SCAN TEAM REPORT

Scan 08-01

Best Practices In Managing STIPS, TIPS, And Metropolitan Transportation Plans In Response To Fiscal Constraints

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National Cooperative Highway Research Program

The information contained in this report was prepared as part of NCHRP Project 20-68A U.S. Domestic Scan, National Cooperative Highway Research Program.

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The purpose of each scan and of Project 20-68A as a whole is to accelerate beneficial innovation by facilitating information sharing and technology exchange among the states and other transportation agencies and identifying actionable items of common interest. Experience has shown that personal contact with new ideas and their application is a particularly valuable means for such sharing and exchange. A scan entails peer-to-peer discussions between practitioners who have implemented new practices and others who are able to disseminate knowledge of these new practices and their possible benefits to a broad audience of other users. Each scan addresses a single technical topic selected by AASHTO and the NCHRP 20-68A Project Panel. Further information on the NCHRP 20-68A U.S. Domestic Scan program is available at

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Disclaimer

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Abbreviations and Acronyms

AASHTO	American Association of State Highway and Transportation Officials
AC	Advanced Construction
AMPO	Association of Metropolitan Planning Organizations
CAMPO	Capital Area Metropolitan Planning Organization (Texas)
CCMPO	Chittenden County Metropolitan Planning Organization (Vermont)
CDOT	Colorado Department of Transportation
CDTC	Capital District Transportation Committee (New York)
CFO	Chief Financial Officer
CMAQ	Congestion Mitigation and Air Quality
CPMS	Comprehensive Program Management System (Kansas)
CTP	Comprehensive Transportation Program (Kansas)
DOB	Division of Budget (New York)
DOT	Department of Transportation
ESTIP	Electronic State Transportation Improvement Program
FC	Fiscal Constraint
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
HGAC	Houston-Galveston Area Council (Texas)
HREG	Highway Revenue Estimating Group (Kansas)
ISTEA	Intermodal Surface Transportation Efficiency Act
KDOT	Kansas Department of Transportation
MARC	Mid-America Regional Council (Missouri)
MoDOT	Missouri Department of Transportation

MPO	Metropolitan Planning Organization
NEPA	National Environmental Policy Act
NYMTC	New York Metropolitan Transportation Council
NYSDOT	New York State Department of Transportation
OA	Obligation Authority
PPACG	Pikes Peak Area Council of Governments (Colorado)
PSRC	Puget Sound Regional Council (Washington)
RPC	Regional Planning Committee (Vermont)
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SCOP	Standing Committee on Planning (AASHTO)
STIP	State Transportation Improvement Program
TEA-21	Transportation Equity Act for the 21st Century
TIP	Transportation Improvement Program
TMA	Transportation Management Area
TRB	Transportation Research Board
TRPC	Thurston Regional Planning Council (Washington)
TxDOT	Texas Department of Transportation
USDOT	U.S. Department of Transportation
VTrans	Vermont Department of Transportation
WAMPO	Wichita Area Metropolitan Planning Organization
WSDOT	Washington State Department of Transportation
YOE	Year of Expenditure
PDA	Pile-driving analyzer
PIO	Public Information Officer
PRS	Pavement rehabilitation strategy; performance related specification
PS&E	Plans, specifications, and estimate
RFP	Request for proposals

RO/RI	Roll-out/roll-in
ROW	Right-of-way
SFOBB	San Francisco-Oakland Bay Bridge
SOC	Subcommittee on Construction (AASHTO)
SP	Steel pipe
SPMT	Self-propelled modular transporter
STIP	Statewide Transportation Improvement Program
TCP	Traffic control plan
TIP	Transportation Improvement Plan
TRB	Transportation Research Board
TxDOT	Texas Department of Transportation
UDOT	Utah Department of Transportation
VE	Value Engineering
WSDOT	Washington State Department of Transportation

Executive Summary

Overview

With the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, federal fiscal constraint requirements for the first time became a significant element of the transportation planning process for state departments of transportation (DOTs) and Metropolitan Planning Organizations (MPOs). After 1991, federal guidance evolved over the years until publication of the February 2007 Final Rule on statewide and metropolitan transportation planning and programming. The Final Rule, in addition to addressing fiscal constraint, added the requirement that approved plans and programs express costs in terms of Year of Expenditure (YOE). The Federal Highway Administration (FHWA) followed these regulations with additional policy guidance in April 2009 in the form of questions and answers.

Since 1991, both states and MPOs have expressed concerns about the way in which fiscal constraint is defined and applied. The draft rule received a large volume of comments and criticism from around the country. The major concerns were:

- The resources required to manage fiscal constraint and the potential loss of focus on other important planning objectives
- The requirement for fiscal balance *by year* rather than over *the life* of a plan or program
- The conflict created between fiscal constraint and need for a visionary long-term plan that may consider options unconstrained by known resources
- Its value in a time of extreme price volatility and uncertainty about future federal revenues

Several peer exchanges, a national scan, and a white paper supported by the American Association of State Highway and Transportation Officials (AASHTO) published in 2008 demonstrate the importance of this subject to the transportation community. Many states expressed interest in learning more about how others are complying with the recent regulations.

As a result, this scan was initiated to identify some of the best practices that states and MPOs are using to comply with current law and regulation. The scan team identified the following states to visit and thoroughly review their approach to achieving fiscal constraint and YOE compliance:

- New York (NYSDOT)
- Vermont (VTrans)
- Kansas (KDOT)
- Missouri (MoDOT)

- Colorado (CDOT)
- Texas (TxDOT)
- Washington (WSDOT)

These states are geographically diverse, and they vary in the size and complexity of their transportation programs. Several have been active in national and regional efforts to address the compliance concerns of the states.

In addition, the scan team also met with selected MPOs in these states to identify best practices in a diverse sample of MPOs, including Transportation Management Areas (TMAs), non-TMAs, and those in air quality nonattainment or maintenance areas. These MPOs include:

- New York Metropolitan Transportation Council (NYMTC) (New York, NY)
- Capital District Transportation Committee (CDTC) (Albany, NY)
- Chittenden County Metropolitan Planning Organization (CCMPO) (Greater Burlington, VT)
- Mid-America Regional Council (MARC) (Kansas City, MO)
- Pikes Peak Area Council of Governments (PPACG) (Colorado Springs, CO)
- Houston-Galveston Area Council (HGAC) (Houston, TX)
- Capital Area Metropolitan Planning Organization (CAMPO) (Austin, TX)
- Thurston Regional Planning Council (TRPC) (Olympia, WA)
- Puget Sound Regional Council (PSRC) (Seattle, WA)

The scan team also reviewed written responses to its amplifying questions (see Appendix A) provided by the Wichita Area Metropolitan Planning Organization (WAMPO) (Wichita, KS).

While the scan team identified best practices in both the states and MPOs it reviewed, it is important to note that the team, following its site visits, has concluded that *numerous variables will usually determine which practices are applicable, practical, or even effective in an individual state or MPO.* Size, complexity, governmental structure, and interagency relations all help determine practices that help states and MPOs comply with fiscal constraint and YOE. Not all practices will have value everywhere. Nevertheless, certain of the best practices identified could be adapted and applied in appropriate ways so that many states and MPOs could benefit.

The scan team has also established two distinct categories for its recommendations. They are:

1. Best practices that, even if modified when applied to an individual state or MPO, might assist them more effectively *comply with existing federal requirements for fiscal constraint and YOE* while, at the same time, enhance overall management of MPO long-range plans, Transportation Improvement Programs (TIPs), and state TIPs (STIPs).
2. Approaches that *may require a change in existing statute and/or regulation that could*

better accomplish the overriding objectives for these financial requirements while preserving, protecting, and reinforcing the importance of other planning and programming functions.

Fiscal Constraint and YOE Objectives

The fiscal constraint requirements are intended to ensure that metropolitan transportation plans and programs can be delivered within estimated or reasonably anticipated revenue levels, ensuring that they do not represent mere wish lists. These requirements also support transparency between the states, MPOs, and the public regarding both revenue and cost estimates, thus ensuring the ability to hold MPOs and the states accountable for transportation commitments.

YOE, the mostly recent added requirement, is intended to acknowledge the relationship between reasonably projected growth (or lack of growth) in revenues and the potential impact of future inflation on project costs. YOE is also designed to help ensure consistency in project cost estimating between the scoping, project development, and design phases. Historically, this hand-off has often resulted in significant increases in cost estimates, often the result of major scope changes made during the design phase. Further, inflation has often been handled inconsistently at different phases of a project's development, making it difficult to compare cost estimates during the life of a project.

Finally, the final rule requires that TIPs and STIPs demonstrate "with reasonable assurance that the federally supported transportation system is being adequately operated and maintained." This is intended to ensure that federal investments in the federally eligible system are protected with an appropriate commitment to operating and maintaining this critical system.

Fiscal Constraint and YOE Requirements: State and MPO Reactions

The scan team's findings on state and MPO concerns regarding the current application of fiscal constraint and YOE requirements are consistent with earlier national efforts to assess the federal approach. All of the states and MPOs that the team visited or reviewed endorse fiscally constrained short-term plans and programs. Everyone advocates that short-term plans and programs should represent realistic expectations about what can be delivered and that they should be maintained in reasonable fiscal balance for their duration. Most, but not all, of the states and MPOs did not view the requirements for fiscal constraint as overly burdensome. Views differed, in part, based upon the flexibility afforded by the federal agencies.

For example, a state such as Vermont, with a smaller and more centralized programming approach, expressed no concern at all with current requirements governing fiscal constraint and YOE. While some, particularly those with larger and more complex programs, believed that the federal TIP and STIP amendment requirements were burdensome, others concluded that the regulations provided ample flexibility for the states and MPOs to efficiently act upon necessary changes.

Nevertheless, states and MPOs express almost universal concern over the trend in recent years to turn long-range metropolitan plans, TIPs, and STIPs into *"accounting" documents. Some argue that long-range metropolitan plans should provide a vision for the future, which might be compromised by focusing on fiscal constraint.* A few even note that these requirements have contributed to a decline in the hiring of professional transportation planners in the MPOs and an increase in the hiring of fiscally oriented and administrative staff.

While the states and MPOs generally conclude that recent guidance on the application of YOE to project costs has helped clarify options for compliance, there was virtually unanimous agreement that the use of YOE in metropolitan plans, especially beyond the first 10 years, substantially exceeds their ability to forecast project cost inflation and revenue far into the future. They would like relief from this requirement, in part, because these plans are updated regularly enough to adjust longer range revenue forecasts.

In addition, while most conceded that the risks of inadequate revenue growth and cost inflation should be recognized in the near-term TIPs and STIPs, some argued that individual project cost estimates in the later years of these programs often include projected inflationary impacts. Therefore, they argued that further application of across-the-board inflation is duplicative and inappropriate. Others argued that the expression of project costs in constant dollars is a reasonable methodology for achieving transparency while still allowing for acknowledgment of inflationary threats. They contend that the public more easily understands costs expressed in terms of constant dollars rather than costs reflecting years of forecasted compounding inflation rates, especially in long-range plans, where compounding impacts are most acute.

All states and MPOs agree that the federal aid system should be adequately operated and maintained, but are concerned that existing revenue levels may not be sufficient. They are also concerned with the vagueness of these objectives and their ability to demonstrate compliance.

All states and MPOs are also currently struggling with uncertainty regarding current and future federal funding levels. This uncertainty compounds the difficulty of determining fiscal constraint. Finally, all states are presently experiencing sharp declines in state and local revenues supporting transportation. Because of this, some previously approved TIPs and STIPs have become fiscally unbalanced, which will affect their ability to deliver committed programs and heighten the challenge to comply with fiscal constraint.

While states and MPOs have most recently experienced a moderating trend in the inflation rates for critical materials used in construction, the ongoing volatility of these prices makes any effort to project future inflation rates difficult, particularly for long-range plans.

Factors Impacting State and MPO Approaches to and Compliance with Fiscal Constraint and YOE

Best practices for the purposes of this scan are defined as follows:

- Approaches and/or tools that *assist a particular state or MPO to successfully comply with fiscal*

constraint and YOE requirements

- Approaches and/or tools that also represent *good management techniques for meeting the broader objectives of plans and programs while effectively complying with federal fiscal requirements*

The scan's inclusion of any individual best practice is not intended to imply that it is always the preferred means for achieving compliance. Therefore, it is important to emphasize the following factors, which often determine a given state's or MPO's approach to ensuring fiscal constraint. The success of certain approaches or best practices often hinges on the following:

- *The sheer dollar size of the state's or MPO's program and the number of transportation operators* impact both the development and implementation of plans and programs. The volatility in costs and schedules, which adds to the need for amendments, appears to be somewhat related to size and complexity.
- *The working relationship and degree of trust between a state and its MPOs* are important factors in effective fiscal management. *The quality of communication between the state and MPOs* and the consistency *of information sharing* also help determine the ease with which they able to comply with federal requirements.
- *The working relationships of both the states and MPOs with their FHWA divisions and Federal Transit Administration (FTA) regions* are also critical in facilitating compliance. Those states and MPOs that have worked with their respective federal partners *to effectively utilize the available flexibility provided by the planning regulations* are clearly better positioned to meet fiscal constraint requirements.
- *Cooperation between the two respective federal agencies* is also important to effective planning and programming in a given state or MPO.
- *Individual state funding mechanisms for transportation and the role of the legislature, governor, and, in some cases, a transportation commission,* may encourage certain practices for managing fiscal constraint that are not appropriate for another state.
- *The degree to which state law imposes additional requirements for achieving fiscal constraint* may also help to determine which practices are most effective for that state. Specific state legislative requirements may require steps that are not useful and may possibly be prohibited in other states.
- *The relative importance of federal highway and transit funding to state and local funding, including tolls*, is another factor that needs to be considered. For many states, the federal share of their highway and transit programs is declining as a percentage of their total program.

