BENCHMARKING CONNECTICUT’S TRANSPORTATION INFRASTRUCTURE CAPITAL PROGRAM WITH OTHER STATES

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This study was initiated at the request of the Connecticut Department of Transportation on July 1, 2011. The project was conducted by an Academy Study Committee with the support of Study Manager Nicholas Lownes, PhD, PE and Study Advisor, Eric Jackson, PhD. The content of this report lies within the province of the Academy’s Transportation Systems Technical Board. The report has been reviewed by Academy Member Peter G. Cable, PhD. Martha Sherman, the Academy’s Managing Editor, edited the report. The report is hereby released with the approval of the Academy Council.

Richard H. Strauss
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Disclaimer

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This study was conducted to benchmark Connecticut’s performance in capital programming against other state DOTs, identify ways to improve the performance and efficiency of the capital programming process and create a tool, a “Transportation Investment Dashboard,” to communicate the performance of Connecticut’s capital program to the state’s transportation leadership.

Current data suggest that Connecticut’s capital program may be more reliant on federal sources than the selected benchmark and best practice states reviewed in this study. This finding may indicate that expanded state investment and/or alternative sources of revenue will be needed to keep pace with the state’s capital investment needs. ConnDOT is currently involved in many initiatives that are intended to improve the efficiency of the state’s capital programming process and linkage to long-term transportation goals. These initiatives should be continued and progress should be tracked in a transportation investment dashboard using relevant financial data and performance measures. These performance measures should also be used in formalizing the linkage between long-term planning and capital programming, and to ensure that resources are adequate to meet future travel demand.
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GLOSSARY OF TERMS

AASHTO  American Association of State Highway Transportation Officials
ARRA   American Recovery and Reinvestment Act
CASE   Connecticut Academy of Science and Engineering
ConnDOT  Connecticut Department of Transportation
FHWA   Federal Highway Administration
FFY    Federal Fiscal Year
FY     Fiscal Year (State)
GRTA   Georgia Regional Transportation Authority
LRTP   Long Range Transportation Plan
MassDOT  Massachusetts Department of Transportation
MDOT   Maryland Department of Transportation
MoDOT  Missouri Department of Transportation
MPO    Metropolitan Planning Organization
NCHRP  National Cooperative Highway Research Program
NEPA   National Environmental Policy Act
NJDOT  New Jersey Department of Transportation
NYSDOT New York State Department of Transportation
ROW    Rights of Way
RPA    Regional Planning Agency
STIP   State Transportation Improvement Program
TICP   Transportation Infrastructure Capital Plan
VTrans Vermont Transportation Agency
WSDOT Washington State Department of Transportation
EXECUTIVE SUMMARY

The Connecticut Department of Transportation (ConnDOT), like most state transportation agencies, is operating with an increasingly constrained budget. Decreasing state revenues from traditional funding sources (such as the gas tax), uncertainty in federal funding to states, and the increasing need to invest in aging infrastructure, has led ConnDOT and other state transportation agencies to reevaluate or adjust their planning and programming processes. As ConnDOT aims to meet the state’s long-term transportation goals in this constrained fiscal environment, they need to ensure that available funds are invested as effectively and efficiently as possible.

STUDY PURPOSE

This study was conducted to benchmark Connecticut’s performance in capital programming against other state DOTs, identify ways to improve the performance and efficiency of the capital programming process and create a tool—a “Transportation Investment Dashboard”—to communicate the performance of Connecticut’s capital program to the state’s transportation leadership.

BRIEF STATEMENT OF PRIMARY CONCLUSION

Current data suggests that Connecticut’s capital program may be more reliant on federal sources than the selected benchmark and best practice states reviewed in this study. This finding may indicate that expanded state investment and/or alternative sources of revenue will be needed to keep pace with the state’s capital investment needs. ConnDOT is currently involved in many initiatives that are intended to improve the efficiency of the state’s capital programming process and linkage to long-term transportation goals. These initiatives should be continued and progress should be tracked in a transportation investment dashboard using relevant financial data and performance measures. These performance measures should also be used to formalize the linkage between long-term planning and capital programming, and to ensure that resources are adequate to meet future travel demand.

