasoline and diesel fuel are assessed different taxation rates, the data were divided by fuel type in order to continue the analysis. For each year, the total fuel consumption projections for all vehicles of one fuel type were summed. For example, the 2006 fuel consumption projections for all gasoline vehicles were summed to 701,318,005 total gallons of gasoline consumed. Since gasoline taxes are effective as of July 1, the 2004 gasoline tax was in effect for six months of 2005 and the 2005 gasoline tax was in effect for the second sixth months of 2005, the per gallon gasoline tax applied for the revenue projections was an average of the two tax rates.[41] The steps outlined above for calculating total fuel consumption and taxation rate was repeated for all diesel vehicles. To complete the analysis, these two projections were summed to provide total revenue estimates under the fuel economy scenarios outlined

[40] To calculate total percent change between each year and the base year of 2005 the following equation was used: (gallons consumed in [YEAR] – gallons consumed in 2005)/gallons consumed in 2005.
[41] Gasoline Tax for 2005 = (.252+.259)/2 = .2555. Diesel Tax 2005 = (.263 + .27)/2 = .2665

above. The impact on revenue from changing fuel economy is shown in Figure 4. The data used to create Figure 4 are contained in Table 10 for reference.

Absent changes in national transportation policy or changes in consumer behavior, these increases in fuel efficiency may not occur. The revenue estimate under status quo assumptions is $214 million for 2015, representing a 2.53% decrease in revenues. Extending the status quo projection to 2025 yields a revenue projection of $209 million representing a modest 5.03% decrease in revenue from 2005.

Figure 4. Maine Fuel Tax Revenue Projections: Change in Fleet Fuel Efficiency

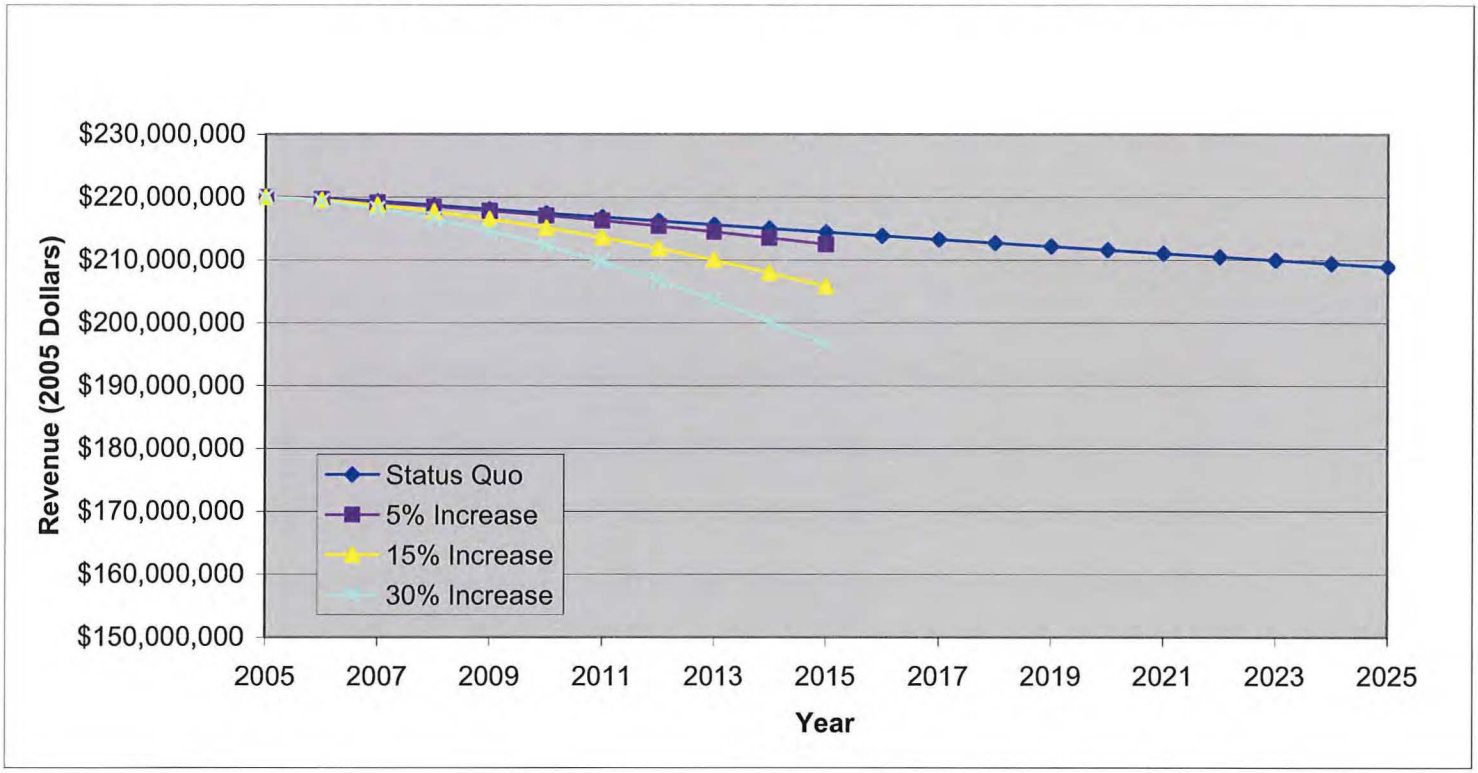

Table 10. Total Revenue Impacts[42]

