

EFFECTIVE PROGRAM DELIVERY IN A — **CONSTRAINED** — FISCAL ENVIRONMENT

AMERICAN ASSOCIATION OF
STATE HIGHWAY AND
TRANSPORTATION OFFICIALS

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Table of Contents

1.0 Introduction: Purpose of the Study	1
1.1 Background—Problem Statement.....	1
1.2 Phase 1 Objectives and Report Structure	2
1.3 Phase 1 Methodology	3
2.0 Forces of Change in Program Delivery Management	5
2.1 Introduction/Overview.....	5
2.2 Symptoms of Need for Change and for New Tools and Techniques.....	5
2.3 Forces of Change.....	9
2.4 Summary—Combined Impacts of Forces of Change	21
3.0 State of the Practice: Tools, Techniques, and Management Processes for Effective Program Delivery.....	22
3.1 Introduction	22
3.2 Identifying Priorities.....	22
3.3 Obtaining Resources.....	25
3.4 Delivering the Program.....	27
3.5 Managing Finances.....	29
3.6 Summary.....	32
4.0 Conclusions and Recommendations for Possible Further Study	39
4.1 Introduction	39
4.2 Preliminary Recommended Topic Areas for Further Study	39

1.0 Introduction: Purpose of the Study

1.1 Background—Problem Statement

During the Interstate-building era, state department of transportation (DOT) program delivery functions were fairly straightforward. For the most part, state agencies worked with the Federal Highway Administration (FHWA) to plan facilities, determine funding needs, and set construction schedules. Projects were developed and constructed on a pay-as-you-go basis; FHWA reimbursed states for 80 to 95 percent of project costs; budgeting focused on ensuring federal funding did not lapse; and large cash balances, cost overruns, or project delays while not uncommon were not considered a major problem.

State DOT program delivery has become much more complex in recent years. Today, DOT managers face new challenges and requirements with respect to 1) delivering projects on time and on budget, 2) distributing funding efficiently and equitably, 3) developing projects in a manner that protects the physical and social environment, 4) managing (and leveraging) resources as efficiently and effectively as possible, and 5) including other agencies, interest groups, and the public in project prioritization and funding decisions. With these new challenges, it is no great surprise that states are having difficulty programming, budgeting, and administering realistic, politically viable, and financially constrained transportation programs.

Effective program delivery is achieved through the establishment of sound policies and procedures that address the management of projects throughout the project and program delivery process. It is a state of practice that transcends individual project phases and provides a continuum of sound management throughout the life of a project—and a transportation program. There is a wide variation, however, in the management approaches, systems, and tools being deployed by state departments of transportation. While some states are known for use of highly integrated approaches, many still rely on informal and fairly unstructured methods.

There are a number of driving forces to the increasing importance of more systematic approaches to program delivery. These include forces, or influences, within each of four broad program function areas, as follows:

- **Identifying Priorities**—While states have always faced constrained funding, the constraints are even more profound today. States also are being held to a higher standard of accuracy in what they promise, requiring that they more carefully prioritize program needs and actions.
- **Obtaining Resources**—New revenue sources, finance mechanisms, and grant management techniques require more sophisticated market analysis and greater knowledge of their flexibilities, restrictions, and long-term program implications. With the anticipated advent of new techniques, knowledge of these approaches will become even more critical.
- **Delivering the Program** (note: this functional area has been renamed and expanded from “Redefining Roles” in original NCHRP project statement)—To deliver larger programs

with smaller staffs, DOTs are turning more to outsourcing and other techniques that require development of human resource management systems beyond the traditional state agency program delivery approaches of the past. Also, many state DOTs are decentralizing or delegating project selection, project development, and project financial management responsibilities, expanding the number of staff who require expertise in project prioritization techniques, innovative finance options, and financial management.

- **Managing Finances**—With greater use of debt financing and greater project complexity, states require more sophisticated administrative programs and new types of staff expertise to oversee both the cost management and funding aspects of program delivery.

Together, the forces acting in each of these four functional areas contribute to the challenge of planning, programming, budgeting, and administering viable fiscally constrained programs.

