PRI RESULTS-BASED ACCOUNTABILITY PROJECT 2010

DOT Project Delivery:
Staff Findings and Recommendations Highlights

Study Purpose and Focus

- This study fulfills the second phase of the program review committee's effort to test the use of a Results-Based Accountability (RBA) approach for its legislative oversight work.

- The study focused on the project delivery process used by the Department of Transportation (DOT), specifically examining the process from project initiation through completion to answer the RBA program performance questions: *How Much Did We Do? How Well Did We Do It? Is Anyone Better Off?*

Progress on Population-Level Results

- The study identified the following "quality of life results statement," within which an RBA framework was developed for DOT project delivery to guide data collection and analysis: *Connecticut's transportation system is maintained in a state of good repair and allows for safe, efficient movement of people and goods, livable communities, and sustainable growth."*

- The state's progress in achieving this desired population-level result was examined based on five key indicators: safety, efficiency, state of good repair, environmental quality, and economic vitality.

- Much of what drives the indicators is beyond the control of DOT or any single state agency; there also are limitations to the availability and/or quality of current indicator data. Overall, progress toward achieving the population-level results statement is mixed.

- DOT has instituted a number of management reforms and undertaken several planning efforts intended to make better progress on state transportation system goals. However, overall accountability for results is diluted, and there is no comprehensive long-term strategic plan for, or systematic way to track progress on, achieving these goals.

Staff Recommendations

1. **Amend existing statutory language to replace the department's current master plan requirement with an annual transportation system progress reporting process based on Results-Based Accountability principles. Each year, by January 15th, the Department of Transportation shall submit to the legislature, and publish on its website, an RBA framework that includes the quality of life results statement for the state transportation system and an assessment of progress toward those results based on key indicators.**

2. **The framework, results statement, indicators, and annual progress reports should be prepared jointly with the Transportation Strategy Board, with input from major partners and stakeholder groups.**

3. **As part of an RBA data development agenda, DOT, in consultation with its partners, should review the adequacy of current indicators and related data resources for assessing progress toward desired results for the state transportation system. Together, they should determine whether there may be more appropriate alternatives for primary indicators and what additional secondary indicators are needed to provide greater public accountability. Preference should be given to indicators that are compatible with the national performance measures.**

Program Performance Assessment: DOT Project Delivery Report Card

- Transportation project delivery is a process and not a discrete agency program with a single, cohesive management structure. Performance can be gauged according to several core measures: projects are delivered on schedule, within budget, in compliance with relevant standards and requirements; and delivered projects achieve their intended benefits.

- The transportation department's overall performance on these core measures is unclear and difficult to assess at present. Quantitative data necessary to address RBA questions regarding outputs, efficiency, and outcomes of the project delivery process are limited, rarely centrally collected, and sometimes not available.

- DOT has implemented and is considering many positive changes and promising initiatives to enhance project delivery; it is too early to determine their full impact.

- The department needs to ensure progress toward data-driven management of the state transportation system and performance measurement becomes embedded within the department.

- A stronger connection between performance, funding decisions, and strategic goals also is needed. The agency's current RBA and performance measurement efforts could be combined to reduce duplication and promote a better partnership with the legislature.

- Several overarching issues for DOT project delivery success were identified, including:

    - Better control over project initiation and design development is necessary to ensure the department's program of capital improvements can be effectively managed and measured.

    - Current agency automated systems do not support strong project management and oversight throughout the entire project delivery process. Information systems for

managing design development are especially weak. Effective coordination between the preconstruction and construction phases is impeded by a lack of up-to-date project management tools and technology.

- A better use of "lessons learned" from completed projects could help to ensure best project delivery practices with proven results are transferred across the agency and broadly applied.

- Quality assurance efforts need to be better integrated with the agency's performance measurement system to promote continuous quality improvement.

- Creative contracting methods shown to save time and money for construction project delivery cannot be used by the department at present and need to be explored.

- Information exchanged between the Departments of Transportation and Environmental Protection is not fully coordinated or in total compliance with the requirements of a Memorandum of Understanding between the two departments regarding staffing.

Staff Recommendations

4. **DOT create a performance measurement results steering committee comprised of top managers representing each bureau. It should meet quarterly with performance measures staff and the commissioner to review and discuss current results data, identify successes and problem areas, and direct actions to improve outcomes.**

5. **The department incorporate RBA as a primary tool for promoting performance measurement and management for results throughout the agency.**

6. **The department continue developing the centralized project initiation process and have it in place through a formal department policy statement by July 1, 2011. This process should be used to maintain and regularly update the agency's five-year capital planning document.**

7. **Implementing the new integrated project management system as scheduled be a top priority of agency leadership. Also, the department should ensure the new system will be able to track all major steps of the preconstruction process, including: consultant hiring; agreement execution; rights-of-way and utility relocation milestones; and timeframes for environmental reviews and permitting.**

8. **The quality assurance office organize and sponsor a lessons learned event to evaluate project delivery success for a sample of completed projects at least annually.**