Because these factors affect states and MPOs differently, *the scan team concludes that one size does not fit all when it comes to best practices.*

Methodology for Scan Visits

The scan team reviewed five major areas with each of the sites it visited:

- The role of organizational structure and state context
- Approaches to revenue estimates for plans and programs
- Approaches to cost estimates, which establish the management and technical processes for cost estimation throughout the life of a project
- Methods for ensuring fiscal constraint during the development phase of plans and programs
- Methods for ensuring fiscal constraint throughout the implementation phase of approved plans and programs

The Role of Organizational Structure and State Context

DOT organizations, particularly their placement of planning and program management, are strikingly similar. The role of the chief financial officer (CFO) does vary in terms of responsibility for managing the program, especially the STIP; however, no matter this office's placement, it plays a critical role in the areas that impact fiscal constraint. *Clearly, a strong working relationship and good communications between planning, programming, finance, and cost estimating are crucial to effective compliance with fiscal constraint*. A few states (e.g., Washington and New York) have created a discrete local programs management office, which appears to play a positive role in promoting local project delivery.

The larger context in which DOTs and MPOs operate in their respective states varies significantly and plays some role in their approach to fiscal management. For example, some state legislatures play a major role in approving transportation programs and overseeing any major changes. In others, a transportation commission can make program decisions with little if any role for the legislature or governor. Still other DOTs report directly to the governor. Colorado has its own state law requiring fiscal constraint, which impacts CDOT's approach to fiscally managing its transportation programs.

The MPOs that were examined also reflected differing approaches to membership, voting procedures, and organizational structure. For example, while MPO voting membership generally includes local elected officials, transit operators, and state DOTS, Texas also includes legislative representation, and CDOT sits on only one of its five MPO policy boards. Some use weighted voting while others, such as New York, use consensus voting. The exact role of policy boards and planning or technical committees differed between MPOs, but without significant impact on fiscal constraint. All articulated the importance of close working relationships between MPOs and the state DOTs as being essential to sound transportation planning and fiscal management.

Approaches to Revenue Estimating

The states and MPOs use very different approaches to estimating future revenues. All agree

that estimating is more art than science and that current methodologies can be improved upon. As stated above, all states and MPOs confront large gaps between existing revenues and defined transportation system needs and are seriously concerned about two realities:

- Future federal funding is uncertain at best, with new revenue needed just to maintain current funding levels.
- State transportation revenues have sharply declined because of the national economic recession and the growth limitations inherent in the nature of motor fuel taxes, which most states rely upon.

Both factors are contributing to financial instability in long-range plans and, perhaps, inhibiting the visionary planning that many feel is essential. Universally, the severe revenue shortfalls are forcing states to increase focus on infrastructure maintenance and rehabilitation and to commit less to needed facility expansion. Shortfalls are especially impacting some TIPs and STIPs that recently have become fiscally imbalanced almost immediately upon approval. While all concur that fiscal constraint is an important objective, the current situation has made compliance efforts more challenging.

There is also wide variation among states in their approaches to revenue estimation and applying these estimates uniformly among their MPOs. Several states are reviewing their current revenue estimation procedures, and others reflect best practices that might be applicable to other states. All of the selected states and MPOs take what they consider conservative approaches to revenue forecasting, particularly in the current economic climate. Many are concerned that this approach may not prepare them to obligate any unanticipated revenue increases, which have surprised states in the past.

Bonding of state revenues is common, with state legislatures generally establishing limits to the amount permitted. Several states expressed concern that future debt service requirements were adversely impacting the availability of future revenues for their programs, hence contributing to revenue shortfalls.

Each of the states visited maintains the importance of the *DOT playing a significant role in forecasting transportation revenues, especially federal revenues.*

Examples of best practices in revenue estimating include:

- States such as Kansas, New York, and Washington have centralized revenue estimating organizations. KDOT participates on the state's Highway Revenue Estimating Group (HREG) along with the Department of Revenue & Legislative Research, relying upon both historical and current data for state revenues. New York State's Division of the Budget, reporting to the governor, is responsible for the governor's overall revenue estimate; however, NYSDOT's CFO also has the capability of estimating future state and federal transportation revenues for upcoming TIPs and the STIP. Washington DOT's CFO sits on the state's Revenue Council, a separate state agency for overall revenue forecasting. The DOT does play a major role on that council forecasting transportation revenues.

- MoDOT is one of the few state DOTs to hire a staff professional economist to assist in revenue forecasting.
- Colorado uses a committee, including members of its transportation commission and its MPOs, to establish a consensus revenue forecast and requires that CDOT and the MPOs utilize it.
- TxDOT has carried out revenue forecasting in its finance division, with MPOs permitted to develop their own individual forecasts. However, Texas is now initiating a statewide effort, cooperatively with its MPOs, to develop a uniform approach throughout the state on future forecasts.
- Longer term revenue forecasting for MPO metropolitan plans presents a special challenge, considering the greater uncertainties in beyond year 10. CDTC and PSRC both work with their state DOTs, but are also good examples of proactive MPOs trying to marry realistic revenue forecasting with the visioning purpose of their plans. PSRC has developed its own models to forecast revenue in its region.

Approaches to Cost Estimating

All of the states and MPOs reviewed by this scan acknowledge that poor project cost estimating and cost volatility during a project's lifetime present major challenges for fiscal management. Through long-established project scoping and design procedures, state DOTs, in particular, have substantial experience with this critical issue. Several of them believe that their estimating procedures are working well and that cost increases are managed effectively to minimize impacts on fiscal constraint.

For some, however, unanticipated cost increases continue to drive the need for amendments, especially to TIPs and STIPs. Unusually high inflation rates for key construction materials (e.g., concrete, steel, and asphalt) have recently contributed to bid prices well in excess of estimates, even those that included some amount for contingencies. While these rates have moderated, price volatility is likely to continue fiscal uncertainty in future transportation planning and programming.

DOTs have generally placed responsibility for cost estimation during design under their Chief Engineer. They all have established databases regarding recent experience with unit costs and various types of pavement and bridge rehabilitation strategies. Nevertheless, with the notable exception of MoDOT, which uses a concept-through-construction-management strategy and a one or two others, most DOTs expressed ongoing concern over their ability to fully control unanticipated project cost increases during the design phase, as well as at contract letting and award.

Examples of best practices in cost estimating include:

- Renewed focus on improving the scoping phase to develop more complete scopes with more accurate cost estimates. Washington, in particular, is giving special attention to scoping for larger and more complex projects.

- Project costs are regularly updated for TIPs, STIPs, and long-range plans.
- Updates to cost estimates are coordinated between program offices within a DOT as appropriate (i.e., planning, bridge, ROW, design, construction, finance, and National Environmental Policy Act [NEPA]).
- Program and project management principles are applied, in part, to control cost increases throughout a project's life. Colorado, Washington, and Missouri, in particular, have installed rigorous project management approaches to control scopes and costs with great success. Using cost-estimating teams that include all critical functional groups within a DOT (e.g., planning, design, maintenance, environment, and construction) facilitates cost control efforts.
- New York, which has faced substantial unanticipated cost increases in recent years, particularly on large, complex projects, has reviewed its cost estimating procedures and is increasing the use of risk management and performance measurement, as well as newer automated project management systems, to improve cost control.
- Washington assists local governments with project estimates to improve their estimating, an area that is of significant concern for many state DOTs.

Approaches to Metropolitan Plan, TIP, and STIP Development

Compliance with fiscal constraint and YOE requirements comprises only one important element among many that contribute to successful development of metropolitan plans, TIPs, and STIPs. States and MPOs use widely varying time periods, update cycles, and approaches to developing these plans and programs, but universally they utilize methods that encourage *public involvement and transparency*.

Best Practices in Metropolitan Plans

Some MPOs are including *all sources of transportation funding* in their plans' revenue and cost estimations, not just federal funds. This provides a comprehensive foundation for establishing fiscal constraint in the plans as well as the TIPs, which flow from them. Certain MPOs, such as the CCMPO, have simply straight-lined future federal revenue increases based upon historical data and applied a percentage inflation rate uniformly to its plan and TIP.

Other best practices in addressing fiscal constraint and YOE include:

- The Colorado Transportation Commission, relying upon CDOT, provides policy- and corridor-based guidance for the MPO plans as well as for the state's 10 rural planning districts. This guidance, in part, seeks to achieve consistent approaches to fiscal constraint and YOE at the local planning level.
- PSRC, after settling its revenue forecast, works closely with operators on developing the cost side of its plan. A cost/benefit analysis of the entire system helped determine the most cost-effective investments.
- TRPC includes only regionally significant projects and programs in its plan. The operator, who

works closely with the council, prepares the estimates for these projects.

- WAMPO is developing project selection criteria for its 2035 plan to assist members to establish priorities within very tight revenue projections.
- CDTC, in light of severe revenue constraints and high inflation rates, has recently adopted a new approach for its 2030 plan in which it identified a minimally acceptable plan for infrastructure rehabilitation, together with only modest investments in system enhancement. The plan is described as fiscally balanced over the 20-year period, but only if public funding increases regularly over the next 25 years as it has in the past.
- Some, but not all, MPOs are using the flexibility to estimate project costs beyond 10 years with cost ranges or bands.
- All of the MPOs the scan team reviewed struggle with YOE, and some prefer to use constant dollars, especially for their plans. Most have established YOE compliance utilizing the flexibility afforded by FHWA and FTA.

Best Practices in MPO TIPs

Clearly, fiscal constraint requirements have largely eliminated excessive over-programming and, hence, the inability to deliver upon project commitments that had been common prior to ISTEA. Unfortunately, today's steep revenue declines and ongoing project cost volatility continue to adversely impact programs. This scan reinforces the view that strong working relationships between MPOs and their member state and local agencies are critical to the entire planning process, including TIP development.

Most MPOs work closely with their respective DOTs to develop the fiscal constraint parameters for their TIPs. Examples of best practices for developing constrained TIPs and applying YOE include:

- While TIP update cycles vary, they are generally coordinated with more comprehensive statewide program updates and production of the STIP. NYSDOT presents one effective means for preparing a rolling five-year statewide program on a two-year cycle that is tied closely to MPO TIP updates. The CDTC provides an example of an MPO programming all federal funds within priority categories; other MPOs are only responsible for competitively programming certain funds, such as Urban STP and Congestion Mitigation and Air Quality (CMAQ).
- To reinforce the current fiscal constraint, states are generally *assuming federal revenue available for a TIP or STIP at the anticipated level of Obligation Authority (OA) rather than at the authorized levels.*
- The legislature has approved Kansas' current but expiring statewide program (1999–2009), including project listings. The Comprehensive Transportation Program (CTP) is a 10 year transportation program that largely drives the TIP update of MPOs like MARC.
- Many MPOs, including CCMPO, CDTC, and others, only place projects on a new TIP that are clearly ready to proceed. In Vermont, since the state develops most projects for the

CCMPO TIP, the MPO plays only an advisory role in project selection for the TIP within fiscal constraints.

- TRPC's efforts to establish fiscal constraint in a new TIP includes placing an appendix in the TIP specifically listing projects that cannot be funded within existing revenues. It then completes the public review and comment for these projects so that they can readily be added through amendment, should funding become available.
- Most states develop inflation rates to express projects in YOE, and the MPOs generally adopt them for their new TIPs. PSRC, however, uses its flexibility on applying inflation because many project estimates already include projected inflation.

Best Practices in STIPs

Under federal law, the STIP remains as the primary mechanism for authorizing projects using federal funds. Many states include all funds in their STIP. States like New York, with the exception of the Metropolitan Transit Authority, which also includes locally funded projects that serve as a match to federal aid, lists projects with non-federal funding for information only. There is significant variation in how states develop and utilize the STIP. Because the state DOTs play a major role in both revenue and cost estimating, STIPs by and large are both fiscal constraint and YOE compliant when approved by FHWA and FTA.

Examples of best practices in STIP development and use include:

- KDOT uses its official, legislatively approved Comprehensive Transportation Program to develop its STIP directly. Unlike other states, KDOT's STIP only includes individual TIPs by reference.
- The FHWA New York Division, in cooperation with NYSDOT personnel, developed NYSDOT's Electronic State Transportation Improvement Program (ESTIP). The four downstate MPOs have used it to develop the TIPs and manage the STIP in these areas. NYSDOT now houses and manages the ESTIP. In addition, access to ESTIP was recently expanded to the upstate MPOs and the NYSDOT regional offices, for the rural portions of the STIP. NYSDOT intends to use it statewide to develop the next STIP.
- WSDOT has an electronic system for STIP development and is developing a new one for future use. All MPOs, with the exception of PSRC, directly input to this system.
- CDOT coordinates STIP development with budget development to ensure that the first year of the STIP precisely mirrors the fiscal constraint reflected in the annual state budget and to comply with state law requiring fiscal constraint.
- Most states use a rolling multiyear STIP updated annually or biennially to keep the program current.
- Most states apply an inflation rate determined by their own methodology to achieve YOE compliance.

Approaches to Metropolitan Plan, TIP, and STIP Implementation and Management

This area presents states and MPOs with the biggest challenges in fiscal constraint compliance. Consequently, the scan team spent the greatest amount of time reviewing state and MPO practices in this area.