| | Status Quo | | 5% | | 15% | | 30% | |
|---|---|---|---|---|---|---|---|---|
| | *Revenue* | *% Change* | *Revenue* | *% Change* | *Revenue* | *% Change* | *Revenue* | *% Change* |
| 2006 | $219,771,139 | -0.10% | $219,703,607 | -0.13% | $219,568,672 | -0.19% | $219,366,590 | -0.28% |
| 2007 | $219,339,959 | -0.29% | $219,138,435 | -0.39% | $218,736,531 | -0.57% | $218,136,520 | -0.84% |
| 2008 | $218,699,877 | -0.59% | $218,511,546 | -0.67% | $217,714,455 | -1.03% | $216,529,998 | -1.57% |
| 2009 | $218,067,690 | -0.87% | $217,824,159 | -0.98% | $216,508,323 | -1.58% | $214,564,993 | -2.47% |
| 2010 | $217,443,250 | -1.16% | $217,077,579 | -1.32% | $215,124,876 | -2.21% | $212,262,679 | -3.51% |
| 2011 | $216,826,418 | -1.44% | $216,273,197 | -1.69% | $213,571,616 | -2.92% | $209,646,884 | -4.70% |
| 2012 | $216,217,055 | -1.71% | $215,412,476 | -2.08% | $211,856,716 | -3.70% | $206,743,505 | -6.02% |
| 2013 | $215,615,025 | -1.99% | $214,496,951 | -2.50% | $209,988,918 | -4.55% | $203,579,919 | -7.46% |
| 2014 | $215,020,198 | -2.26% | $213,528,221 | -2.94% | $207,977,424 | -5.46% | $200,184,406 | -9.00% |
| 2015 | $214,432,445 | -2.53% | $212,507,942 | -3.40% | $205,831,799 | -6.44% | $196,585,607 | -10.64% |

It is clear from the revenue projections above that concerns of decreasing fuel tax revenue due to changes in fuel economy are well founded. Section 2 of this report discussed possible alternatives to supplement, or replace, the revenue obtained from fuel taxes. Forecasts regarding the possible revenue obtained from these alternatives are discussed in Section 5.4.

### *5.4 Alternative Financing: Tax Revenue under Distance Based Charges*

In Sections 2.3.3 and 2.5.1, two alternative financing options were presented that centered on varying costs to drivers depending on the vehicle miles traveled. Section 2.3.3 described systems of distance-based charges that track a driver's mileage, some via electronic tracking systems. Section 2.5.1 discussed varying registration fees based on vehicle-miles-traveled from odometer readings. As both options are mileage based, the following analysis can be useful in considering the revenue possibilities of these options.

[42] To calculate total percent change between each year and the base year of 2005 the following equation was used: (revenue in [YEAR] – revenue in 2005)/revenue in 2005.

Using data from the Maine Revenue Service, the revenue obtained from the gasoline tax in 2004 was $175,970,766. A second category of 'Special Fuel' tax, which includes diesel fuel taxes, garnered revenue in the amount of $40,391,130.[43] Collectively, these two taxes amounted to $216,361,896 in 2004 revenue. Based on the stated assumptions regarding the rate of taxation for diesel and gasoline for the 2005 fiscal year, the estimated 2005 tax revenue for Maine was calculated to be $219,988,083.

In order to maintain this level of revenue using a mileage-based charge instead of a state gasoline tax, the charge required is 1.74 cents per mile traveled. This rate was calculated using the data contained in Table 11. For comparison purposes, the per-mile charge currently used by the Oregon Road User Fee Task Force pilot program is 1.22 cents per mile traveled.

Table 11. Expected Revenue from Mileage Charge at 1.74 cents per mile

| **Expected Revenue** | | | | |
|---|---|---|---|---|
| Fuel Type | Total VMT | Fuel Consumption | Fuel Revenue | VMT Revenue |
| Gasoline | 11,851,800,308 | 702,400,273 | $181,921,671 | $206,221,325 |
| Diesel | 781,080,603 | 112,456,657 | $30,363,297 | $13,590,802 |
| Total | 12,632,880,911 | 813,774,663 | $212,284,968[44] | $219,812,128 |

To compare equity in terms of burden of cost between the fuel tax and per-mile charge alternatives, we performed analysis at the aggregate level. Tables 12 and 13 demonstrate that under the current fuel tax system, drivers of light-duty vehicles pay 79% of the revenue generated from the gas tax. Under a vehicle-miles-traveled (VMT)

[43] Revenue information obtained from www.maine.gov/legis/ofpr/04compendium/c04opf1.htm. The "Special Fuel" tax provisions apply to: diesel, propane, methanol, ethanol and compressed natural gas per www.maine.gov/revenue/fueltax/Tax%20Rates.html

[44] This does not account for the 5.16% of the vehicle fleet classified as "unknown". "Unknown" vehicles were unable to be decoded typically due to older makes/models or error in the data. The revenue projections in Section 4.3 include these "unknown" vehicles.

charge, which assumes a constant rate of VMT for both light-duty and heavy-duty vehicles, light-duty vehicles would pay 89% of the revenue generated. In order for light-duty vehicles to pay 79% of the revenue, an adjusted charge (1.49 cents per mile) would need to be implemented. Similarly, in order for heavy-duty vehicles to maintain 21% of the revenue, would require and adjusted charge of 3.3 cents per mile for heavy-duty vehicles. Further analysis of appropriate per-mile charges would be required to adjust the burden of payment. Additional analysis also could consider the impacts, in terms of both revenue and the competitiveness of Maine's industries, of imposing higher mileage charges on heavy-duty vehicles given that HGV's typically create greater damage to roadways.

Table 12. Division of Payment under Fuel Tax

| **Revenue Division** | | | | |
|---|---|---|---|---|
| | Fuel Consumption | Fuel Rate | Fuel Revenue | Percent Paid |
| Light-duty | 646,050,771 | 0.259[45] | $167,327,150 | 79% |
| Heavy-duty | 166,762,630 | 0.2664[46] | $44,425,565 | 21% |
| Total | | | $211,752,714 | 100% |

Table 13. Division of Payment under Vehicle-miles-traveled Charge

| **Revenue Division** | | | | |
|---|---|---|---|---|
| | VMT | VMT Rate | VMT Revenue | Percent Paid |
| Light-duty | 11,227,964,962 | $0.0174 | $195,366,590 | 89% |
| Heavy-duty | 1,351,654,848 | $0.0174 | $23,518,794 | 11% |
| Total | 12,579,619,811 | | $218,885,385 | 100% |

[45] This rate is based on the fact that 99.9% of the light-duty vehicle fleet are gasoline fueled vehicle. Thus the 2005 gasoline tax rate was applied.

[46] This rate is a weighted average based on the fact that 67% of the heavy-duty vehicle fleet are diesel fueled vehicles, while only 33% are gasoline fueled. The weight applied was [(.259*.33) + (.27*.67)].