SUMMARY OF BACKGROUND

The study’s literature scan revealed that several states maintain a capital plan, and unlike federally mandated documents, such as the State Transportation Improvement Plan (STIP), the information provided in these capital plans varied considerably. In particular, the sources of “state” funding varied in both the reliability and the diversity of sources. Therefore, the funding of planned capital expenditures provided from state sources should be considered an approximation. Interestingly, Connecticut has a percentage of revenues from federal sources (Figure 3(a)) consistently among the highest of the referenced benchmark states over the period 1992-2009.
STUDY DESCRIPTION

A three-phase approach was taken to the study, consisting of a literature scan; a series of focus group sessions with ConnDOT personnel; and a detailed survey, interviews and data collection and analysis of selected benchmark and best practice states.

SUMMARY OF FOCUS GROUPS

Focus groups sessions were held to investigate the current ConnDOT capital programming practices. These sessions identified several common issues in the capital program design and planning process that either can be, or are being changed, to improve efficiency. Changes included better communication throughout the process, further integration of project deliverability into the programming process, and the use of a bin of completed projects as a tool to manage uncertainty in the federal and state funding process. No formal linkage between the Long Range Transportation Plan (LRTP) and capital programming exists, though in practice, the five-year capital plan, along with the performance measures currently reported quarterly by ConnDOT, are being used to provide this linkage.

SUMMARY OF STATE SURVEY RESULTS

Six states—three benchmarking and three best practice states—were selected for study and analysis.

- Best practice states (Missouri, Vermont, and Washington) were identified through an examination of the literature on strengthening the planning/programming linkage, asset management, and performance measurement; and
- Benchmark states (Maryland, Massachusetts, and New Jersey) were identified through a small-scale quantitative comparison of the similarities between Connecticut and the selected states with regard to funding sources, transportation infrastructure, demographics and climate.

The survey findings revealed no evidence that a dependency on federal funds over state funds, with the associated lack of flexibility, limited a state transportation agency’s ability to link funding decisions to its long-term transportation goals. However, it is important to note that nearly all of the selected states reported interest in decreasing their reliance on federal funds due to federal funding uncertainty.

Another common concern identified in the survey process was the importance of better incorporating customer input into the planning process by measuring the level of customer satisfaction and reporting it regularly along with other performance measures.

All of the states surveyed are currently looking for ways to utilize their limited funding resources more efficiently. Most states are approaching this challenge by looking for new revenue sources, as well as implementing innovative contracting techniques to promote more efficient use of existing funds. Some of the proposed revenue sources include raising the gas tax,
implementing a mileage tax, and adding more toll roads. Additionally, some states include the number of projects completed through innovative contracting techniques in their performance metrics.

RECOMMENDATIONS

Based on the study findings, the CASE study committee offers the following recommendations.

- **Establish performance measures to track project deliverability and innovative contracting methods.** Project deliverability performance should be measured by monitoring the percentage of capital projects that are completed on time and on budget. Connecticut currently measures the percentage of construction contracts completed within budget and the percentage of construction contracts completed on time. While these are useful measures, they do not necessarily reflect the experience of transportation users. Therefore, an additional performance measure should be used that identifies whether a project is fully functional and open for public use on time. Enhanced tracking capabilities and linkage to performance metrics may require additional information technology (IT) resources, as was the case for most case study states. ConnDOT should consider contracting with a third party to develop a capital projects management system, customized to the department’s needs and organizational structure. Additional performance measures to consider for measuring project deliverability include:
  
  o Cause(s) of delay for project delivery
  o Variance between project budget and actual cost
  o Measures for projects undertaken using alternative innovative contracting methodologies, such as design-build, should include: number of projects, estimated time and cost savings, number of change orders, and number of contractor claims filed. Data measured for alternative contracting methodologies should be analyzed and compared with traditional design-bid-build methodology to assess the value achieved, if any.