9. **The quality assurance office work with the performance measures unit to develop quantitative measures of compliance and quality for projects the department delivers. As a first step, quality assurance and performance measurement staff should compile, review, and summarize the results of evaluations of contractor and consultant performance to share with top agency managers.**

10. **Legislation be enacted to permit the department to use design-build and other alternative contracting approaches on pilot basis. Prior to project initiation, the department shall submit a project, and the criteria used to select it as a pilot for design-build or other alternative contracting method, to the legislature's Transportation Committee for review and approval. DOT also shall evaluate the delivery success of the pilot project in terms of timeliness, cost, and quality, and report the results to the Transportation Committee within three months of project completion.**

11. **DOT and DEP re-evaluate the requirements of the current memorandum of understanding regarding support for permit staff to ensure they include realistic reporting requirements of how the funding is used, how it makes the transportation project permit processing function more efficient, and what benefits DOT (and the state) receives from its funding of DEP positions. Any revisions to the MOU should occur by October 1, 2011.**

12. **The commissioners of DOT and DEP establish an interagency workgroup to meet and discuss ways to fully achieve a balance between expediting transportation project delivery and ensuring proper protection of the environment. Issues to be discussed within the workgroup should include: maximizing environmental permitting coordination and streamlining; involving DEP in the transportation project design phase as early as reasonable; examining alternative mitigation strategies; assessing the implementation of creative contracting methods (including design-build); and identifying ways to fully attain and maintain efficient and effective communication. The workgroup should be established by July 1, 2011, and relevant information, including agendas and meeting minutes, should be posted on each agency's website.**

13. **The Office of Environmental Planning begin to fully track its performance for processing environmental review documents and permit applications for transportation projects. The office should determine its main performance measures and frequently gauge its performance against those measures. The results should become part of the department's overall performance measurement system. The department also should determine whether its new automated project management system could contain information to better track and measure environment-related activities within the transportation project delivery process.**

How Much Did We Do?

- The size and scope of the DOT project delivery workload is difficult to determine because project data are maintained in a number of different information systems. The best available data about active DOT projects are for those authorized to receive federal funding. Information about completed projects is only centralized at this time for capital improvements carried out by the agency's Bureau of Engineering and Construction.

- The number and size of active projects and projects delivered by DOT can vary greatly from year to year. Based on best available data:

    - the department's annual workload of all active federally authorized highway and public transportation improvements averaged 285 projects, with a total annual value (not including any federal stimulus funding) about $560 million on average (FFYs 06-09); and

    - on average, the agency's Bureau of Engineering and Construction delivered around 63 construction projects per year, with total final construction costs per year ranging from about $100 million to more than $740 million (SFYs 05-09).

- The bulk of projects the department delivers involve federal funding and are subject to federal planning, design, construction, and procurement requirements.

- Staff resources for project delivery include department employees and outside professional services; the capacity and cost of DOT staff responsible for project delivery is not known.

Staff Recommendations

14. **The department, as part of its effort to establish a centralized new project initiation process, develop and maintain a database that can identify and monitor the agency's complete project delivery workload.**

15. **The transportation department seek the assistance of the Connecticut Academy of Science and Engineering in preparing a talent assessment of its existing staff capacity and projecting its future staffing needs for capital improvement project delivery implementation. The results of this assessment should be completed by July 1, 2012, and shared with the legislature's Appropriations and Transportation Committees.**

16. **The department should establish a mechanism to track the direct and indirect costs of the design, construction inspection and administration, and project management services its employees provide on a per project basis. Measures of project delivery workload, such as project dollar value per employee, also should be developed and used to monitor trends in internal staff capacity.**

17. **The Department of Transportation conduct an analysis of transportation project design costs that compares the costs associated with work done by department employees to costs of using private design firms. The analysis should be conducted and completed by July 1, 2012, with a report of the results forwarded to the legislature's Transportation and Appropriations committees on or before that date**.

How Well Did We Do It?

- Overall, there has been limited relationship between original budgets and schedules set during project design and the actual costs and times to complete projects. The department, partly in response to federal concerns, is working to improve the accuracy of its project cost and time estimates and better control the design phase of project delivery.

- The department lacks an automated transportation project management system that can track and monitor projects throughout the entire project delivery process, from initiation through completion. As such, aggregated data on project delivery performance is lacking.

- Additional performance measures need to be developed for major milestones within the project delivery process; current measures on project timeliness and cost effectiveness need strengthening.

On-Time Performance

- The time required to complete the transportation project delivery process – from initiation of project design through construction – increased between 2001 and 2010.

- The time to complete the full project delivery process averaged 1,918 days (5.3 years) for projects completed between 2001-10. The project design component accounted for the largest portion of time within the overall project delivery process, averaging 1,195 days, or 61% of the full project delivery process.

- Project construction completion times determined as part of the project design process are consistently underestimated: 37% of projects were completed on-schedule. The average for 15 other states was 53% between 2001-05.

- Projects exceeded their original construction dates by an average of 223 days (median was 144 days).

- The percent of projects completed beyond their original schedules was higher for state projects than municipal projects, 68% and 44% respectively.