## 6.0 Results, Implications and Future Research

### *6.1 Results and Implications*

A result called for by the Maine Department of Transportation in commissioning this work was to begin building "a body of information that considers (revenue) alternatives within the economic context of Maine" (ME DOT, 2005(b)). The literature review section is a first step in this process of identifying and providing information on existing alternative financing options prevalent in the transportation literature and in use internationally. For each alternative, the benefits and concerns are identified and, when possible, reviewed with an eye towards the needs of Maine. The literature review section also identifies case studies of alternative financing options currently being employed by other states or nations. These case studies further contribute to the base of knowledge regarding alternative options. In addition, these case studies provide information for Maine policy planners to discuss experiences with other states or nations utilizing alternative funding options, particularly with regard to transitioning from a motor fuel tax program.

Determining the alternative funding options most appropriate for Maine is properly left for the State Legislature, the Governor and appropriate state agencies and the public. However, it is evident that many of the alternatives discussed in the literature review may not be preferred given Maine's economic and geographic circumstances (Table A.3). Accordingly, Section 3.2 (Table 2) presents possible criteria for evaluating alternative-financing options to address Maine's specific needs. The literature review and suggested evaluation criteria provide stakeholders much of the information necessary for informed discussion on the future of Maine's transportation financing.

The data analysis results further contribute to such discussions. First, the analysis demonstrates that fears regarding diminishing revenues due to changes in fuel efficiency are well founded. If steps are taken at the national level to increase fuel efficiency, Maine could experience a decrease in revenue of up to 10% in the next ten years. However, absent changes in national transportation energy policy or changes in consumer behavior, these increases in fuel efficiency may not occur. The revenue under status quo assumptions represents a modest 5.03% decrease in revenue in the next twenty years. The information provided on the types of vehicles that comprise Maine's vehicle fleet will better enable policy makers to consider issues of equity and tax burden when considering financing options. In addition, the data analysis demonstrates how an alternative-financing option could generate revenue that is equal to or greater than current gas tax revenue.

### *6.2 Future Research*

As discussed in Section 5.1, a focus of future research should be to obtain and utilize more comprehensive vehicle data. First, we recommend that the Bureau of Motor Vehicles, through InforME, maintain electronic records of prior vehicle registration data so that an historical electronic archive can be developed going forward. Such data will provide an accurate picture of the Maine vehicle fleet and will allow for statistically stronger analysis of trends across time. In addition, these data will allow Maine to generate information specific to the state, without having to rely on national data. A second focus of future research should be the collection and use of the type of data presented in Table A.1. Such data can be used to determine the revenue impacts of other alternative financing options.

This report presents a firm foundation for future studies related to the role that alternative funding mechanisms may play in supporting Maine's transportation infrastructure. Future research should continue to monitor the successes and failures of currently employed alternative funding mechanisms.

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**Table A.1 Data Limitation or Requirements**

| *Section* | *Alternative* | *Limitation/Requirements* |
|---|---|---|
| 2.2.1 | Alternative Gas Tax Structure | Maine already employs alternative gas tax structure via inflation index. |
| 2.2.2 | LOTT: Natural Resource Extraction | Require data on natural resource extraction activities, and use of rural roadways by industry. |
| | LOTT: Payroll Tax | Require data regarding urban employment |
| | LOTT: Sales Tax | Require data regarding volume of sales in Maine. |
| 2.2.3 | Taxation of Alternative Fuel Source | Maine already employs an alternative fuel tax |
| 2.3.1 | Area Charging/Cordon | Require Data on traffic flow into major metropolitan cities[47] |
| 2.3.2 | Congestion Pricing | Require data on congestion experienced in areas of Maine. |
| 2.3.3 | Distance Based Charges | Data Analysis Component |
| 2.3.4 | HOT Lanes | Require data regarding areas with infrastructure capacity for HOT's |
| 2.3.5 | Value Capture | Require data on development of new roads, and anticipated maintenance cost of these roads. |
| 2.4.1 | Facility Tolls/Facility Congestion Tolls | Maine currently employs facility tolls along the Maine Turnpike and for Ferry Service.<br>Require data on vehicles passing through various tolling facilities and congestion experienced at these facilities. |
| 2.4.2 | Weight Distance Tolls | Maine implements a modified version of this option, as tolling along the Maine Turnpike is dependant on number of axles of a vehicle.<br>Require data on distance traveled by HVG's in Maine. |
| 2.5.1 | Distance Based Fees | Data Analysis Component |
| 2.5.2 | Environmental Emissions Fees | Require Data on the emissions scores of Maine's vehicle fleet[48] |
| | Fuel Efficiency Fee | Changes in fuel economy, are considered in the data analysis as fuel economy applies to the gas tax. |

[47] This type of data may currently be available from the Maine Department of Transportation at http://www.state.me.us/mdot/traffic-counts/traffic-monitoring.php

[48] This information could be extrapolated by applying the Environmental Protection Agency's air pollution score and/or greenhouse gas score to individual vehicles in Maine's vehicle fleet. It should be noted that these scores are only available for Model Year 2000 vehicles or newer.

**Table A.2 Local Option Transportation Tax use in the United States**

| *State Name* | *Type of LOTT Employed* |
|---|---|
| Alabama | Fuel Tax, Sales Tax |
| Alaska | Fuel Tax, Vehicle Tax |
| Arizona | Sales Tax |
| Arkansas | Sales Tax |
| California | Vehicle Tax, Sales Tax |
| Colorado | Vehicle Tax, Sales Tax |
| Connecticut | Vehicle Tax |
| Florida | Fuel Tax, Sales Tax |
| Georgia | Sales Tax |
| Hawaii | Fuel Tax, Vehicle Tax |
| Idaho | Vehicle Tax |
| Illinois | Fuel Tax, Sales Tax |
| Indiana | Vehicle Tax |
| Iowa | Sales Tax |
| Kansas | Sales Tax |
| Louisiana | Sales Tax |
| Minnesota | Sales Tax |
| Mississippi | Fuel Tax, Vehicle Tax |
| Missouri | Vehicle Tax, Sales Tax |
| Nebraska | Vehicle Tax |
| Nevada | Fuel Tax, Sales Tax |
| New Mexico | Sales Tax |
| New York | Sales Tax |
| North Carolina | Sales Tax |
| Ohio | Vehicle Tax, Sales Tax |
| Oregon | Fuel Tax |
| South Carolina | Vehicle Tax, Sales Tax |
| South Dakota | Vehicle Tax |
| Tennessee | Vehicle Tax, Sales Tax |
| Texas | Vehicle Tax, Sales Tax |
| Utah | Sales Tax |
| Virginia | Fuel Tax |
| Washington | Vehicle Tax, Sales Tax |

Data obtained from Goldman and Wachs, 2003. Tables 1, 2, 3a and 3b.