The volatility in TIPs and STIPs, in particular, results in the need for changes to project costs and schedules, as well as the addition of new projects. Metropolitan plans require changes less frequently, and, therefore, present far less of a challenge. The number of amendments and administrative actions that MPOs and DOTs take for TIPs and STIPs varies widely. Large, complex MPOs, such as NYMTC, require hundreds of actions each year, while smaller MPOs and states may only require a handful. MPOs vary the frequency of amendments, generally from daily to at least quarterly.

Requirements for public review combined with the state and federal reviews result in a delay of several months before an amendment may ultimately be approved. Despite these challenges, almost all DOTs and MPOs reviewed maintained that they were managing fiscal constraint effectively.

Example of best practices include:

- Most states and MPOs work closely with FHWA and FTA to maximize the flexibility to utilize a streamlined administrative process, rather than more formal amendments, to accommodate routine or minor changes.
- Plans are generally amended less frequently, sometimes only annually.
- PSRC addresses fiscal constraint in its approved plan by performing regular updates and annual amendments rather than waiting for the lengthy process of developing a new long-range plan.
- Among the states that the scan examined, only CDOT uses the STIP as its sole program management tool, including ensuring that the transportation program remains fiscally constrained during its lifetime. CDOT provides FHWA weekly reconciliation reports on STIP changes and daily reports on its website.
- *Program and project management*, strongly supported by executive management and best illustrated in MoDOT, is an essential element to maintaining fiscal constraint. MoDOT's project scope and cost control efforts and use of innovative contract bid practices have minimized the need for changes to the STIP, with only a small number of amendments requiring approval by the transportation commission.
- KDOT is committed to effective program and project management, relying heavily upon its Comprehensive Program Management System (CPMS) to track and manage projects. An updated CPMS is nearing completion.

- WSDOT's use of *performance management techniques* has helped to control scopes and costs in its program. While The Grey Notebook is used largely to demonstrate accountability to the legislature and transportation stakeholders, it is also the foundation for using *performance measures, in part*, to manage WSDOT's program fiscally.
- CDOT's and WSDOT's efforts to *improve project scoping* have also decreased cost volatility.
- Several states (e.g., WSDOT, NYSDOT, MARC, and WAMPO) control the local side of their TIPs and STIPs by either working closely with local governments on cost estimating or *capping the amount of federal aid available for a local project* to the amount approved in the original program.
- NYMTC's use of the *ESTIP to manage TIP amendments* assists greatly in tracking the many changes in its program and electronically facilitating the member balloting procedure to expedite approval of amendments. NYMTC staff plays a constructive role in assisting their member operators to identify cost offsets to their own amendments.
- NYSDOT is using ESTIP to keep a current version of STIP available on its website.
- Vermont, CDTC, and others make an effort to place projects on a STIP or TIP only after they are funded and clearly ready to proceed.
- CDOT does not repeat the public review process that is used for TIP amendments when it amends its STIP, a significant time saver in processing amendments.
- All states that the team visited utilize Advanced Construction (AC) to help manage cash flow and the use of annual OA; some have established guidelines for its use. Most states are not yet showing the impact of AC on STIP fiscal constraint. NYSDOT does show which federal funds will be obligated for a project's AC, once it is converted.

Preliminary Recommendations for Improved Compliance with Fiscal Constraint and YOE within Current Law and Regulation

The best practices identified in this report assist states and MPOs to comply with existing federal requirements. Many of these practices also facilitate the inevitable changes that must be made, especially to TIPs and STIPs. Below are listed some of what the scan team found to be especially important practices or strategies that, however modified or applied in a given state or MPO, may result in improved compliance with existing statutes and rules and management of transportation plans and programs. The most important of these include:

- Wherever transportation planning, programming, project cost estimating, and fiscal management are housed in a specific DOT, strong linkage and communication between cost estimating and revenue forecasting throughout the life of the program aids the seamless exchange of this critical information.
- Revenue and project cost estimation need strong central leadership in each DOT so that fiscal discipline is maintained.

- It is beneficial when revenue and cost estimation methodologies and guidelines are shared, and preferably developed jointly, with MPOs. It is also beneficial when MPOs have the necessary flexibility to respond to different revenue and cost factors in their own regions. Some degree of uniformity is helpful, but local circumstances should guide estimates.
- *Comprehensive program and project management systems, backed by strong executive leadership*, are important to control not only fiscal constraint, but also the overall quality of the delivered program. Control of project cost and scope volatility is valuable in avoiding continual changes to plans and programs.
- Communication with and outreach to the public and stakeholders regarding the realities of available revenues and the reasons for any necessary project amendments help maintain fiscal discipline and credibility for transportation programs with the authorizing entities and the public.
- States and MPOs can limit the administrative burden imposed by fiscal constraint requirements if they are allowed to utilize the flexibility provided in current law and regulation fully and work closely with their federal partners.
- Fiscal constraint objectives should not be allowed to turn TIPs, STIPs, and, in particular, long-range plans into accounting documents that unduly reflect a focus on only one of many important planning objectives.
- The application of YOE should be monitored and adjusted to ensure that inflation rates are not unnecessarily distorting future project costs, particularly in long-range plans. While a uniform inflation rate across a particular state might be simple, it might also be inappropriate for a specific region.

Preliminary Recommendations for Alternative Approaches to Fiscal Constraint and YOE That May Require Change to Current Law and Regulation

Based on the information this scan gathered, the scan team supports the need for transparency and accountability in aligning program costs, delivery times, and funding to support STIPs, TIPs, and long-range plans. The team also supports the implementation of STIPS, TIPS, and long-range plans as consistently as possible, with the original information shared with the public. All agree that the U.S. Department of Transportation (USDOT) has a legitimate and constructive interest in ensuring fiscal integrity, transparency, and accountability in the expenditure of federal funds. This scan also concludes that adaptation of some of the best practices described in this report will facilitate state and MPO compliance with existing law and regulation.

The team believes that there may be alternative means for achieving these same objectives that may be worthy of further examination, while also reinforcing the principle that plans and programs fundamentally serve as the key documents for demonstrating fiscal constraint. The following alternatives are worthy of further consideration; to be enacted, they may require

changes in statute and regulation. They may also address some of the fundamental concerns that have been expressed regarding current law and regulation. Some of these alternatives reinforce the importance of visionary and fiscally responsible transportation plans and programs that are responsive to transportation needs and preferred outcomes. These alternatives include:

- Removing the requirement that TIPs and STIPs be fiscally balanced by year. Many states believe that this provision is too inflexible for managing large and complex programs and that fiscal balance over the *duration of the program* is more reasonable and as valuable in achieving the objectives of fiscal constraint.
- Drawing upon the transportation community's growing national interest in encouraging greater use of *performance and systems management strategies (including effective use of performance measures)* for achieving fiscal constraint. These strategies would direct concerns to *outcomes rather than processes for achieving the objectives*. The federal role could be one of providing broad goals, best practices, and funding, leaving specific measures and targets to the states and MPOs. There are a wide variety of ways to carry out this approach, but a few might include:
  - Creating flexibility and incentives *commensurate with the ability of states and MPOs to demonstrate quality control on fiscal constraint*
  - Providing a framework for DOTs and, as appropriate, MPOs, to enhance their own *performance management* system that, among other objectives, demonstrates their ability to develop and maintain fiscally constrained plans and programs
  - Providing a framework for states to demonstrate that they have *management systems and strategies* to adequately operate and maintain the federal aid system, consistent with the funding levels provided
  - Allowing the states and MPOs to have the flexibility to rely upon an administrative process for managing plans and programs, so long as their performance management approach demonstrates reasonable fiscal accountability; a possible exception might be nonexempt project amendments in air quality nonattainment or maintenance areas
- Allowing *periodic* (e.g., quarterly or some other reasonable period) *demonstrations* of fiscal constraint instead of project-by-project demonstrations; this would not apply to changes affecting nonexempt projects in air quality nonattainment areas.
- Eliminating or limiting the YOE requirement while still requiring that DOTs and MPOs assess the potential risk that future revenues may not keep up with inflationary cost increases. Metropolitan plans, TIPs, and STIPs should be required to provide an assessment of these risks, perhaps even to suggest potential impacts under specific scenarios. However, they could, if so desired, express project costs in present value terms.
- Eliminating applying YOE to metropolitan plans, at the very least beyond year 10 of the

plan and requiring plans to address, at least with narrative, the risks of future inflation and revenue shortfalls.

Planned Implementation Activities

The scan team's approach to implementation of its findings and recommendations will be designed to inform AASHTO, the Transportation Research Board (TRB), state DOTs, and MPOs of the best practices that were identified in the study, including the major recommendations for effective ways to comply with current federal requirements.

In addition, through outreach to AASHTO's Standing Committee on Planning (SCOP), the team intends to provide its recommendations, especially those that may entail statutory and regulatory changes, so that they can be used to help shape transportation reauthorizing legislation due in late 2009. Some of these recommendations will require further study or research. Various forms of communication will be considered, including:

- Presentations to SCOP and perhaps AASHTO's Executive Committee, TRB, and the Association of Metropolitan Planning Organizations (AMPO)
- Presentations to FHWA and FTA
- Webinars for state DOT and MPO participants

CHAPTER 1

Overview

Objectives

Since the passage of ISTEA in 1991, federal transportation regulation has increasingly emphasized the importance of developing transportation plans and programs that are financially achievable and reflect financial resources that can reasonably be expected to be available. The fiscal constraint requirement was in large part a reaction to many MPO plans and TIPs having served as wish lists: they were substantially over-programmed, with insufficient revenue to support all of the projects.

Federal regulations and policy statements regarding the necessity for plans and programs to reflect fiscal constraint evolved between 1991 and 2007, when the Final Rule on statewide and metropolitan a planning and programming was published in the *Federal Register* on February 14, 2007; it became effective on March 16, 2007. These most recent regulations added a further requirement that MPO and state plans, TIPs, and the STIP be expressed in terms of YOE to reflect anticipated inflation in future years. The Final Rule also required that TIPs and STIPs demonstrate, "with reasonable assurance that the federally supported transportation system is being adequately operated and maintained." This is intended to ensure that federal investments in the federally eligible system are protected with an appropriate commitment to operating and maintaining this critical system.

The objectives of these provisions were to encourage enhanced accountability for MPO long-range plans, TIPs, and STIPs by providing greater transparency on both revenue and project cost forecasts and estimates. The YOE requirement is intended to have states and MPOs explicitly acknowledge future risks to revenues and costs due to inflation, as well as to encourage more consistent cost estimates across all phases of project development.

MPO and DOT compliance with federal fiscal constraint requirements has been uneven across the country; at times, the ambiguity of the term fiscal constraint has been problematic for both. Over time, the state DOTs have generally sought greater flexibility from USDOT in attempting to achieve financial transparency in their plans, TIPs, and STIPs. While generally agreeing that plans and programs should be financially constrained and, therefore, realistic, states have argued that federal regulations and policy guidance have exceeded what is required by law and have imposed undue burdens on MPOs and states.

To develop a better understanding of how states and MPOs have responded to these requirements, this scan identifies some of the best practices that have been adopted by selected DOTs and MPOs. These best practices include policy guidance as well as management and technical approaches. Specifically, the scan examines how these DOTs and MPOs develop reasonable revenue and cost estimates for their long-range transportation plans, TIPs, and the STIP, how they monitor project costs and schedules over time to ensure fiscal constraint, and how they respond to project

changes that may result in a loss of constraint for a previously approved program. The scan also explores various approaches to compliance with the new YOE requirement. In addition, this report highlights those best practices that have the potential for broad application across diverse states and MPOs, while acknowledging that individual state and local differences will impact the utility of certain practices.

Finally, this report identifies potential changes to current federal transportation statute and regulation that might offer improved ways for achieving the stated objectives of fiscal constraint and YOE while minimizing the current burdens experienced by states and MPOs.

State DOTs and MPOs Visited

The scan team identified a diverse list of state DOTs and MPOs to visit. This diversity is reflected in their geographic locations and the size and complexity of their respective transportation programs. The selected MPOs represent both TMAs and non-TMAs, as well as air quality attainment and nonattainment areas. The state DOTs included:

- New York (NYSDOT)
- Vermont (VTrans)
- Kansas (KDOT)
- Missouri (MoDOT)
- Colorado (CDOT)
- Texas (TxDOT)
- Washington (WSDOT)

The MPOs visited included:

- New York Metropolitan Transportation Council (NYMTC) (New York, NY)
- Capital District Transportation Committee (CDTC) (Albany, NY)
- Chittenden County Metropolitan Planning Organization (CCMPO) (Greater Burlington, VT)
- Mid-America Regional Council (MARC) (Kansas City, MO)
- Pikes Peak Area Council of Governments (PPACG) (Colorado Springs, CO)
- Houston-Galveston Area Council (HGAC) (Houston, TX)
- Capital Area Metropolitan Planning Organization (CAMPO) (Austin, TX)
- Thurston Regional Planning Council (TRPC) (Olympia, WA)
- Puget Sound Regional Council (PSRC) (Seattle, WA)

In addition, the team reviewed written answers to the amplifying questions (see Appendix A) submitted by the Wichita Area Metropolitan Planning Organization (WAMPO) (Wichita, KS).