- The highest percentage of projects not completed within their original schedules was for those with the highest original costs (>$20 million). Conversely, the lowest percentage of projects not completed on time was those with in the lowest original cost range (<$5 million).

- Projects exceeding their original completion dates with original costs over $20 million were completed an average of 852 days beyond their deadlines. This average is almost five times that of projects not completed on schedule in the "less than $5 million" range, which averaged 174 days.

Staff Recommendations

18. **The Department of Transportation continue to examine ways to streamline the time it takes to complete major milestones within the project delivery process. Once the agency's new integrated project management system is fully operational, targets for completing each major step of the design process should be set and monitored by the engineering bureau, with the assistance of the performance measures unit. Attention should be paid to: 1) the degree to which design consultants and staff engineers meet established deadlines for designing projects; 2) the process used by project designers to estimate the amount of time necessary for project completion to ensure such estimates are realistic; and 3) the advertising and contract bidding processes.**

19. **The department continue to fully focus on the link between project design and time extensions to project construction due to design errors or omissions, with the specific goal of increasing the department's performance for completing projects in accordance with their original schedules.**

20. **DOT set a yearly performance goal for delivering transportation projects within schedule for construction purposes, rather than continuing to use its recently-established standard of "maximizing percent of construction contracts completed on time." The department's performance toward achieving the new goal should be part of its current initiative to measure project completion performance. The goal should be realistic and re-evaluated at least annually.**

21. **The department add the following components to its current measure for on-time project delivery performance: 1) the aggregate times projects are taking to complete beyond their original deadlines; and 2) the aggregate amount of time each reason for scheduling extensions (as identified in the department's current measure) adds to the overall time for completing projects.**

22. **DOT begin benchmarking its performance for delivering transportation projects on schedule with the performance of other states for comparative purposes. DOT should identify best practices used by states with better project completion performance, and determine whether to implement such practices within its project delivery process.**

23. **DOT include on its website a "watch list" of all projects approaching time overruns for the design and construction components of the project delivery process.**

On-Budget Performance

- The percent of projects incurring cost overruns of more than 10% decreased 49% for projects completed between 2001-10, which the sharpest decline occurring in 2010.

- Just under three-fourths of projects incurred some degree of cost overrun when compared to original construction budgets; the average cost overrun for projects over budget was 23% and the median was 12%.

- Of the projects completed *below* their original budgets, the average amount under budget was 8% and the median amount was 5%.

- Construction for 42% of projects was completed over original budgets by more than 10%. The average cost overrun for the projects over 110% of their original budgets was 37% and the median was 21%.

- The percent of projects incurring cost overruns of >10% was essentially the same whether the state or a municipality delivered the project: 42% and 41% respectively.

Staff Recommendations

24. **The Department of Transportation begin analyzing its project delivery process with the goal of developing a system through which the department can fully determine the project costs associated with each major milestone of the project delivery process. The system should allow DOT to identify the level to which projects are completed within established budgets for each milestone. The results should be reported as part of the department's performance measure for delivering projects on-budget.**

25. **The department establish a goal of having the lowest responsible bid amount be no greater than the design engineer's estimate. Progress toward achieving such goal should be measured at least annually.**

26. **DOT set a yearly goal of delivering transportation projects within budget for construction purposes, rather than continue using its recently-established standard of "maximizing percent of construction contracts completed on-budget." The department's performance toward achieving the goal should be part of its current initiative to measure on-budget performance. The goal should be realistic and re-evaluated at least yearly.**

27. **The department add the following components to its current measure for on-budget performance: 1) the total dollar amount of construction cost overruns; and 2) the amount each reason for cost overruns (as identified in the department's current measure) adds to overall project costs.**

28. **DOT sharpen its focus for analyzing project design cost estimates with bid amounts and final project costs to link the cost estimating process with overall project construction costs. The results should be included in the department's performance measures as an indicator of estimating accuracy for transportation projects, and for use to continually improve the project estimating function.**

29. **The department continue researching whether it should set different contingency standards for projects based on project cost and/or type of project. Any changes to the current contingency level should continue to move the project delivery process toward delivering projects within original budgets.**

30. **The department include on its website a "watch list" of all projects approaching cost overruns (including applicable contingencies).**

31. **The department begin analyzing its performance on delivering transportation projects within budget with the performance of other states for comparative purposes. The results also should be used in helping develop appropriate benchmarks and standards for delivering cost effective projects.**

Is Anyone Better Off?

- Overall timeliness of project delivery is just beginning to be tracked and reported by DOT.

- Cost-effectiveness cannot be determined; complete costs of projects from design through final delivery and data on project end results are not easily available.

- Customer satisfaction with DOT project delivery performance is not measured in any comprehensive way.

Staff Recommendations

32. The DOT performance measures unit identify existing sources of customer feedback information throughout the agency and become a repository for all data related to customer satisfaction. Unit staff also should help managers in each bureau develop low-cost ways, such as focus groups and on-line surveys, to regularly obtain and use input from stakeholders to assess project delivery and other critical performance areas.

33. The department establish and report on measures of customer satisfaction as part of the ongoing development of its performance measurement system.