**Table A.3 Literature Review Findings**

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| *2.2* | | | ***Taxes*** | |
| 2.2.1 | Alternative Gas Tax Structure | Indexing gas tax rates to a measure of inflation. | 1) Avoid politically charged situation of increasing tax rate<br>2) Maine currently uses an alternative gas tax structure | 1) Gasoline taxes are regressive (shift tax burden to the poor & middle class) |
| 2.2.2 | Local Option Transportation Taxes | Implementation of a tax at the local level. Earmark revenue for transportation. | | |
| | *Fuel Tax* | Percentage tax on gasoline sales. Revenue earmarked for transportation. | 1) Easily administered by local officials and local control of revenue<br>2) Local drivers are the source of revenue | 1) Jeopardize competitiveness of local businesses<br>2) Limited tax base therefore high rate would be required to raise revenue<br>3) Possible revenue decline over time given increasing fuel economy |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| | *Sales Tax* | Implementation of a sales tax at local or state level. Earmark revenue for transportation. | 1) Broad tax base<br>2) High revenue for low marginal tax rate; less objectionable to consumers<br>3) Complies with horizontal equity (all transportation users pay)<br>4) Direct voter involvement in implementing and maintaining tax<br>5) Revenue obtained from non-residents | 1) Possible revenue instability during recessions<br>2) No incentives for decreasing use of the transportation infrastructure<br>3) Possibly jeopardize competitiveness of Maine businesses |
| | *Other: Natural Resource Extraction* | Levy weight-based charge on natural resource extraction. | 1) Finance rural roads used only by natural resource industries | 1) Jeopardize competitiveness of resource based businesses<br>2) Roads often privately owned by natural resource industries. |
| | *Other: Payroll Tax* | Levy tax on businesses to finance transit. | 1) Finance urban transit systems | 1) Possibly inappropriate for Maine's rural makeup |
| 2.2.3 | Taxation of Alternative Fuels | Levy tax on alternative fuels such as natural gas. | 1) Maine currently taxes alternative fuels | 1) Limited market penetration of alternative fuel vehicles |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| *2.3* | | | ***Road/Direct Pricing*** | |
| 2.3.1 | Area Charging/ Cordon | Implement charge for operating vehicle in specified area. | 1) Promote efficient transportation behavior (carpooling, mass transit)<br>2) Consistent with other policy objectives (reduction of pollution, road wear, noise, etc.)<br>3) Large revenue base if implemented in large area | 1) Possible encouragement of sprawl<br>2) Creation of boundary effects; motorists increase travel in order to avoid charge |
| 2.3.2 | Congestion Pricing | Implementation of variable prices dependant upon time of travel and level of congestion. | 1) Reduction in congestion<br>2) Promote efficient transportation behavior (carpooling, mass transit) | 1) Possible public opposition to fee implementation at previously free area |
| 2.3.3 | Distance Based Charges | Implement variable vehicle user fee dependant upon distance traveled (i.e. per-mile charge). | 1) Stable revenue, not affected by fuel economy<br>2) Promote efficient transportation behavior (carpooling, mass transit)<br>3) Gradual implementation possible; lower public resistance | 1) Implementation of viable technology on a wide scale<br>2) Invasion of motorist privacy<br>3) Evasion of tax<br>4) Possible shifting of burden to rural areas<br>5) Capturing revenue from out of state travelers |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| 2.3.4 | Managed Lanes/ Value Pricing | Vary price of lanes dependant upon time of day and level of congestion. | 1) Present options to motorists; allow motorist to value own time<br>2) Congestion Management | 1) Decrease amount of infrastructure available to the general public |
| 2.3.5 | Value Capture | Require private developers to pay for maintenance of roads created. | 1) Local and State agencies no longer fiscally responsible for privately created roads | 1) Public safety (will developers maintain road consistent with standards of public agencies). |
| ***2.4*** | | | ***Tolls*** | |
| 2.4.1 | Facility Congestion Tolls | Implementation of variable user fees at specific facilities (ex: bridge), dependant upon congestion level. | 1) Promote efficient transportation behavior (carpooling, mass transit)<br>2) Reduce congestion | 1) Equity – fees may be used to finance projects not related to the tolled facility.<br>2) Tolls are regressive (shift payment burden to the poor & middle class) |
| 2.4.2 | Weight-Distance Tolls/Tax | Heavy goods vehicles must pay facility toll or per mile rate based on weight. | 1) Heavy goods vehicles pay commensurate with amount of damage inflicted on roads.<br>2) Captures value of roadways as 'warehouses' for commercial goods | 1) Possible jeopardy to Maine's trucking reliant industries |

| Section of Report | Alternative Financing Option | Definition | Benefits | Concerns |
|---|---|---|---|---|
| *2.5* | | | *Fees* | |
| 2.5.1 | Distance Based Fees/ Price Variability | Replace currently fixed price of vehicle ownership with variable price (ex: variable registration fee based on vehicle miles traveled). | 1) Motorists able to control own savings/costs by adjusting driving habits<br>2) Consistent with other policy objectives (reduction of pollution, road wear, etc.) | 1) Evasion |
| 2.5.2 | Emissions Fees | Levy variable user fees dependant upon vehicle energy efficiency and environmental emissions. | 1) Consistent with other policy objectives (reduction of pollution)<br>2) Promote citizen awareness of vehicle emissions | 1) Availability of information on emissions of all vehicles makes/models. |

# Attachment B

## The Transportation Funding Crisis: Tolls are the Answer

# The Transportation Funding Crisis: Tolls are the Answer


Prepared by the Maine Turnpike Authority
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Traditional funding options, including federal, state and local gas taxes; vehicle taxes and fees; and tax increases can not cover the soaring costs of road and bridge repair, maintenance and the building of new transportation infrastructure. These factors are making toll roads more attractive.