Scan Methodology and Focus Areas

The scan team focused on five major areas in its site visits:

- The role of organizational structure and state context
- Approaches to revenue forecasts for plans and programs
- Approaches to cost estimates that establish the management and technical processes for cost estimation throughout the life of a project
- Methods for ensuring fiscal constraint during the development phase of plans and programs
- Methods for ensuring fiscal constraint throughout the implementation phase of approved plans and programs

Scan Team Composition

The scan team possesses extensive experience in multimodal planning, programming, program management, and policy development at both the state and federal levels. Contact information for the team members is available in Appendix B; their biographical information can be found in Appendix C. The team members include:

Timothy A. Henkel	Minnesota DOT, AASHTO Co-Chair
Harlan Miller	FHWA, FHWA Co-Chair
Jeanne Stevens	Tennessee DOT
Ben Orsbon, AICP	South Dakota DOT
Tracy Larkin-Thomason, P.E.	Nevada DOT
W. David Lee, P.E.	Florida DOT
Thomas W. Clash	Subject Matter Expert

State and MPO Reactions to Fiscal Constraint and YOE Requirements

Following the passage of ISTEA, USDOT issued its first planning regulations in 1993, which, in part, addressed fiscal constraint requirements. In the years following publication of these regulations, the department issued various clarifications and further definitions for fiscal constraint. In 2005, 12 years after the initial regulations, the department issued interim guidance that elaborated further on the original regulations. This guidance expanded the need for documentation on fiscal constraint compliance, including discussion of what constituted reasonable revenues to consider in MPO plans, TIPs, and STIPs. Following the passage of the Safe, Accountable, Flexible, Efficient, Transportation Equality Act: A Legacy for Users (SAFETEA-LU) in 2005, USDOT initiated a major new rule making that culminated in publication of the Final Rule in the Federal Register in February 2007. In addition to its focus on fiscal constraint, the Final Rule added a new requirement that "revenue and cost estimates for the TIP must use an

inflation rate(s) to reflect 'year of expenditure dollars,' based on reasonable financial principles and information developed cooperatively by the MPO, State(s) and public transportation operator(s)."[1]

Throughout this period, states and MPOs frequently expressed support for the objectives that USDOT and Congress sought to achieve, while disagreeing vigorously with the increasing requirements ultimately embodied in the Final Rule. Many states believed that the regulations went unnecessarily beyond what the statute required. While the department did make some changes to these final regulations, at the suggestion of state comments, it by and large retained the substance of the draft rule.

In 2000–2001, following passage of the Transportation Equity Act for the 21st Century (TEA-21, 1998) and well before the Final Rule, FHWA and FTA conducted their own review of the impact of the fiscal constraint on the STIP development process. Subsequently, in 2002–2003, FHWA carried out a domestic scan to gain insight on financial planning and fiscal constraint in the statewide planning efforts across the country. [2] The scan was carried out in two parts. Part one was a TRB Peer Exchange on statewide multimodal transportation planning, held in Woods Hole, Massachusetts, in July 2002 [3] This exchange included 11 states: Alaska, California, Florida, Maryland, Massachusetts, Michigan, Minnesota, Ohio, Texas, Washington, and Wisconsin. Part two was a scan conducted by USDOT, which selected state experts on financial planning. The states visited included Arizona, Oregon, and Pennsylvania. This review's findings focused on the importance of applying realistic fiscal constraint to plans and programs while allowing states flexibility in how to achieve the objective.

Throughout this period, individual states and MPOs continued to struggle with the expanding federal requirements. During the rule-making process after 2005, many expressed concerns about what they considered excessive requirements. In the spring of 2006, in response to these concerns, FHWA and FTA initiated a study of how states and MPOs have responded to fiscal constraint. FHWA contracted with AASHTO on a study and subsequent white paper to assess best practices in several states and their corresponding FHWA Division Offices and to "make recommendations with respect to steps that could be taken to help states more effectively achieve the policy objectives of ISTEA with respect to this issue." [4]

This white paper confirmed that there existed "strong support across the board for the policy objectives of accountability, realism, and transparency in the planning and programming process…." However, it also noted strong disagreement by some states on the details of FHWA/FTA enforcement of the planning requirements. The states involved requested more formal opportunities for them to share with each other and the FHWA and FTA their planning, program

[1] "*Federal Register*, Vol. 72, No. 30, 450.324 (h) p. 7278, February 14, 2007

[2] "Domestic Scan Tour: Financial Planning & Fiscal Constraint," FHWA, 2004

[3] "Addressing Fiscal Constraint and Congestion Issues in State Transportation Planning," *Transportation Research Circular*, Number E-CO62, Woods Hole, Massachusetts, July 14-16, 2002

[4] "White Paper: Fiscal Constraint—or Fiscal Constraint? Issues of Compliance with Federal Requirements for STIPs, TIPs, and Long Range Plans," Prepared by Donald H. Camph, Aldaron, Inc. Los Angeles, CA for the AASHTO Standing Committee on Planning, November, 2008

management, and other business practices that helped in fiscal constraint compliance.

The scan team's findings on states and MPO reactions to current law and regulation covering fiscal constraint and YOE are largely consistent with these earlier efforts to assess the federal approach. Every DOT and MPO that the team visited endorses the reasonableness of requiring the development of fiscally constrained plans and programs. Most, but not all, of the states and MPOs believed that they were complying appropriately with the regulations and that the burden was not too great. Their views differed, in part, based upon the flexibility afforded by the respective federal agencies.

It is also clear to the scan team that all of the visited sites are making serious efforts to comply with federal requirements. A number of DOTs have been proactive in providing guidance to MPOs and the public regarding the most effective ways to comply. States and MPOs generally address the importance of fiscal constraint within their plans, TIPs, and STIPs. New York, for example, has issued a policy document that explains to MPOs and the public the precise requirements governing fiscal constraint and that provides a link to NYSDOT's methodology for calculating YOE.[5] California, in cooperation with FHWA and FTA, issued similar guidance in 2004, well before USDOT issued the Final Rule in 2007.[6]

MPOs across the country have examined fiscal constraint and YOE requirements as well. In December 2007, HGAC hosted an MPO peer workshop on Addressing Financial Uncertainty and Year of Expenditure Requirements, which resulted in a report prepared for FHWA in January 2008.[8] This same subject was also addressed at AMPO's national meeting in October 2008.

Nearly all express concern over the trend in recent years of turning long-range plans and programs into accounting documents rather than what they were primarily intended for, namely planning and programming. Some argue that metropolitan plans, especially, should provide a vision for the future; this vision might be compromised by too sharp a focus on fiscal constraint. A few mentioned that MPO staffs were becoming more administrative in nature and that their important planning capability was suffering because of the focus on financial planning and management. For the TIPs and STIPs, a few states were concerned by the requirement to demonstrate fiscal constraint annually, and they believe that constraint over the lifetime of these programs is more appropriate.

While the states and MPOs generally conclude that recent guidance on the application of YOE to project costs has helped to clarify options for compliance, there was virtually unanimous agreement that the use of YOE in metropolitan plans, especially beyond the first 10 years, substantially exceeds their ability to forecast future project cost inflation and revenue. They would like relief from this requirement, in part, they maintain, because these plans are updated regularly enough to adjust longer range forecasts.

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[5] "TIP/STIP Guidance," NYSDOT, Policy & Planning Division, Statewide Planning Bureau, October, 2008

[6] "A Guide to Federal and State Financial Planning Requirements," FHWA, FTA, CALTRANS, April 28, 2004

[7] "Summary Report: MPO Peer Workshop on Addressing Financial Uncertainty & Year of Expenditure Requirements, hosted by Houston-Galveston Area Council, Houston, Texas, December 13–14, 2007," prepared for Federal Highway Administration, January, 2008

In addition, while most concede that the risks of inadequate revenue growth and cost inflation should be recognized in the near-term TIPs and STIPs, some argue that individual project cost estimates in the later years of these programs often include projected inflationary impacts. Therefore, they conclude that further application of across-the-board inflation is duplicative. Others argue that the expression of project costs in constant dollars remains a reasonable methodology for achieving transparency while still allowing for acknowledgment of inflationary threats. They contend that the public more easily understands costs expressed in constant dollars rather than costs reflecting years of forecasted compounding inflation rates, especially in long-range plans, where compounding impacts are most acute. All states and MPOs agree that the federal aid system should be adequately operated and maintained, but are concerned that existing revenue levels may not be sufficient. They are also concerned with the vagueness of these objectives and, therefore, their ability to demonstrate reasonable compliance.

All states and MPOs are struggling with uncertainty regarding current and future federal funding levels. This uncertainty compounds the difficulty of determining fiscal constraint. In addition, all states are experiencing sharp declines in state and local revenues that support transportation. As a result, some previously approved TIPs and STIPs have become fiscally unbalanced, which will adversely impact the delivery of committed programs. The objective of fiscal constraint has become a moving target, as illustrated in Figure 1.1.

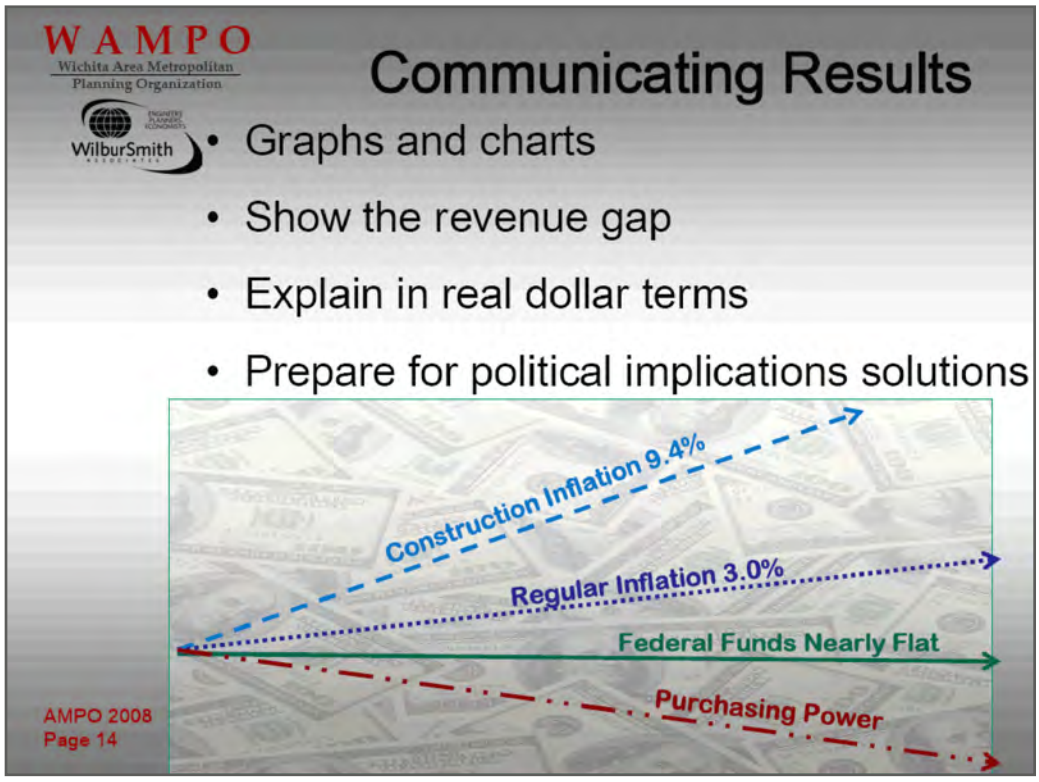


Figure 1.1 *From WAMPO presentation "YOEs and You, One MPO's Journey," presented to AMPO, 2008*

While states have most recently experienced a moderating trend in the inflation rates for critical materials used in construction, the ongoing volatility of these prices makes any effort to project future inflation rates difficult, particularly for long-range plans.

Factors Impacting State and MPO Approaches to Compliance with Fiscal Constraint and YOE

Best practices for the purposes of this scan are defined as approaches and/or tools that:

- Assist a particular state or MPO to successfully comply with fiscal constraint and YOE requirements
- Represent good management strategies for meeting the broader objectives of plans and programs, while effectively complying with federal fiscal requirements

The scan's identification of any individual best practice is not intended to imply that it is always the preferred means for achieving compliance. Therefore, it is important to emphasize the following factors, which often determine a given state's or MPO's approach to ensuring fiscal constraint. The success of certain approaches or best practices often hinges on the following:

- The sheer dollar size of the state's or MPO's program and the number of transportation operators (i.e., its complexity) impact both the development and implementation of plans and programs. The volatility in costs and schedules, which adds to the need for amendments, appears to be somewhat related to size and complexity.
- The working relationship and degree of trust between a state and its MPOs are important factors in effective fiscal management. The quality of communication between the state and its MPOs and the consistency of information sharing also helps to determine the ease with which they are able to comply with federal requirements.
- The working relationships of both the states and MPOs with their FHWA divisions and FTA regions are also critical in facilitating compliance. Those states and MPOs that have worked with their respective federal partners to effectively utilize the available flexibility provided by the planning regulations are clearly better positioned to meet fiscal constraint requirements.
- Cooperation between the two respective federal agencies is also important to effective planning and programming in a given state or MPO.
- Individual state funding mechanisms for transportation and the role of the legislature, governor, and, in some cases, a transportation commission, may encourage certain practices for managing fiscal constraint that are not appropriate for another state.
- The degree to which state law imposes additional requirements for achieving fiscal constraint may also help to determine which practices are most effective for that state. Specific state legislative requirements may require steps that are not useful and may possibly be prohibited in other states.

- The relative importance of federal highway and transit funding to state and local funding, including tolls, is another factor that needs to be considered. For many states, the federal share of their highway and transit programs is declining as a percentage of their total program.

Because these factors affect states and MPOs differently, the scan team concludes that one size does not fit all when it comes to best practices.