To date, there has been limited focused documentation of what states are doing to address these forces, including development of new tools, processes, and management approaches. Nor has there been comprehensive documentation of the gaps in current practice and associated tools. Therefore, there is a need for a broad “50,000-foot view” of how the various pieces fit together, what is missing, and how best to address the identified gaps.

1.2 Objectives and Report Structure

The objective of this study was to develop a comprehensive understanding of the driving forces that have contributed to difficulty in program delivery in today’s constrained fiscal environment. In support of the overall study objective, the specific objectives were: 1) to define and describe the forces of change and associated impacts on program management and delivery; 2) to document the state of the practice among state DOTs, including gaps that may exist in tools, techniques, and management processes to support program delivery; and 3) to make recommendations regarding topic areas for further research.

In fulfillment of the study objectives, the remainder of this interim report is dedicated to:

- More fully discussing the forces of change across the four broad functional areas of 1) identifying priorities, 2) obtaining resources, 3) delivering the program, and 4) managing finances (**Chapter 2**);
- Documenting current tools, techniques, and management processes deployed by state DOTs to respond to these forces of change and identifying gaps in the state of the practice (**Chapter 3**); and
- Highlighting promising new and emerging practices and offering recommendations for a Phase 2 study of noteworthy practices and lessons learned (**Chapter 4**).

1.3 Phase 1 Methodology

To meet the objectives of this phase of the study, the research team followed a multi-pronged approach that included an in-depth review of the relevant literature, outreach to state DOT officials and other industry leaders, and application of the research team's own experience and expertise to develop a comprehensive accounting of the forces influencing the four identified areas of program delivery management, the current state of the practice, and gaps in the tools, techniques, and strategies, with an aim toward identifying the most promising areas for further study.

1.3.1 Literature Review

To supplement direct research, the research team conducted an in-depth review of the relevant literature. Results of the literature review are incorporated throughout this interim report.

Given the cross-cutting nature of issues associated with program delivery in a constrained fiscal environment, the research team cast a wide net for potentially relevant literature, including reports and studies that directly or indirectly address the following topics—either individually or in combination:

- Strategic Planning
- Long-Range Planning
- Programming
- Asset Management
- Performance Measurement
- Economic Benefit/Cost Analysis
- Transportation Funding and Finance
- Financial Management Practices
- Public–Private Partnerships
- Outsourcing and Alternative Procurement
- Project Management
- Organizational Change
- Human Resource Management
- Public Involvement

The research team concentrated on literature that identifies broad trends rather than on individual mechanisms or experiences of single states.

The research team focused the literature review on the following sources and body of material:

- **Transportation Research Board (TRB) and National Cooperative Highway Research Program (NCHRP)**—including reports, circulars, e-circulars, syntheses, conference proceedings and presentations, and web documents;
- **Federal Highway Administration (FHWA)**—guidance, primers, subject matter reports, and web pages;
- **American Association of State Highway and Transportation Officials (AASHTO)**—reports, conference presentations, and web pages;
- **Government Accountability Office (GAO)**—reports to Congress; and
- **Universities and Other Research Organizations**—relevant reports and studies.

The research team also reviewed bibliographies of other reports to identify additional relevant material and familiarized itself with the potentially relevant resources available beyond the

transportation field, such as those of the Government Finance Officers' Association (GFOA), independent rating agencies, and associations of state government (e.g., National Conference of State Legislatures, National Governors' Association, National Association of State Budget Officers). While materials from these organizations are not included directly in the literature review, it is anticipated that they will be important resources to the research team in Phase 2 of the study, depending on the topic areas chosen for further study.

1.3.2 Outreach

Concurrently with the review of relevant literature, the research team conducted interviews and informal discussions with a wide range of industry participants. This outreach effort included discussions with the following:

- **Current and Former State DOT Officials and Staff**—including from Colorado, Florida, Illinois, Indiana, Kansas, Kentucky, Maryland, Mississippi, Missouri, New Hampshire, North Carolina, and Virginia;
- **FHWA and FTA Staff**;
- **Leaders and Staff of Relevant Industry Organizations**—including the American Association of State Highway and Transportation Officials (AASHTO), the American Road and Transportation Builders' Association (ARTBA), and the Association of Metropolitan Planning Organizations (AMPO);
- **Individual Members of the Project Panel**; and
- **Other Consultants**—including from other firms as well as additional staff from within the research team's organizations with relevant experience and expertise.