The nation is in the midst of a transportation infrastructure crisis that has given rise again to tolling as lawmakers look for revenue streams that are fair and dynamic to fix aging roads and deal with explosive traffic volumes. Tolls are making a comeback as a reinvented transportation infrastructure funding source and as a strategy for managing congestion. Not since the 1950s, when the Federal Interstate Program began, have tolls been in such demand. Throughout the early 1900s tolls were seen as a funding mechanism that provided stability and fairness. Many of the large bridges in this country were constructed as toll bridges. Some of the precursors to the Interstate System such as the Pennsylvania Turnpike, Maine Turnpike, New Jersey Turnpike and the New York Thruway were constructed as tollways.

A toll is a user fee. A toll is only collected from the drivers that use a facility. Drivers who do not want to pay the toll usually have the option of not using the facility. This makes tolls a fair assessment. Importantly, stand alone toll facilities require sufficient traffic and toll rates to support the construction maintenance and operation of the facility.

### Conventional Tolls

More than 50 toll facilities operate in 34 states and more states continue to explore toll programs. Tolls are used on roadways, bridges, and tunnels to fund all or part of the planning, design, construction, as well as operations and maintenance. States that have recently created new public or private toll authorities are as follows:

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|---|---|---|---|
| Alaska | California | Colorado | Florida |
| Louisiana | Minnesota | North Carolina | South Carolina |
| Texas | Virginia | Washington | |

Arkansas, Missouri, and Utah are considering creating toll authorities.

While traditional toll collection in the past required toll plazas, new technology such as electronic toll collection (ETC) allows drivers to pass through toll collection points without stopping or even slowing down. ETC is making tolls more appealing to federal, state and municipal leaders. At least 20 states currently use some form of electronic toll collection (ETC). The ease of ETC has changed the public's perception of toll roads and has allowed for increased flexibility.

## HOT Lanes

ETC also allows for the construction of "Managed Lanes". The Texas Department of Transportation defines Managed Lanes as "One that increases freeway efficiency by packaging various operational and design actions. Lane management operations may be adjusted at any time to better match regional goals." An example of a Managed Lane is a HOT (high-occupancy/toll) Lane. "The HOT networks concept, proposed in a 2003 study of the Reason Public Policy Institute, is an example of an incremental approach to expanded use of tolls for finance and facilities management (Poole and Orski 2003). The authors call for development of networks of HOT lanes on limited-access expressways in congested urban areas. The lanes would be open toll-free to multioccupant vehicles (as are today's HOV lanes) and to single-occupant vehicles paying a toll. Toll collection would be electronic, and the fare would be varied according to actual traffic conditions to maintain freely flowing traffic at all times. The lanes also would be open to express buses to provide low-cost, high-speed public transit. Development of the system would start with existing infrastructure by converting existing HOV lanes to HOT lanes, and additional mileage of lanes and interchanges would be added to create a rational network in each metropolitan area."[1]

FHWA approval is required for tolling interstate, however, according to the U.S. Federal Highway Administration; the Bush administration wants more states to consider HOT lanes as a funding option.

HOT lanes require fully electronic open road tolling, congestion in free lanes, and dynamic/variable pricing to maintain free flow. Some states allow vehicles with just one occupant to use the lane if they pay a premium toll. In addition, public perception and enforcement is often problematic. Current operating HOT lanes are SR 91, Orange County, CA; I-15, San Diego, CA; and Katy Freeway (I-10), Houston, TX. Poll data indicates a 75% public approval rating of SR-91 and an 80% approval rating of I-15.

The Capital Beltway in Virginia is the site of one of the most innovative public-private partnerships in the country that will bring HOT lanes to a 14-mile segment of this major corridor between the Springfield Interchange and the Dulles Toll Road. The $900 million project, which will be paid for primarily by high occupancy toll (HOT) lane revenues, is the result of a comprehensive agreement between the Virginia Department of Transportation, Fluor Enterprises, Inc., and Transurban (USA) Inc. The agreement enables the construction project to move forward faster, and the state bears no financial risk in the HOT lane construction and operation. Transurban will invest at least 15 percent of the cost to build the HOT lanes.

Additional HOT lanes are being studied in Washington,, Colorado, California, Texas, Florida, North Carolina, Oregon, and Minnesota. http://www.fhwa.dot.gov/policy/otps/projectlist.htm has the latest list of HOT-lane conversions.

## Truck Only Toll Lanes

Truck only toll lanes may also be feasible on routes with heavy truck traffic. This has both operational and fiscal advantages. Operations can improve due to the increased safety associated with the separation of trucks and cars while trucking efficiency can improve if longer and heavier trucks are allowed on the truck only roadway. Truck only facilities have been studied in Virginia, California, and Texas.

Truck only toll lanes are currently in use on the New York State Thruway.

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[1] Transportation Research Board, Special Report 285, The Fuel tax and Alternatives for Transportation Funding, Page 5-4

**Regional Toll Authorities**

Several states have laws that allow for a public entity such as Cities and Counties to construct and operate toll roads. Regional toll roads currently operate in Florida (Miami, Orlando, Kissimmee, and Tampa) as well as Colorado.

The State of Texas recently passed legislation which integrates the use of toll roads and debt finance as major components of the Texas state transportation program. "The new law authorized creation of county-level or multicounty toll road authorities, called regional mobility authorities (RMAs). RMAs must work with the existing metropolitan planning organizations, which retain authority over planning transportation development in their local areas. The goal of the RMAs is to give metropolitan areas greater control over development of their highway systems and to accelerate projects that would not receive high priority in the statewide program (TxDOT 2004; Orski 2004; *Urban Transportation Monitor* 2004).