The Role of Organizational Structure and State Context

DOT organizations, particularly their placement of planning and program management, are strikingly similar. The role of the CFO does vary in terms of responsibility for managing the program, especially the STIP, but no matter this office's placement, it plays a critical role in the areas that impact fiscal constraint. Clearly, a strong working relationship and good communications between planning, programming, finance, and cost estimating are crucial to effective compliance with fiscal constraint. A few states have created a discrete local programs management office, which appears to play a positive role in promoting local project delivery. The organizational charts from three DOTs provide examples of overall organization for WSDOT (Figure 1.2) and MoDOT (Figure 1.3), as well as the Policy and Planning organization within NYSDOT (Figure 1.4). Note the separate local program offices in WSDOT under the Chief of Staff and a similar office in NYSDOT under the Office of Regional Planning and Program Coordination.

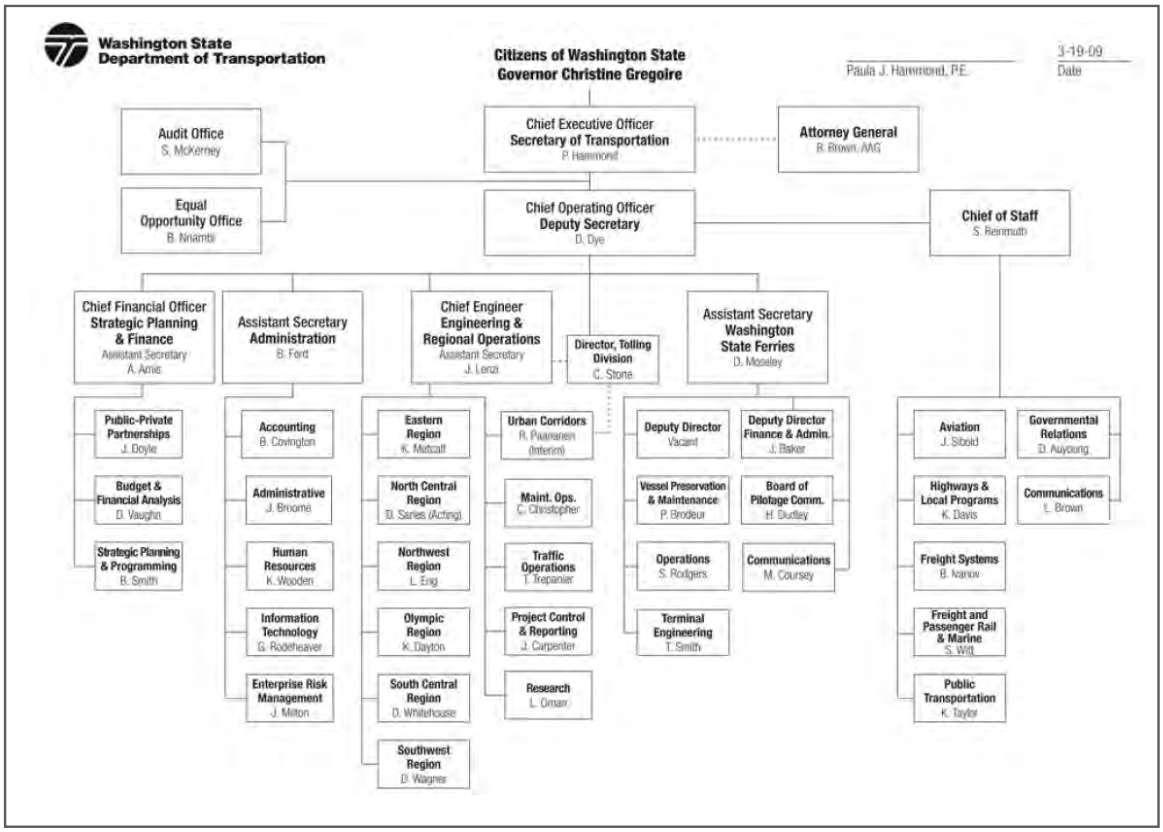


Figure 1.2 *WSDOT organization chart*

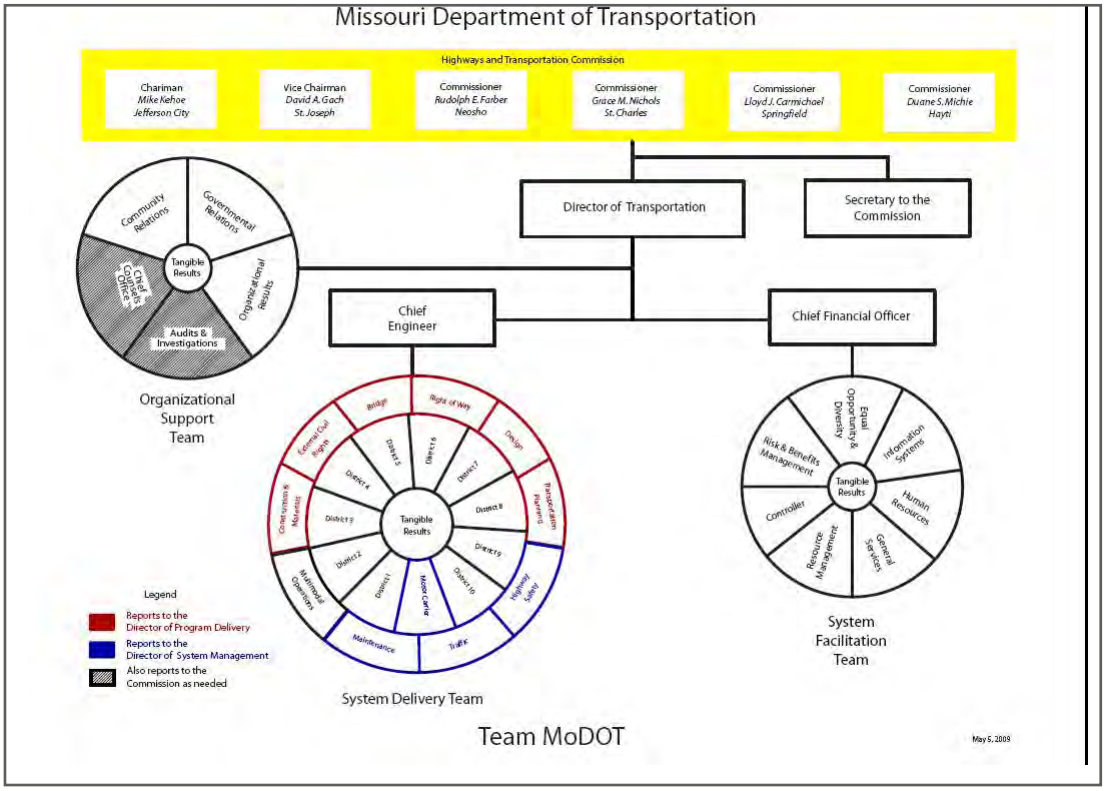


Figure 1.3 *MoDOT organization chart*

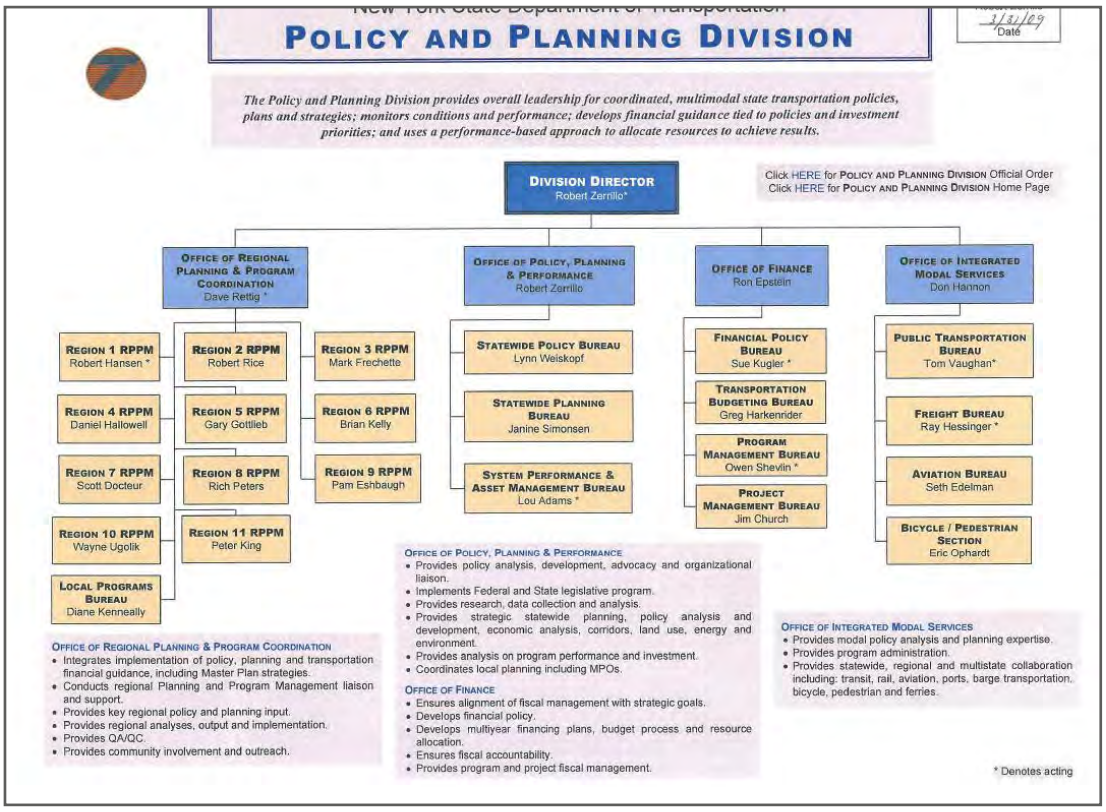


Figure 1.4 *NYSDOT Policy and Planning Division organization chart*

The larger context in which DOTs and MPOs operate in their respective states varies significantly and plays some role in their approach to fiscal management. For example, some state legislatures play a major role in approving transportation programs and overseeing any major changes. In others, a transportation commission can make program decisions with little if any role for the legislature or governor. Still other DOTs report directly to the governor. Colorado has its own state law requiring fiscal constraint, which lends even greater importance to CDOT's clear emphasis on financial management of its transportation programs.

The MPOs that the scan team visited also reflect differing approaches to membership, voting procedures, and organizational structure. For example, while MPO voting membership generally includes local elected officials, transit operators, and state DOTS, Texas also includes legislative representation and CDOT sits on only one of its five MPO policy boards. Some use weighted voting while others, such as New York, rely upon consensus voting. The exact role of policy boards and planning or technical committees differs between MPOs, but without significant impact on fiscal constraint. All articulate the importance of close working relationships between MPOs and the state DOTs as being essential to sound transportation planning and financial management.

The organizational factor that may have the greatest impact on fiscal constraint compliance is whether a particular state's DOT uses a centralized or decentralized approach to planning, program development, and program and project management. While regional offices or districts exist in almost all states (Vermont is an exception), the degree of autonomy that these districts have differs substantially. NYSDOT's central office, for example, clearly provides policy guidance and oversight on program development and management. The 11 individual regions, however, have the lead on working with MPOs on metropolitan plans and in developing their individual programs that are ultimately included in TIPs and the STIP. The regions, in cooperation with their MPOs (some regions contain more than one MPO), are responsible for implementing their own programs, including the management of financial allocations that have been provided by the central office. The regions have a great deal of day-to-day autonomy in managing fiscal constraint. While this approach works well for NYSDOT, it does complicate the effort to maintain fiscal balance in the STIP during its implementation.

At the other end of the spectrum, Vermont, due in part to its small geographic size, develops its program centrally and leaves only the maintenance portion of its overall program budget to its Regional Planning Committees (RPCs). Funding is not allocated to these committees; instead, it is allocated to certain priority program categories. Federal funds are used only on state-owned facilities that are managed by VTrans centrally. This approach undoubtedly facilitates the management of fiscal constraint during both program development and implementation.

Figure 1.5 is VTrans's organization chart, which shows its centralized approach.

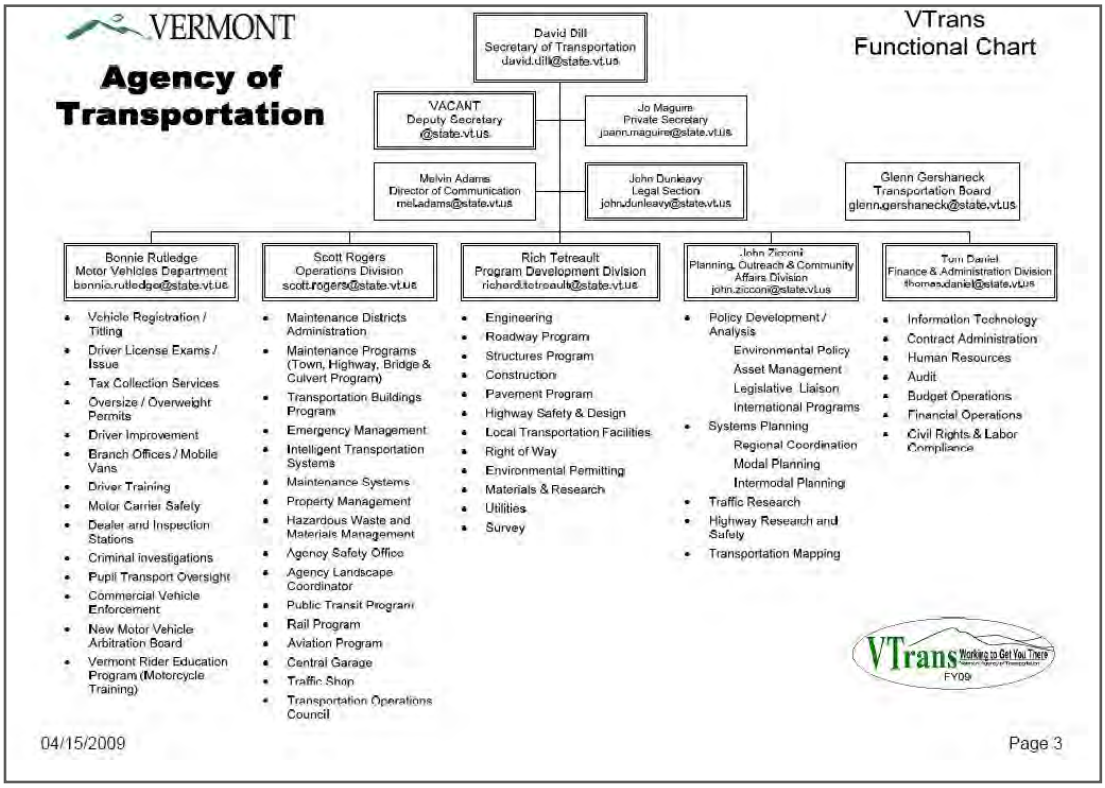


Figure 1.5 *VTrans organization chart*

The other states fall somewhere between the centralized and decentralized approaches. The scan team concludes that organizational approach is not a determining factor in how well a particular state complies with the federal requirement; however, decentralization, as in New York, does heighten the challenge.