- **Under-program (under-commit) the capital project plan while maintaining a bin of fully-designed, non-programmed projects.** For most of the states surveyed, the inclusion of a project in the state’s capital program is a guarantee that it will be delivered. All of the selected benchmark and best practice states interviewed in the study’s survey chose to under-program their capital budgets, though the methods used to under-program varied from state to state. Some of the states, such as Washington, make conservative project cost estimates. Other states, such as Maryland, simply do not program to the full amount of expected funding. However, these conservative programming methods often lead to unused funding becoming available at the end of a fiscal year. Therefore, to fully utilize available funding it is crucial to have a “bin” of projects that have been designed and have completed the permitting process that are not included in the capital plan. It should be noted that because ConnDOT has depleted their project bin through use of American Recovery and Reinvestment Act Act (ARRA) funding, in the short term it may be necessary to over-program to replenish the bin to achieve balance for under-programming over the long term.
• Develop and maintain a “Transportation Investment Dashboard” to monitor Connecticut’s transportation investment performance as compared to that of selected states. The dashboard is intended to communicate data and information clearly and visually to ConnDOT and state’s leadership for their use in assessing Connecticut’s capital planning/programming and project deliverability performance. Preferably the dashboard would be issued annually. Annual issuance will provide data and information at a frequency well suited for analysis of performance and program review. The dashboard should be web-based for easy access by decision-makers, policymakers and the general public. The performance metrics chosen for inclusion should be consistent with LRTP and TICP priorities.

It is suggested that ConnDOT consider using the dashboard to compare Connecticut with other selected states with respect to the level of state funding versus federal funding provided for capital projects. This will be a useful tool for determining the level of state funding appropriate to support Connecticut’s LRTP and investment in the state’s transportation infrastructure.

However, this effort would require ConnDOT staff resources to develop and maintain the dashboard system for ongoing reporting and analysis, as well as collaboration and communication with other states for the comparative analysis. Therefore, the implementation and frequency of issuance of the dashboard system should be considered in the context of the commitment of resources along with potential value of analysis to ConnDOT.

**Selection of Comparative States**

Options for the selection of states include:

• The benchmark states (Maryland, Massachusetts, New Jersey) and best practice states (Missouri, Vermont, and Washington) selected and surveyed for this study.

• New England Transportation Consortium states (Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont)

• Northeast Association of State Transportation Officials states (includes the New England states, as well as Delaware, Maryland, New Jersey, New York, and Pennsylvania) as well as the District of Columbia, and the Province of Ontario, Canada, or a subset of these states.

**Dashboard Data Considerations**

Most of the statistical and financial data used for the sample and proposed dashboards are submitted by each state annually to the Federal Highway Administration (FHWA). See Appendix B for data source information for the sample dashboards.

However, there is a two-year time lag from submittal of data by the states to public release of the data by FHWA on its website. This time lag in reporting unfortunately makes the suggested dashboard data outdated and less useful for analysis to assess capital planning/programming and project deliverability performance. This reporting time lag could be reduced by having ConnDOT take the lead in establishing a collaborative network of selected states willing for
mutual benefit to make state-level data available in a timelier manner. The dashboard concept could also be extended to provide a comparison of other aspects of state highway, public transportation, and other modes of transportation performance.

The purpose of the multi-state collaborative would be to:

- Determine data and information to include in the individual state and summary dashboards
- Report the commonly defined data
- Meet periodically to review the findings from the dashboard update, identify best practices to address capital planning/programming and project deliverability challenges.

**Sample Dashboards**

Two types of dashboards are conceptualized: an individual state dashboard and a summary dashboard that provides an overview of the comparative states.

Individual state dashboards could include key statistics on demographics, infrastructure, and finance in conjunction with a select group of performance measures that provide a linkage between LRTPs and TICPs.