RMAs can issue bonds backed by toll revenues, develop projects, operate toll roads, and contract with private-sector firms to build and operate toll roads. They also have access to regular state highway funds and federal aid to the extent allowed under federal program rules."[2]

**Public Private Partnerships**

Many states are considering expanding or creating toll programs by allowing public-private partnerships (PPP). PPP refer to contractual agreements formed between a public agency and a private sector entity that allow for greater private sector participation in the delivery of transportation projects. This expansion of the private sector roles allows the public agency to tap private sector technical management and financial resources in new ways to achieve certain public agency objectives such as greater cost and schedule certainty, innovative technology applications, specialized expertise or access to private capital. These partnerships may ease the initial financial burden of the capital cost for a facility on state government and/or tolling to finance transportation. However, it must be recognized that these costs are annualized in the repayment of the franchise. It should be noted that the earliest and most efficient example of PPPs are the independent toll authorities such as the Maine Turnpike Authority. These are seen as more efficient because the rate of needed repayment is only what is necessary without the need for profit. States with PPP legislation include Alabama, Arizona, California, Colorado, Delaware, Florida, Georgia, Louisiana, Maryland, Minnesota, Missouri, Nevada, North Carolina, Oregon, Puerto Rico, South Carolina, Texas, Virginia and Washington.

**Legislative Matters**

SAFETEA-LU

In August, 2005, the President signed into law the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). Relative to tolls and innovative financing opportunities, SAFETEA-LU make it easier and more attractive to use tolling, not only to manage congestion, but to finance infrastructure improvements as well. The following programs are available to States to toll on a pilot or demonstration basis:

- Interstate System Construction Toll Pilot Program. This program allows a State or compact of States to collect tolls on Interstate highways, bridges, or tunnels for the purpose of constructing

[2] Transportation Research Board, Special Report 285, The Fuel tax and Alternatives for Transportation Funding, Page 5-8

Interstate Highways. The program is limited to three projects in total (nationwide) and prohibits a state from entering into agreement with a private person which would prevent the State from improving adjacent public roads to accomodate diverted traffic.

- Interstate System Reconstruction and Rehabilitation Toll Pilot Program. This program, previously established in TEA-21, allows up to three interstate tolling projects for the purpose of reconstructing or rehabilitating Interstate highway corridors that could not be adequately maintained without the collection of tolls.
- Value Pricing Pilot Program. This program, also continued from TEA-21, provides up to $59 million in funding for up to 15 variable pricing pilot programs nationwide to manage congestion and benefit air quality, energy use, and efficiency.
- Express Lanes Demonstration Program. This program will allow a total of 15 demonstration projects through 2009 to permit tolling to manage high levels of congestion, reduce emissions in nonattainment or maintenance areas, or finance added Interstate Lanes for the purpose of reducing congestion. A State, public authority, or public and private entity designated by a State may also apply. Eligible toll facilities include existing toll facilities, existing HOV facilities, and newly created toll lanes. Tolls charged on HOV facilities under this program must use pricing that varies according to time of day or level of traffic. For non-HOV, variable pricing is optional. Automatic toll collection is required.

## Tolls - Public Opinion:

Americans have had it with traffic congestion. In fact, in some states it's the No. 1 complaint among citizens. And with estimates that travelers spend 90 minutes per day in their cars, it's a complaint that can't be ignored. The nation's transportation funding crisis means that taxes alone will not raise the estimated $94 billion needed annually for roadway work, so states are exploring innovative ways to ease congestion and generate money.

Toll roads are emerging as the solution of choice—but not the tolls of years past, with cars lined up to toss coins in a basket or hand over a ticket. With new technology that allows drivers to zip through toll plazas without so much as a tap on the brake pedal, toll roads now ease – instead of cause – congestion. And High Occupancy Toll (HOT) lanes, previously reserved just for vehicles with more than one occupant, are now available to single-passenger vehicles if they pay a premium toll.

A broad range of political and social views now support the use of tolls, at least as a supplement to taxes. Organizations range from the Progressive Policy Institute, which usually supports moderate to liberal democratic policies, to the conservative National Taxpayers Union, which is typically an opponent of big-government spending and increased taxes.

**But how do drivers feel about toll roads?** Aggregate results of many public opinion polls on these topics show that most Americans favor the trend toward tolls. That's important. According to a survey conducted by the U. S. Government Accountability Office and released in 2005, public and political support is the deciding factor mentioned by the majority of state transportation officials, when asked how they select projects.

**National Trends**

Below is an overview of recent public opinion studies on transportation issues in general and tolling in particular. Many of the findings indicate that those who have experienced an efficiently operated toll system are likely to be in favor of tolling as a solution to transportation problems:

**A 2005 ABC News/*Time* magazine/*Washington Post* nationwide survey on traffic issues conducted in January 2005:**
Among drivers polled in the Washington, D.C. area, attitudes about tolls differed sharply between city and suburban residents, perhaps reflecting the sense among District drivers that they would not be regular users of toll roads.
Three of four D.C. residents favored tolls over taxes, while 61 percent of Marylanders and 53 percent of Virginians shared that view.

**A poll conducted by the *Minneapolis Star Tribune* in January 2004 indicated that**69 percent of Minnesota adults are in favor of paying for new highway lanes with tolls collected from drivers who choose to use them. Only 23 percent would prefer to increase the gas tax to build new lanes and open them to everyone.

**The Reason Public Policy Institute recently compiled the results of surveys conducted in various states on the topic of congestion:**

- Recent surveys conducted in Washington, Minnesota and Florida shows that most motorists in congested areas are willing to pay to avoid congestion. The study finds no evidence of a correlation between personal income and willingness to pay.
- In a 2002 Public Policy Institute of California/University of California at Irvine survey, 65 percent of respondents said toll roads are a good thing, compared to only 16 percent who said they were not. Seventy-seven percent either strongly or somewhat agreed that tolls have helped relieve congestion.
- In a 2003 Design Research survey of South County residents in Orange County, Calif., 66 percent of respondents favored toll roads, and 69 percent supported construction of a new toll road project.