CHAPTER 2

Approaches to Revenue Forecasting and Cost Estimation

The revenue element of MPO plans, TIPs, and STIPs is a foundational part of these documents. While the states visited by the scan team utilize a variety of revenue forecasting approaches, all agree that forecasting is more art than science. Revenue forecasting has proven particularly challenging recently, given the great uncertainty over future levels of federal funding for the core highway and public transit programs. Questions about the future of the highway trust fund make it difficult to develop reasonable forecasts.

Recent sharp declines in state and local revenues have only exacerbated this difficult situation. All states are now forecasting transportation needs well in excess of revenues from all sources to meet these needs. The growth limitations inherent in motor fuel taxes, which most states rely upon, compounded by the current national economic recession only add to the uncertainty surrounding transportation revenue forecasting. Both of these factors are contributing to financial instability in long-range plans and are almost certainly inhibiting the visionary planning that many feel is essential. Universally, the severe revenue shortfalls are forcing states to increase their focus on infrastructure maintenance and rehabilitation and to commit less to perceived needs for facility and service expansion. All would argue that current revenues are not adequate even to meet their real infrastructures needs. Revenue shortfalls are especially impacting TIPs and STIPs, which recently have become fiscally imbalanced almost immediately upon approval. While all concur that fiscal constraint is an important objective, the current situation has made compliance more challenging.

It is difficult to identify best practices in revenue forecasting because each state's structure for managing its budget differs and is largely determined by state law. Nevertheless, the team identified several approaches that appear to be effective in addressing the revenue question.

Centralized Revenue Forecasting

Several states have centralized revenue forecasting organizations that provide direction for the entire state. New York, by statute, has the Division of the Budget (DOB), which reports directly to the governor, giving the governor decisive overall authority for revenue management as well as for the expenditure side of the state's budget. DOB is responsible for forecasting future state revenues dedicated to both highways and mass transit and works closely with NYSDOT on federal funds forecasting. NYSDOT has its own forecasting capability for both state and federal transportation funds, which helps to ensure that DOB's estimates

are made with department input. VTrans also relies upon both the state legislature and a separate state agency for all revenue forecasts.

KDOT has representation on the state's central Highway Revenue Estimating Group (HREG), which provides a single point in the state for revenue forecasting while helping ensure that transportation expertise is represented. Similarly, WSDOT also has a seat on the state's Revenue Council, a discrete state agency with the broadest outlook on revenue. These central approaches, while by no means providing full autonomy to the DOTs on revenue forecasting, do ensure a more uniform and consistent estimate that can guide both the DOTs and the affected MPOs in those states.

The Missouri Highways and Transportation Commission ultimately controls MoDOT's revenue forecasting. Missouri is the one state the scan team visited that hires a professionally trained staff economist to play a leading role in the department's revenue forecasting. It also conducts regular reviews to measure forecasts against actual revenue figures so that it can adjust its forecasts.

Another model that the scan team identified is exemplified by CDOT, which sits on a central committee that also includes the state's Transportation Commission and the MPOs. Both CDOT and the MPOs are then required to rely upon these forecasts in their plans and programs. Further, while TxDOT has developed transportation revenue forecasts for the state, historically the department has allowed the MPOs flexibility in deriving their own estimates. The inconsistencies that this might produce has led the department to undertake a statewide initiative with the MPOs to move to a uniform revenue forecasting model similar to the ones used in the states discussed above.

Other Revenue Forecasting Models

MPO long-range plans present the biggest challenge for revenue forecasting largely because these plans cover a period sometimes in excess of 20 years. Clearly, the greatest uncertainty about available revenue is over the long term. It is more difficult to assess what comprises reasonable revenue numbers when it is unknown how or if the state governments and Congress will meet transportation's need for additional revenues in the future. Assuming current levels in these plans, a conservative approach to be sure, leaves little room for providing a vision or meeting system needs for the long term.

Both CDTC and PSRC provide a constructive model for how to meet this challenge. In developing their plans, they work closely and proactively with their respective DOTs to develop forecasts that serve the plan's overriding purpose. CDTC, with NYSDOT's participation, develops revenue forecasts that it believes are essential to meeting the region's future transportation needs. The MPO does not identify where additional funds will come from, but assumes that the state's policy makers will find sources in the future to meet these critical needs. PSRC, while also working with WSDOT, has developed its own revenue models to address the specific realities facing its region. This approach provides somewhat more

flexibility than a single statewide model to address these unique realities.

While the variety of approaches to revenue forecasting is determined by factors other than the federal fiscal constraint requirements, effective compliance with these requirements calls for an approach that is uniform across the transportation sector while allowing appropriate flexibility to account for local circumstances. Transportation-related revenue estimates are made credible when supported by a statewide central approach to forecasting. In the end, it is best if each state determines a best practice in this area.

Cost Estimating

Each state the scan team visited acknowledges that problems with project cost estimation create a major challenge for fiscal constraint compliance and sound program management. Despite many years of experience with cost estimating, unanticipated cost increases continue to drive the need for TIP and STIP amendments and, in many cases, the identification of project offsets. Recent high inflation rates for construction materials such as concrete, steel, and asphalt have contributed to bid prices being substantially higher than final estimates, even those that include some amount for contingencies. Locally managed projects present a special problem for DOTs and MPOs for a variety of reasons, including insufficient expertise in cost estimation.

DOTs have generally placed organizational responsibility for cost estimation during design under their Chief Engineer. Some continue to experience problems related to the hand-off between the project planning and scoping and the later design phases. All of the DOTs visited have established databases regarding recent experience with unit costs and a variety of pavement types and bridge treatments. Nevertheless, with the notable exception of MoDOT (discussed in detail below) and KDOT, most DOTs expressed ongoing concern over their ability to adequately control unanticipated project cost increases during the design phase, as well as at contract letting and award.

Efforts to ensure that cost estimates are as accurate as possible and are appropriately managed throughout a project's life are ongoing in all of the states that were visited. Clearly, the application of various project management strategies in many DOTs represents, perhaps, the single most important approach to improve the integrity of cost estimates. Domestic Scan 07-01, *Best Practices in Project Management Delivery*, provides a more detailed discussion of the approaches that states utilize, and the report clearly emphasizes the importance of sound project management in delivering committed transportation projects included in MPO plans, TIPs, and STIPs.

Of the states the scan team visited, Missouri, for one, demonstrates a best practice in its comprehensive commitment to project management. With strong leadership from executive management, MoDOT systematically tries to control project costs and scopes, two closely related elements. Its program budget and schedule are reviewed routinely at the highest levels, and designers must communicate any proposed changes to scope, cost, or schedule to the Chief Engineer. MoDOT maintains a strong commitment to the principle of original project

purpose and need. The department has also utilized value engineering extensively and made an overall commitment not to "gold plate" project designs, something that it admits required a culture change. As a result, MoDOT processes a very low number of amendments, especially those substantial ones that must go to the state's transportation commission for approval.

MoDOT has also utilized innovative contracting to encourage additional cost savings during the project construction phase. For example, contractors will be paid 25 percent of any additional savings that they can identify in the final design estimate. Such partnering with contractors is an important element of the department's efforts to manage project costs.

Those DOTs that have placed strong emphasis on sound project scoping (e.g., WSDOT) appear to experience less volatility in their project costs. By involving each of the key functional areas in the scoping process, WSDOT experiences fewer scope changes that adversely impact project costs.

WSDOT also uses its Tracker Report to routinely monitor the performance of its individual districts on delivery of their programs within the budgeted allocation. In the case of locally sponsored projects, MoDOT requires an early commitment of funding from the locality before placing a project on the state's program.

KDOT utilizes its Program Review Committee to examine significant project cost estimate increases under the leadership of the department's Chief Engineer. The department maintains that this process helps to ensure careful cost estimates with fewer changes during design.

For CDOT, initial planning level cost estimates are done in the regional offices; however, once a clear project is identified, it is placed under a resident engineer for the life of the project, including during the construction phase. Contingency levels are assessed at different stages of a project's design. The department also maintains an extensive database of bid histories that is maintained on its Web site for local agencies to use for their own projects. A local agency project manager housed in the regional offices manages both design and construction for local projects.

NYSDOT, which has faced substantial volatility in bid prices in recent years, has undertaken an ongoing review of its cost estimating procedures under the direction of the Chief Engineer. The department is now integrating routine use of risk management techniques, has recently purchased a more up-to-date project management software system for use throughout the agency, and is relying more on use of performance measurements to assess how well cost estimates are being controlled.

The scan team concludes that there is no silver bullet for improving the reliability of cost estimates. Rather, a combination of management and technical tools seems essential to controlling costs throughout a project's life. A major commitment to systematic project management, including regular participation by executive management, appears to be the most effective means for accomplishing this end.

CHAPTER 3

Approaches to MPO Plan, TIP, and STIP Development

It should be noted that MPO and DOT compliance efforts comprise only one element among many that contribute to the development of successful MPO long-range plans, TIPs, and ultimately the STIPs. The scan team is well aware that the DOTs and MPOs that it visited utilize widely varying time periods, update cycles, and approaches to developing these plans and programs. Across the board, however, MPOs and DOTs recognize the importance of public involvement and transparency in the development of these documents. The fiscal constraint and YOE requirements have certainly enhanced the importance of transparency and accountability to the public, particularly on the financial side. The team notes that all of the states and MPOs visited are making a serious effort to comply with financial constraint during the development stage of their plans and programs.

Best Practices in Metropolitan Plan Development

The fiscal constraint and YOE requirements, as they relate to MPO long-range plans, are designed to promote realistic planning within resources that can reasonably be expected to be available during the plan's life. MPOs have struggled with this requirement, in large part, because of the paramount difficulty in forecasting what Congress and their state legislatures will provide over an extended period. Recent declines in traditional revenue sources at both the state and federal levels and such congressional actions as fund rescissions have exacerbated the challenges facing the MPOs.

In general, MPOs and DOTs have been conservative in their revenue estimates, an approach that, for some, is overly constraining when it comes to developing long-range plans that they believe should provide a vision beyond current financial realities. As discussed in Chapter 1.0, all of the sites visited struggle with the application of YOE to long-range plans, especially beyond year 10. The compounding impact of estimated inflation rates becomes staggering when applied over whatever period of time a particular MPO uses. Nevertheless, with only one exception, the MPOs that the scan team visited have long-range plans that are fiscally constrained and YOE compliant.

Certain MPOs (CCMPO in Vermont is a good example) are conservative and simply straight-line revenue forecasts for their plans based upon historical data on revenue and, in turn, apply a uniform compounding inflation rate to each year of the plan. While this approach is fully compliant, some view this approach as undermining the overriding visionary purpose of long-range plans.

One of the fundamental best practices identified is a proactive role by the state and its DOT to provide policy, financial, and corridor and/or major project guidance to all of its MPOs before they

prepare new plans. For example, the Colorado Transportation Commission, working closely with CDOT, provides such guidance, focusing on major corridors requiring inclusion in particular MPO plans. The Commission also provides this guidance to the 10 rural planning districts throughout the state. In addition, as briefly mentioned in Chapter 1.0, NYSDOT has issued overall guidance to its MPOs on how to manage fiscal constraint and YOE. This practice of issuing guidance statewide provides a uniform base from which MPO plans and, later, their TIPs should be developed.

Clearly, the role of MPO staff in working with their various transportation operators is critical to fiscal constraint in the ultimate plan. A number of techniques appear to work effectively. PSRC, after first working with WSDOT to establish its revenue forecast, then works closely with each of its operators to develop project costs for the plan that are reasonable and consistent with other estimates. This MPO relies heavily upon cost/benefit analysis applied to the system to identify cost-effective investments over the plan's life.

Some MPOs, with TRPC in Washington providing a good example, include only regionally significant projects and programs in their plans, while still broadly accounting for all costs when determining fiscal constraint. Again, estimates for these projects are developed cooperatively between the appropriate operator and the MPO staff. WAMPO in Kansas approaches the plan by providing its operators with project selection criteria to better enable them to identify high-priority and cost-effective projects for listing in its plan.

Many MPOs are availing themselves of the allowed flexibility to show project costs beyond 10 years of their plan in cost ranges or bands. This flexibility addresses, in part, the general concern about the accuracy of cost estimates and inflation in the period beyond year 10 in plans, and better enables the MPOs to stay within their revenue estimates.