The research team also attended relevant national conferences and collected materials from these conferences that were of relevance to this study. Examples included: the Annual Transportation Research Board meeting; the Joint Summer Meeting of the TRB Planning, Data, Finance, Administration, Freight, and Management Committees; the AASHTO Annual Meeting, several individual committee meetings, and the Project Finance Institute; the Second National Conference on Performance Measures in Transportation; and the Southern Transportation Finance Conference. Results of the outreach efforts are incorporated throughout this report and help to form the foundation of recommendations for Phase 2 research.

1.3.3 Synthesis

Following completion of the literature review and outreach efforts, the research team worked to synthesize the research results, applying team members' individual knowledge and experience and with a special focus on providing real-life examples of the research findings, considering the implications of passage of the newest federal highway authorization—the Safe, Accountable, Flexible, Efficient, Transportation Efficiency Act—a Legacy for Users (SAFETEA-LU), and developing recommendations for focusing on the highest and best value topic areas for Phase 2 of the study.

2.0 Forces of Change in Program Delivery Management

2.1 Introduction/Overview

The forces of change in transportation program delivery management are complex, characterized by significant interrelationships among the forces as well as the functional areas upon which these forces act, and have both positive and negative impacts. This chapter first highlights the symptoms of the need for change and for new tools and techniques to address past and ongoing changes. It then reviews specific forces or influences identified as being key drivers to transportation program management, across the four functional areas:

- **Identifying Priorities**—Which, for the purposes of this study, includes the program management disciplines of strategic planning, long-range planning, programming, asset management, performance measurement, and economic benefit/cost analysis;
- **Obtaining Resources**—Including program management functions related to securing federal funding, raising state revenue, attracting private and local financial participation in states' transportation programs, and leveraging these sources through the application of capital market financing;
- **Delivering the Program (Redefining Roles)**—While the title of this category is quite broad, this study focuses on program management elements related to the choice between and impact of in-house delivery and outsourcing and the distribution of management responsibilities among divisions of the DOT, outside advisors, and contractors; and
- **Managing Finances**—Including the administrative functions associated with managing an increasingly complex pool of financial resources, including debt management, cash management, and cost estimation and control mechanisms.

2.2 Symptoms of Need for Change and for New Tools and Techniques

Over the years, the transportation industry has put significant energy and resources into improving the way transportation programs are planned, managed, and delivered. These efforts have yielded great improvements in critical areas such as long-range planning, project development, asset management, and finance. Despite the many advancements, several symptoms—highlighted below—point to the need for additional or improved program management and delivery tools and techniques.

2.2.1 Strategic Priorities Detached from Program Delivery

While many states have begun to spend greater energy on creating strategic plans and articulating the organization's goals and objectives, these plans are often created with limited bearing on the actual day-to-day business of the organizations for which they are theoretically setting strategic direction.

2.2.2 Multiple but Not Integrated Strategic Initiatives

State DOTs have made significant advances in formulating and applying strategic-oriented initiatives. These generally occur in the areas of performance measurement, strategic planning, long-range

planning, and asset management. These efforts, however, tend to be largely uncoordinated, overlapping, and even at times contradictory to one another. They generally operate in their own worlds with little systematic effort to align them with one another.

2.2.3 Planning and Program Delivery Disconnects

Transportation system planning refers to a broad range of activities that include statewide and metropolitan long-range planning, medium-range planning, special program planning, and corridor planning. In theory, the common characteristic of these various activities is that they should provide a basis for policy, program, and project decision-making. In practice, however, agencies often treat system planning and program delivery in isolation, with little coordination between the two. Examples of areas where this disconnect can lead to inefficiencies and/or problems include:

- **Program Development**—Agency programs may be established or revamped based on state or federal mandates, political considerations, or other influences that are inconsistent or incompatible with plan goals and objectives;
- **Resource Allocation**—Legislative requirements, political pressure, and/or historical precedent can lead to or perpetuate allocation practices (e.g., geographic, modal, etc.) that do not reflect plan priorities; and
- **Project Prioritization**—Planning personnel often are not involved in programming functions and have limited interaction with agency staff that has responsibility for project selection. Also, the processes and criteria agencies use to identify and select projects frequently are not revised to reflect new plan priorities.