**Maine**

Support for improving highways and funding those improvements with tolls is at least as strong in Maine it is in the nation. 2005 Survey of 500 Maine residents, conducted by the Potholm Group indicated that by a margin of 45% to 13% Mainers are ready for bold new steps to change the way the state funds transportation.

For example, by a margin of 45% to 29%, respondents supported the idea of the Maine Turnpike Authority taking over and tolling parts of the aging interstate system and using the toll revenues to pay for repairs and improvements to those sections. 25% were undecided.

Tolls appear to be the payment method of choice for most Maine people. When asked to choose their preference among the four primary transportation revenues sources 49% chose tolls, 16% chose the gas tax, 10% chose bonds and only 3% chose general tax revenue.

Tolls rated extremely high in terms of fairness. Fully 82% of those surveyed said that tolls are fair, compared with 14% who found them unfair. By comparison 50% of those surveyed found the gas tax to be fair, while 43% found the gas tax to be unfair.

Moreover, the advent of E-ZPass electronic toll collection has improved the public's favorability towards tolls. 69% of those tolled agreed that electronic toll collection makes tolls a more attractive option to pay for highway and bridge improvements. Only 9% disagreed.

A 2005 statewide survey of 400 Maine residents conducted by Strategic Marketing of Portland indicated strong support for improving existing roads and bridges and building new ones with toll revenues. For example, when asked to choose between the gas tax or tolls for funding the repair of an important existing highway or bridge, 57% chose tolls, while only 16% chose the gas tax. 20.5 % said they didn't know and 6.5% said cancel the project.

Similarly, when asked about funding a major new highway, bridge or bypass, 57.8% favored tolls, 12.8% favored the gas tax, 19.8% didn't know and 9.8% said cancel the project.

**Survey conducted in 2002 by the San Diego Association of Governments and the California Department of Transportation of drivers using Interstate-15:**

- 91 percent of respondents supported having an alternate option for saving time on I-15.
- 66 percent of I-15 users who did not use the HOT lanes still supported the program.
- 71 percent of telephone respondents agreed that tolls were an effective way to keep the Express Lanes moving quickly.

Reasons cited for the success of the lanes included "improved travel times," "no lanes were 'taken' to improve mobility," and "lanes provide alternative choice for travelers."

**Application to Maine**

Many of the "things happening across the country" may not appear to be directly applicable in the State of Maine. For example, the use of HOT lanes would be difficult as they require new infrastructure including lane separation. The RMAs of Texas utilize funds generated not only by tolls but by increased fines. The point is, these are potential tools to be used now or in the future and as we improve or build new infrastructure we should consider their potential in solving the funding dilemma.

Tolling is also a tool and it has been successfully used in Maine. The Maine Turnpike was designed, constructed, widened and is well maintained all with tolls. Additionally, many of the larger bridges constructed in the early 1900s across the country and in Maine were toll bridges. Maine drivers have proven that they are willing to pay a user fee to drive on the Turnpike instead of the non-tolled alternate routes. This concept is easily adaptable elsewhere in Maine and can help reduce the State's transportation funding shortfall in a more predictable and reliable manner than motor fuel taxes. While HOT lanes and Truck only lanes may not be feasible in Maine today, the use of tolls on new infrastructure should be given serious consideration. Depending on the cost of a project, tolls can be used to offset some or all of a project's cost.

# Attachment C

## Detailed Outline of
## "Transportation 2025"

# Transportation 2025

*"Fueling this Economic Engine"*

## Introduction

Governor John E. Baldacci and the Maine Legislature's Transportation Committee have called upon the Maine Department of Transportation (MaineDOT) and the Maine Turnpike Authority (MTA) to lead a discussion in our state about the future of transportation in Maine. It is well known within the transportation community that reliance on fuel taxes as the primary source of funding, at both state and federal levels, is not sustainable into the future.

In order to maximize current resources, the Governor is encouraging a review of how we conduct the business of managing, maintaining, and constructing our transportation system. The Governor and the Maine Legislature will require a demonstration of commitment, from transportation agencies at all levels of government and the quasi-governmental sector, to manage our systems effectively and efficiently before new or expanded resources are even considered. In short, we must investigate strategies to maximize the investment of taxpayer resources in Maine's transportation system, and to do so in a fiscally prudent and sustainable manner.


An analysis of alternative revenue sources and innovative financing techniques that do not rely solely on motor-fuel taxes should also be conducted at the state and federal levels. Transportation investment is a long-term endeavor, and *Transportation 2025* is an initiative designed to develop strategies and concepts with which we can assess the needs and challenges facing transportation over the next 20 years.

## Statement of Objective

The objectives of this project are to educate policy makers and the public on transportation needs, to discuss the sustainability of current resources to meet those needs, and to define the challenges and opportunities facing the State of Maine and our communities over the next 20 years. There exists a looming transportation infrastructure deficit resulting from the combination of aging transportation assets, the unsustainability of the motor-fuel tax, (our primary revenue source at both the state and federal levels), and significant growing demands on the transportation system.

There will be two distinct elements to this effort:

## I. Planning, Management, and Maintenance of Transportation Systems and Assets

MaineDOT will partner with the MTA to develop a scope and strategy for addressing the infrastructure deficit. The scope will be shared with local and regional agencies, including Regional Planning Organizations (RPOs) and Metropolitan Planning Organizations (MPOs).

MaineDOT and the MTA will evaluate opportunities in the following areas:

- Collaboration on highway and bridge infrastructure projects
  - Short-term (two to five years)
  - Long-term (six to twenty years)
- Joint Strategic Plan on Alternative Modes
- Funding alternatives
- Operational efficiencies / joint facilities
- Local partnering opportunities

**II. Policy Development relating to transportation financing and needs**

This element of the process is designed to engage policymakers from the federal, state and local levels in a long-range policy analysis and development effort. Initial public discussion will center on the concepts we have developed or models obtained from around the country. The following is a process and schedule outline:

**December 2004 - Annual Transportation Conference**

The Annual Transportation Conference theme will highlight policy sessions intended to stimulate discussion about concepts that can be further refined over the next year. The conference will kick off a year-long process aimed at raising awareness of funding challenges, as well as possible short- and long-term solutions. The key objective of this program will be to highlight the impact of transportation on economic prosperity and the looming infrastructure deficit.