One of the most striking best practices is demonstrated by CDTC in New York, which, due to high inflation rates in recent years and severe revenue constraints, has adopted a unique practice in its most recent long-range plan. In cooperation with NYSDOT and its other operators, the MPO has identified a "minimally acceptable plan for infrastructure rehabilitation" and severely limited future investments in system expansions or improvements. The plan complies with fiscal constraint requirements by assuming, without identifying clear revenue sources, that the plan is constrained, "but only if public funding increases regularly over the next 25 years as it has in the past." The MPO maintains that it would be contrary to the visioning purpose of an MPO plan to be more conservative on revenue assumptions. It also argues that the adverse impacts on transportation infrastructure conditions would be so severe under a more conservative approach that it would be unacceptable to transportation policy makers at the state and federal level. Under the flexibility provided by the Final Rule, CDTC's respective federal agencies have accepted this approach as a reasonable practice for fiscal constraint compliance.

Best Practices for TIP Development

The scan team concludes that the fiscal constraint requirement has largely eliminated the over-programming of TIPs so common prior to ISTEA. It should be emphasized, however, that recent

steep drops in transportation revenues have made the challenge in developing fiscally constrained but programmatically responsive TIPs much greater. These declines have resulted in delaying many projects from when they were originally scheduled in the last approved TIPs. Despite these challenges and the need for adjustments, the scan team was able to identify a number of best practices being followed by MPOs in the development of their recent TIPs.

It should be noted that, with the exception of New York State, the other MPOs and state DOTs have split the responsibility for TIP programming between the MPO and the DOT based upon federal funding category. For example, generally, MPOs have the lead in programming CMAQ and the Surface Transportation–Urban (STP–U) Program only, while the DOT assumes responsibility for programming the other federal fund categories. The DOTs' projects, funded with these other categories, are then simply added to a new TIP. New York, on the other hand, relies upon the MPO consensus decision-making procedure to determine project priorities for virtually all federal fund categories. The various member operating agencies, including the DOT, must compete to have their projects placed on an approved TIP. Virtually all states and MPOs use program goal-based criteria to select projects in various categories.

Virtually every state and MPO visited is now using estimated OA limits in its assumptions regarding available federal funds during the TIP's life. Even a state such as New York, which has historically programmed TIPs at the federally authorized levels, is now using OA as the basis for TIP development. The recent congressional trend toward frequent rescissions in specific federal fund categories has also encouraged the move to OA.

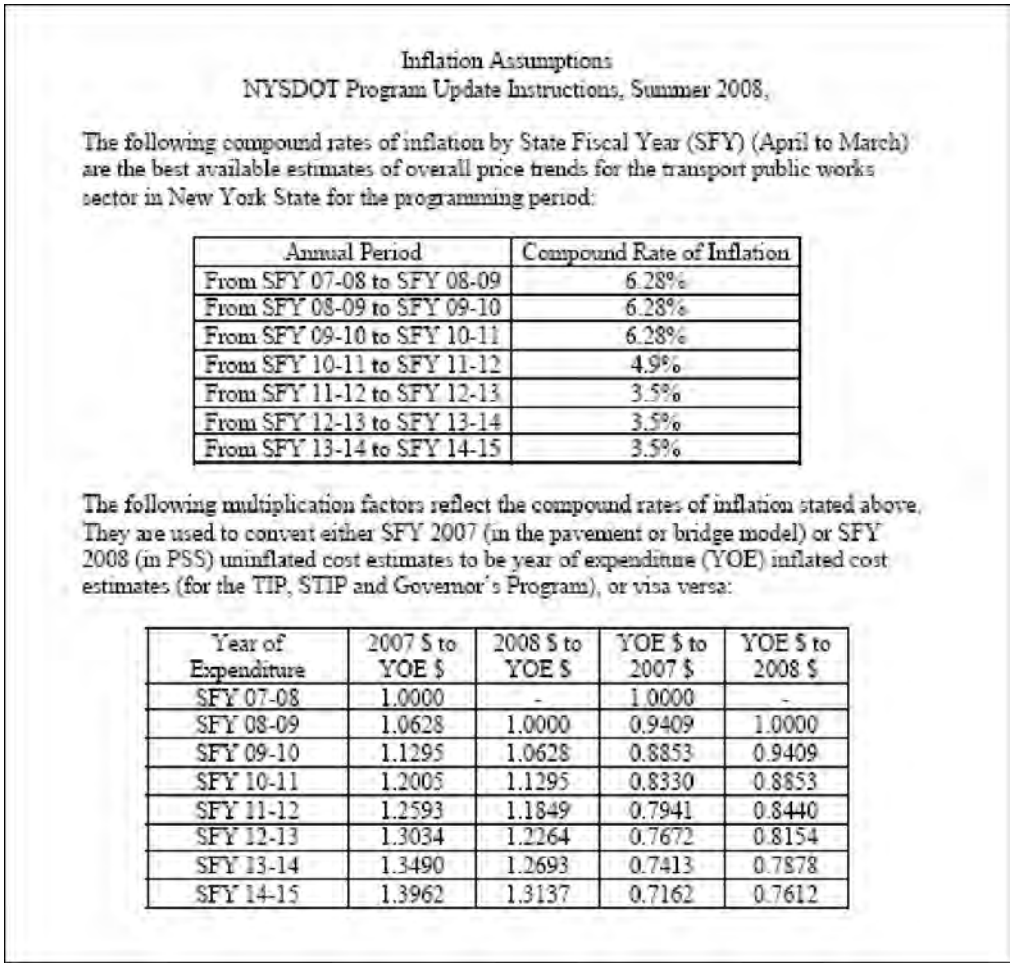
One of the most important best practices identified is the close coordination in some states between development of individual MPO TIPs with a comprehensive state effort to update an existing program or develop a new one. States approach this coordination differently, as explained below, but the coordination of the state program with TIPs ensures that all are on the same wavelength on revenue and cost assumptions, hence improving the likelihood of fiscal constraint compliance.

NYSDOT is a good example of a state that biennially develops a new rolling five-year transportation program tied closely to TIP updates that are on the same cycle. MPOs carry out their updates with the same federal revenue assumptions that the DOT uses. KDOT's comprehensive and fiscally constrained statewide program is established by state legislative action only (the Comprehensive Transportation Program [CTP]). This program defines what projects can be advanced during the program, while MPOs are still able to add federal aid projects to their individual TIPs using those federal funds under their purview.

Several MPOs are applying other best practices in the development of their TIPs. Many, including CAMPO, CCMPO, and CDTC are only placing projects on the TIP that have a high probability, based upon careful review, of being ready to go with the phase of work identified. This practice lends credibility to the TIP and lessens the likelihood that the TIP will become a wish list of projects that are unaffordable and unlikely to be able to advance as promised. TRPC in Washington provides a TIP mechanism for showing projects that are important but unaffordable

within fiscal constraint limits. These projects are included in an appendix and progress through the full public involvement process so that they can be advanced if additional funding should become available.

Most of the MPOs rely upon their DOT to establish inflation rates for the TIP to use for YOE compliance. By using these required rates, the MPOs ensure compliance. On the other hand, PSRC in Washington retains some flexibility for itself in calculating inflation rates that may be more appropriate than a statewide figure for its region. In addition, PSRC does not apply an inflation rate to projects whose cost estimates already consider future inflation. New York is an example of one state that establishes inflation rates to be used statewide; Figure 3.1 is a chart NYSDOT provides its MPOs.



Inflation Assumptions
NYSDOT Program Update Instructions, Summer 2008,

The following compound rates of inflation by State Fiscal Year (SFY) (April to March) are the best available estimates of overall price trends for the transport public works sector in New York State for the programming period:

Annual Period	Compound Rate of Inflation
From SFY 07-08 to SFY 08-09	6.28%
From SFY 08-09 to SFY 09-10	6.28%
From SFY 09-10 to SFY 10-11	6.28%
From SFY 10-11 to SFY 11-12	4.9%
From SFY 11-12 to SFY 12-13	3.5%
From SFY 12-13 to SFY 13-14	3.5%
From SFY 13-14 to SFY 14-15	3.5%

The following multiplication factors reflect the compound rates of inflation stated above. They are used to convert either SFY 2007 (in the pavement or bridge model) or SFY 2008 (in PSS) uninflated cost estimates to be year of expenditure (YOE) inflated cost estimates (for the TIP, STIP and Governor's Program), or visa versa:

Year of Expenditure	2007 $ to YOE $	2008 $ to YOE $	YOE $ to 2007 $	YOE $ to 2008 $
SFY 07-08	1.0000	-	1.0000	-
SFY 08-09	1.0628	1.0000	0.9409	1.0000
SFY 09-10	1.1295	1.0628	0.8853	0.9409
SFY 10-11	1.2005	1.1295	0.8330	0.8853
SFY 11-12	1.2593	1.1849	0.7941	0.8440
SFY 12-13	1.3034	1.2264	0.7672	0.8154
SFY 13-14	1.3490	1.2693	0.7413	0.7878
SFY 14-15	1.3962	1.3137	0.7162	0.7612

Figure 3.1 *Inflation assumptions from NYSDOT TIP/STIP guidance*

Best Practices in STIP Development

The STIP continues to be the primary authorizing document for all federally funded transportation projects. Many states are using the STIP to show all projects, regardless of fund source; however, some states, like New York, show nonfederally aided projects for information purposes only.

Based upon the scan team's review of the seven states that it visited, there is clearly no consensus

on the role that the STIP should play in defining a state's transportation program. As is discussed below, a few states use the STIP as the single database and source for program budgeting, project selection, and subsequent program management. In other states, such as Kansas, the STIP is used primarily only to meet the federal requirement to have such a document. Some states, such as New York, have a separate program database that serves as the primary program management tool, while the STIP is used primarily to authorize federally aided projects. Because the DOTs develop and maintain the STIP, fiscal constraint at this stage is determined by the level of federal revenue assumed to be available over the life of the STIP. Maintaining fiscal constraint during the life of a STIP is a greater challenge than developing the initial constrained document, as will be discussed later in this report.

The following discussion, while not necessarily identifying best practices, highlights the variety of ways in which the STIP is developed and the role it plays in a particular state transportation program.

CDOT provides the single best example of a state that utilizes the STIP as its exclusive programming and budgeting document for transportation. CDOT not only has an automated connection between the statewide transportation plan and the STIP, ensuring consistency between the two documents, but it also has increasingly relied upon the STIP as its single source for programming since the passage of ISTEA. The state's conservative approach to revenue forecasting (i.e., it uses OA as basis for federal forecasts) and its allocation of funding for the STIP establishes fiscal constraint right up front in the development stage. CDOT's reliance on the STIP for comprehensive program management also facilitates its effort to maintain fiscal constraint during its life. Finally, CDOT's use of its SAP system is vitally important to maintaining fiscal constraint. This system allows the department to automate its policies and practices on fiscal constraint and to demonstrate its compliance to FHWA and FTA at any given time by running a report from this system.

MoDOT includes state-funded and federally funded projects in its STIP, allowing the department to use the STIP as the most important source for program development and management. At the other end of spectrum, KDOT's approved transportation program is established by the state legislature, as discussed above. The CTP, a 10-year program last approved in 1999, outlines specific projects to be advanced; in turn, the CTP is used to develop the STIP, which is then used only for federal project authorization. Unlike most other states, which add the TIPs as approved into the STIP, KDOT's STIP includes MPO TIPs by reference only. The TIPs are then submitted to the FHWA and FTA separately for approval. The STIP's financial plan simply reflects KDOT's separate financial plan tied closely to the CTP.

Both NYSDOT and WSDOT have moved to an electronic STIP (ESTIP), which not only improves transparency with the public, but also facilitates the management of fiscal constraint in both the development and management of the STIP. NYSDOT's ESTIP is now used statewide, and the department plans to eventually maintain a public Web site that will routinely reflect a current version of an amended STIP. WSDOT is upgrading its current ESTIP with a new system. All of the MPOs, except PSRC, can directly input to it.

CHAPTER 4

Approaches To MPO Plan, TIP, And STIP Management And Implementation

The scan team concludes that the implementation and management of approved plans, TIPs, and STIPs present the biggest challenge for DOTs and MPOs in fiscal constraint compliance. In contrast, while the YOE requirement does not appear to present a major challenge during the implementation stage thus far, some are concerned about the substantial variation between forecasted and actual inflation rates. One concern expressed is that if inflation is over-estimated, a program may include fewer projects that can ultimately be funded.

The scan team spent the greatest amount of time in its discussions with DOTs and MPOs on the implementation challenges. The team concludes that while almost all are successfully complying with fiscal constraint, the workload and the issues presented by current fiscal constraint requirements are still problematic.

MPO Plans

MPO long-range plans are updated regularly, although MPOs differ in their frequency. Project cost and revenue forecast changes can be readily incorporated into these updates. PSRC reflects a best practice in its approach to the long-range plan by performing annual updates of varying levels of comprehensiveness that capture fiscal changes. This MPO does not wait for a new plan to be developed to keep costs and revenues updated, which greatly facilitates fiscal constraint compliance. Also, the use of cost bands or ranges for projects beyond 10 years during a plan's development facilitates compliance during the implementation phase.

MoDOT, as do some other DOTs, develops a planning framework through its planning process. Details of this document are provided to the MPOs in the *Planning Framework Practitioner's Guide*. Relying upon this framework, both the statewide plan and the MPO plans are comprehensively updated every five years.

One of the major problems cited by several MPOs and DOTs is the impact of revenue and cost volatility on the viability of long-range plans. The difficulty of actually implementing these plans in the face of sharp revenue declines, in particular, has many questioning the value of what is an intensive plan development process committing limited resources to a plan that cannot be implemented without major changes.