An example of a state dashboard for Connecticut is shown in Figure ES-1. The proposed state dashboard also would include a table similar to Table 3 of this report (see page 20) that provides data on key demographic and infrastructure factors for each state.
Benchmarking Connecticut’s Transportation Infrastructure Capital Program with Other States Executive Summary

### Capital Program Investment Dashboard: Connecticut

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Latest Reporting Period</th>
<th>Performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatalities per 100 M VMT</td>
<td>0.71 (CY 2009)</td>
<td>Improving</td>
</tr>
<tr>
<td>Fatalities per 100,000 population</td>
<td>6.34 (CY 2009)</td>
<td>Improving</td>
</tr>
<tr>
<td>Pavements with Good Ride Quality (% with IRI &lt; 95)</td>
<td>20 (CY 2010)</td>
<td>No Change</td>
</tr>
<tr>
<td>State Roadway Bridges in Good Condition (%)</td>
<td>32 (CY 2010)</td>
<td>Improving</td>
</tr>
<tr>
<td>Road Network with Traffic Volumes &gt; Capacity (%)</td>
<td>8.67 (CY 2010)</td>
<td>Improving</td>
</tr>
<tr>
<td>Rail Passenger Trips</td>
<td>9,847,219 (CY 2011-Q3)</td>
<td>Declining</td>
</tr>
<tr>
<td>Bus Passenger Trips</td>
<td>6,856,175 (CY 2011-Q3)</td>
<td>Improving</td>
</tr>
</tbody>
</table>

**Figure ES-1: Capital Program Investment Dashboard (State Example: Connecticut)**

The summary dashboard compares each state’s transportation revenues, disbursements, and ratios of federal funds to capital expenditures over time. A sample summary dashboard using the benchmark and best practice states included in this study is shown in Figure ES-2. The State Transportation Revenues Sources and State DOT Disbursement tables at the top of the dashboard are the same as Figures 2(a) and 2(b) from the state survey section of this report. Also, the Ratio of Federal Funding to Capital Expenditures graph shown at the bottom of the dashboard is a composite of Figures 4(a) and 4(b) from the state survey section of this report. Analysis of the information provided in the summary dashboard could lead to follow-up analysis to gain a more detailed understanding of commonalities or differences between the states.
Summary Dashboard (Highways and Bridges) – Benchmark and Best Practice States

- Administer periodically a customer survey to provide insight into user preferences and to gauge customer satisfaction. ConnDOT should consider conducting an annual customer survey to best assess timely trends in customer satisfaction. Survey results would be used to report customer satisfaction with ConnDOT’s performance and to serve as a guide for setting priorities. The survey should be used by ConnDOT in conjunction with other performance measures to determine actions for improving work systems, project deliverability and overall public satisfaction with the state’s transportation system over time.

As noted in the study findings, most of the benchmark and best practice states included in this study have significant experience in using customer surveys to provide an independent assessment of customer satisfaction that can serve as models for ConnDOT. Consideration should be given to contracting with a company/organization experienced in developing, conducting, analyzing, and reporting through the use of surveys. Also, ConnDOT should engage in a public awareness effort to make available and inform the public of its LRTP goals and its capital planning/programming process using its web presence and opportunities available through public project meetings and other events.
CONCLUDING REMARKS

The study recommendations provide a framework for continually reviewing and assessing ConnDOT’s capital planning/programming process and project deliverability performance, as well as linkage with the goals of the state’s LRTP.

Providing transparent data and information to the state’s leadership and the general public through the use of visible dashboards could help increase accountability and serve as a basis for establishing a better understanding of ConnDOT’s capital program, the condition of the state’s transportation infrastructure, and the need for resources to support the goals of the LRTP. Involving the public in this process requires increasing public awareness and measuring customer satisfaction.

The development of a multi-state collaborative of benchmark and best practice states should be considered by ConnDOT to provide the department with opportunities to share its experience with other states and to learn about innovative solutions to improve the efficiency and effectiveness of its capital program investments.