**Fall 2005 - Regional Transportation Forums (RTFs)**

A series of six regional forums will be conducted, each focusing on a different aspect of transportation, as well as on certain central themes. Local press, interested citizens, business leaders, and policy-makers will receive comprehensive briefings on the transportation system and funding issues as part of each conference. These forums will promote a higher level of public understanding regarding transportation needs, and funding challenges and limitations.

The Regional Transportation Forums will be conducted during the fall of 2005, and will be jointly hosted by MaineDOT, the Maine Turnpike Authority, and nine Regional Planning Organizations (RPOs). The RPOs include:

- **Androscoggin Valley Council of Governments** - Androscoggin, Oxford, and Franklin Counties
- **Eastern Maine Development Corporation** and **Hancock County Planning Commission** - Penobscot, Piscataquis, Hancock, and Washington Counties
- **Greater Portland Council of Governments** and **Southern Maine Regional Planning Commission** - Cumberland and York Counties
- **Kennebec Valley Council of Governments** - Kennebec and Somerset Counties

- **Mid-Coast Regional Planning Commission & Mid-Coast Council for Business Development & Planning** - Waldo, Knox, Lincoln, and Sagadahoc Counties
- **Northern Maine Development Corporation** - Aroostook County

## Regional Needs Assessments

*MaineDOT's Public Involvement Process for Long-Range Planning*

### Replacing RTACs with a more comprehensive approach

Over the past several months, MaineDOT's Bureau of Planning has been working to improve the public involvement process for long-range planning. After surveying Regional Transportation Advisory Committee (RTAC) members, meeting with several outside organizations, and brainstorming a variety of options, a new process was introduced this fall. The guiding principals that have shaped the new process include:

- The principles of the Sensible Transportation Policy Act;
- Governor Baldacci's goals of regionalism; and
- Coordination of economic development, land use, and transportation strategic-planning efforts.

These principles have led to a process that will be organized by Maine's Economic Development Districts and Regional Planning Organizations with the guidance of MaineDOT's Bureau of Planning.

Each Economic Development District has been asked to design a more inclusive public outreach strategy for its Region that will replace the Regional Transportation Advisory Committee. These outreach strategies include surveys, public forums, face-to-face interviews, and steering committees. Past RTAC members have been invited to participate in this public involvement process by sitting on steering committees and/or participating in public forums. Transportation 2025 will provide forums which the RPOs can use to meet these objectives.

Economic Development Districts are now conducting and analyzing community, census, and transportation research. Over the coming months they will be providing opportunities for input from the general public, representatives of municipalities, transportation and environmental professionals, and a diversity of other stakeholder groups. All of this will culminate in the production of Regional Needs Assessments (RNAs) that will then be integrated into a single statewide document. These assessments will examine demographic, economic, and land-use trends across identified transportation corridors and make recommendations for improvements.

The recommendations will be policy- and priority-based, and will not deal with specific transportation projects. Because of the effort to integrate transportation planning with land-use and community development, recommendations may also address those issues.

### Regional Needs Assessments – A Summary

## *A. Purpose, Use, and Schedule*

**Purpose:**

- Expand public involvement efforts into the long range planning process
- Identify transportation and corresponding land-use planning and economic development issues, and opportunities to maximize limited resources and make sensible investments at the local, regional, and state levels
- Identify and prioritize regional transportation corridors and transportation needs
- Consider modal opportunities
- Identify opportunities for leveraging additional financial resources
- Integrate information into Comprehensive Economic Development Strategies (CEDS)
- Identify intra-regional priorities

**How Used:**

- RNA recommendations will be integrated into the Long-Range Planning (LRP) process
- RNA's will support local and regional economic development and transportation initiatives

**Schedule:**

- RNAs ongoing; anticipated completion April/ May 2005, and once every five years thereafter

## *B. Defining the Infrastructure Deficit*

- Identify and quantify transportation needs between now and 2025
  - This will include data on conditions of transportation system, usage, etc. for all transportation modes. This must be done in a way that will roll into the LRP.
  - These analyses will need to take into account existing and future needs for transportation projects that add capacity for all transportation modes.

- Identify anticipated future funding based on traditional revenue sources:
  - Motor-Fuels Tax (Indexed to CPI)
  - Bonding
  - Federal reauthorization and earmarks
  - State appropriations
  - Tolls

- Based on anticipated needs/ projected revenues, quantify the overall infrastructure deficit, by mode, with specific information related to new-capacity projects

### *C. Identify mechanisms to meet funding gap; quantify implications of not meeting the gap*

- Research potential new funding sources to address the difference between identified/ projected needs and projected revenues to include tolling, public/ private partnership opportunities, revised cost-sharing policies, etc.
- Based on aforementioned transportation needs and anticipated funding levels, prepare an assessment of what ***not*** meeting the gap would mean for Maine's:
  - Economy
  - Environment
  - Quality of life
  - Legacy regarding the transportation funding gap – costs of doing things later versus now, such as right-of-way increases, etc.
  - System performance levels
  - Costs of deferred actions
  - Performance

### *D. Communicating the Infrastructure Deficit*

- Develop LRP draft sections based on A, B, and C above
- Regional Transportation Forums; these should precede the LRP and include meaningful public input
  - RPOs will arrange venue, advertise, and assure transportation stakeholders attendance
  - Facilitate, document, and analyze forums, including preparation of reports with executive summaries
  - Anticipated Agenda Items:
    - Education; needs v. resources; infrastructure deficit
    - Explanation of Regional Needs Assessments
    - Long-range plan purpose

### *E. Draft Long-Range Plan*

- The long-range plan document should include a concise synopsis of the following:
  - Transportation goals and strategic plan
  - Anticipated transportation needs
  - Projected transportation revenues
  - Strategy to meet gap between needs and revenues
  - Applicable sections of RNAs
  - State and federal requirements

- LRP Schedule
  - Kick off December 2004
  - Needs Assessments Due April/May 2005
  - Regional Transportation Policy Forums: Fall 2005
  - Report to the Governor and the Transportation Committee - January 2006