2.2.4 Poor Pipeline Controls between Project Development and Programming

Many DOTs find themselves with one of two problems: too many projects sitting on the shelf awaiting funding—and in some cases becoming outdated or obsolete in the meantime—or too few projects ready to go. The latter problem can manifest itself when a particular project must be delayed for some reason and a state finds itself without alternative projects that are ready to go in its place. It is a delicate balance that must be maintained, and states do not always have adequate (or sometimes any) mechanisms in place to manage the balance.

2.2.5 Over-Programming

Programming is a critical program delivery activity. For many agencies, it is the first time that they commit to deliver individual programs and projects on a specified schedule and for a defined cost. At the time projects are programmed, however, limited information may be available about factors that influence the risk associated with project cost, scope, and schedule estimates. Programming processes thus require a combination of science and art to balance between building in sufficient cost contingencies (i.e., over-estimating program and project costs) and placing enough projects into the delivery pipeline (i.e., over-programming) to ensure scarce resources will not lay idle due to project development schedule slippages or unforeseen circumstances.

Many transportation agencies recently have run into significant problems with the accuracy and legitimacy of their programming processes. Over-programming causes, such as funding cutbacks, overly optimistic revenue and cost forecasts, greater project development complexity, legislative mandates, and/or unrealistic schedules have led to situations where many agencies are severely over-programmed and fail to deliver on the commitments they have made. As a result, agencies now find

themselves in one of the following categories with respect to their need to “re-program” to reflect current revenue and project cost realities:

- **Agencies with Balanced Programs**—A limited number of agencies have not experienced major budget shortfalls or have taken particularly conservative approaches to programming (thus, there is no need for re-programming).
- **Agencies Requiring Minor Changes**—Many agencies have dealt with their programming issues through minor adjustments, such as breaking projects into additional phases or by sliding projects out a year or two.
- **Agencies Requiring Major Changes**—A few agencies have recognized the need to significantly scale back their programs by postponing or de-programming projects.
- **Agencies in Denial**—Several agencies are over-programmed (either in STIPs/TIPs or project-specific plans), but have yet to formally recognize and/or try to address their problem.

2.2.6 Challenges Delivering Special Programs and Mega-Projects

Over the past two decades, a number of states have tied transportation funding increases to the implementation of special construction programs—often for building new four-lane highways. In many instances, these programs have created significant program delivery challenges for transportation agencies that include the following:

- **Cost Overruns**—The original cost estimates for completion of many of these programs have proven significantly low, leading to stakeholder and citizen perceptions that the program overruns are due to mismanagement by the responsible agencies.
- **Schedule Delays**—In part due to cost overruns, but also resulting from the increased complexity and requirements associated with project development, a majority of special construction programs experience significant delays.
- **Program Rigidity**—Special construction programs frequently are comprised of projects and facilities that were selected and promised to the public more than a decade ago. In many cases, the project comprising the program and the dedication of specific funding has been established through legislation. As a result, agencies may have limited ability to change the projects within a special program or shift dedicated program resources to newly emerging priorities.

The proliferation of mega-projects (e.g., projects over \$500 million) is creating project delivery challenges similar to those associated with special programs. As exemplified by Boston’s “Big Dig” and Virginia’s “Mixing Bowl,” large projects tend to include a high number of unknown factors that increase the risk for scope creep, cost overruns, and schedule slippages. When project costs escalate and schedules slip, agencies are typically left with little option other than to shift resources from other priorities and programs. Because of both the enormous cost and the high degree of risk associated with these types of projects, many agencies have avoided starting them, but have reached (or will soon reach) a point where addressing the needs can no longer be delayed.

2.2.7 Excess Cash Balances and/or Dangerously Low Balances

While it is instinctive to focus on the concern of having too little cash on hand, state DOTs actually commonly face the challenge of having both too little and too much cash available. As a symptom of