TIPs and STIPs

The challenges facing MPOs during the implementation phase of TIPs are far greater than those

presented by long-range plans. Consequently, the best practices identified in this section may prove effective for other MPOs seeking to improve their approach to fiscal constraint compliance. All of the states and MPOs experience some degree of project cost and revenue volatility during the TIP implementation phase. The number of TIP amendments and administrative actions varies widely across the MPOs visited, depending largely on the size, complexity, and clean air attainment/nonattainment status of a particular MPO region. MPOs, therefore, rely upon different cycles for conducting formal TIP amendments, generally from daily to at least quarterly. The public review process required for amendments can often take up to several months before the federal agencies can officially approve an amendment. The Final Rule allows substantial flexibility in the way that MPOs define changes that require a formal amendment versus those that can be handled administratively and, therefore, more routinely.

One of the most important best practices that the scan team observed in all of its visits is a positive and close working relationship between the MPO and FHWA/FTA as well as between the state DOT and these same federal agencies. A strong working relationship appears to allow for maximizing the use of administrative processes for most changes that are considered routine and that will not substantively impact fiscal constraint. The scan team found that best practices were most successful when FHWA and FTA division offices actively support MPO and DOT efforts to maximize the use of allowable flexibility.

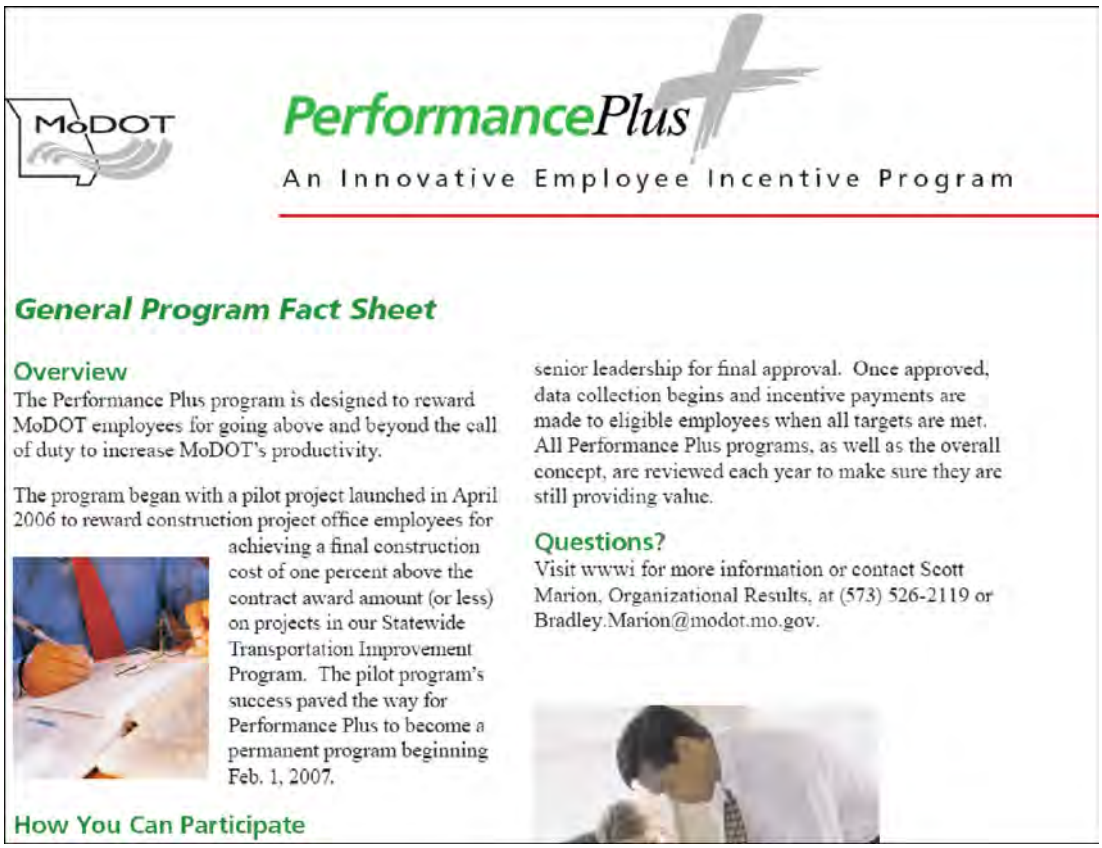
Since MPOs generally rely upon their member agencies to develop and manage projects that are included in a TIP, most of the fiscal and schedule volatility experienced by TIPs is the result of approaches taken by these member agencies. The scan focused on the state DOTs that it visited as providing the best example for best practices in this regard. One of the major challenges facing both TIPs and STIPs is cost and schedule volatility on locally sponsored and managed projects. DOTs and MPOs have responded to this challenge in two fundamental ways. WSDOT, NYSDOT, MARC, and WAMPO, for example, work closely with their local project sponsors on cost estimation to enhance quality control. Others, such as CDOT, cap local projects at the original amount of aid provided in the TIP and require that locals demonstrate that they have their share of funds fully available for the project. Under this latter approach, the local sponsor must assume all project cost increases if the project is to advance.

The scan team concludes that, by far, the most important approach to managing TIPs and STIPs within fiscal constraint requirements is to use a formal project management process, particularly by the DOTs.[8] While all of the DOTs maintain that project management is used, MoDOT, KDOT, and WSDOT stand out for their strong commitment to a formal project management system. MoDOT in particular has in place a highly effective project scope and cost control system that results in the need for very few TIP or STIP amendments during a typical year. Each year, Missouri's Transportation Commission must approve only a handful of STIP amendments. MoDOT also relies upon innovative contracting provisions and an incentive program for its own

[8] See Scan 07-01, *Best Practices in Project Delivery Management*, 2009, for a more comprehensive discussion of best practices in project management across the country.

employees to reduce project costs at time of construction. The department has put great emphasis on establishing a culture of project management that focuses on purpose and need in scoping and designing projects. Design engineers must present scope or cost increases to the Chief Engineer for his or her approval, a requirement that helps limit changes. Since MoDOT believes that the STIP cannot be both a planning document and an accounting document, it takes the long view in assessing delivery of the STIP. Over the period 2002–2008, for example, the department focused on a total program review and found the final project costs were within -0.40 percent of estimated costs.

Figure 4.1 is an excerpt from a document describing the purpose of MoDOT's employee incentive program.



MoDOT

PerformancePlus

An Innovative Employee Incentive Program

General Program Fact Sheet

Overview

The Performance Plus program is designed to reward MoDOT employees for going above and beyond the call of duty to increase MoDOT's productivity.

The program began with a pilot project launched in April 2006 to reward construction project office employees for achieving a final construction cost of one percent above the contract award amount (or less) on projects in our Statewide Transportation Improvement Program. The pilot program's success paved the way for Performance Plus to become a permanent program beginning Feb. 1, 2007.

How You Can Participate

senior leadership for final approval. Once approved, data collection begins and incentive payments are made to eligible employees when all targets are met. All Performance Plus programs, as well as the overall concept, are reviewed each year to make sure they are still providing value.

Questions?

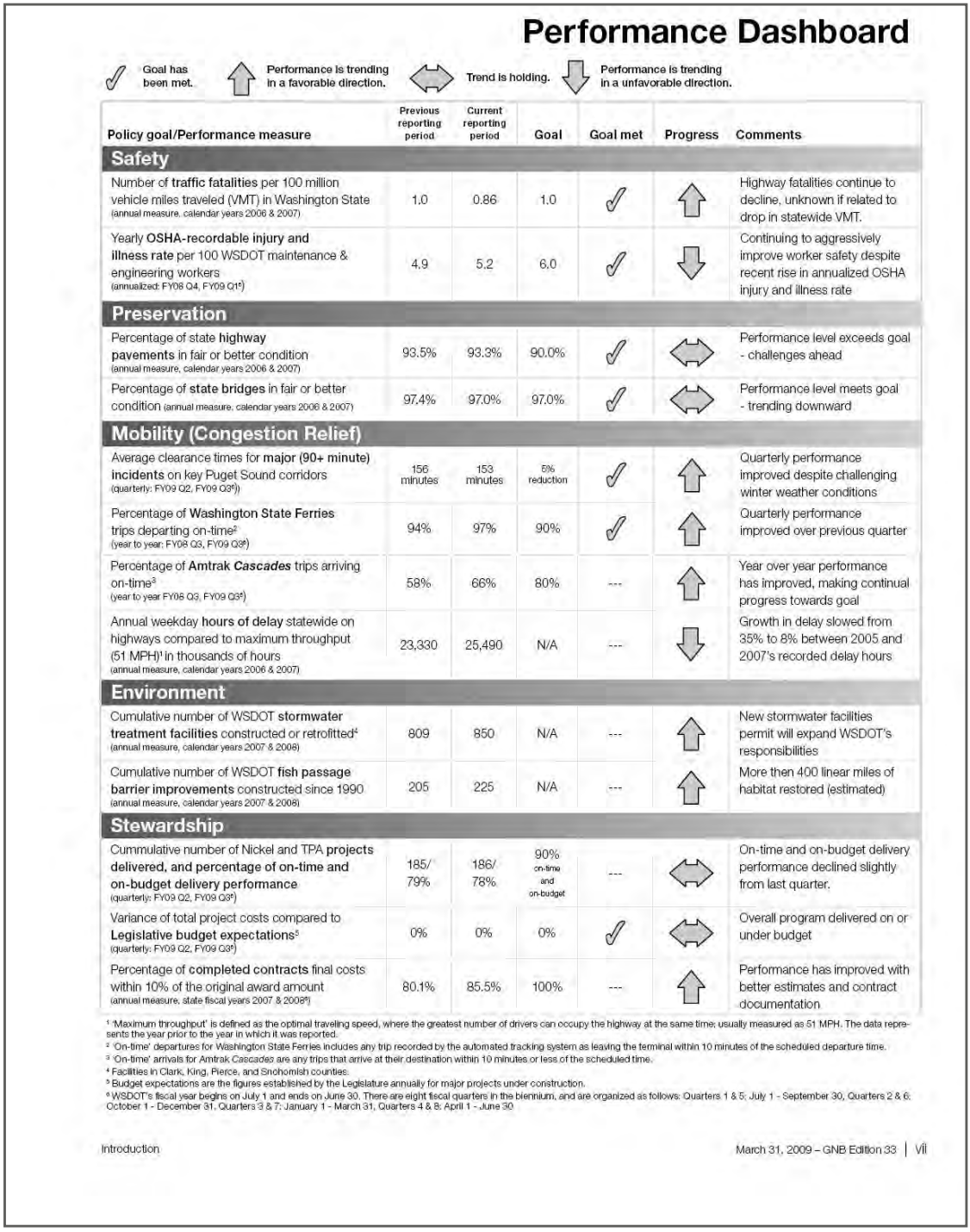
Visit wwwi for more information or contact Scott Marion, Organizational Results, at (573) 526-2119 or Bradley.Marion@modot.mo.gov.

Figure 4.1 *Performance Plus: MoDOT's employee incentive program*

Performance measurement is a vital element of the best practices in project management. For example, each quarter, MoDOT utilizes a highly transparent performance measurement system that tracks 18 different tangible result areas as a means of ensuring project accountability. The department's STIP project cost estimates for any current or prior year serve as the baseline for all STIP reporting and tracking, including the accountability report, which the state legislature requires.

WSDOT is also a national leader in performance measurement. It uses *The Grey Notebook* primarily to demonstrate to the state legislature and the public its accountability for program

and project delivery; it also serves to manage fiscal constraint. Figure 4.2 is an example of *The Grey Notebook*'s performance dashboard. KDOT utilizes its Comprehensive Program Management System (CPMS) to track and manage project costs; it is currently updating this system.



Performance Dashboard

✓ Goal has been met. ↑ Performance is trending in a favorable direction. ↔ Trend is holding. ↓ Performance is trending in a unfavorable direction.

Policy goal/Performance measure	Previous reporting period	Current reporting period	Goal	Goal met	Progress	Comments
Safety						
Number of **traffic fatalities** per 100 million vehicle miles traveled (VMT) in Washington State (annual measure, calendar years 2006 & 2007)	1.0	0.86	1.0	✓	↑	Highway fatalities continue to decline, unknown if related to drop in statewide VMT.
Yearly **OSHA-recordable injury and illness rate** per 100 WSDOT maintenance & engineering workers (annualized: FY08 Q4, FY09 Q1[6])	4.9	5.2	6.0	✓	↓	Continuing to aggressively improve worker safety despite recent rise in annualized OSHA injury and illness rate
Preservation						
Percentage of state **highway pavements** in fair or better condition (annual measure, calendar years 2006 & 2007)	93.5%	93.3%	90.0%	✓	↔	Performance level exceeds goal - challenges ahead
Percentage of **state bridges** in fair or better condition (annual measure, calendar years 2006 & 2007)	97.4%	97.0%	97.0%	✓	↔	Performance level meets goal - trending downward
Mobility (Congestion Relief)						
Average clearance times for **major (90+ minute) incidents** on key Puget Sound corridors (quarterly: FY09 Q2, FY09 Q3[6])	156 minutes	153 minutes	5% reduction	✓	↑	Quarterly performance improved despite challenging winter weather conditions
Percentage of **Washington State Ferries** trips departing on-time[2] (year to year: FY08 Q3, FY09 Q3[6])	94%	97%	90%	✓	↑	Quarterly performance improved over previous quarter
Percentage of **Amtrak *Cascades*** trips arriving on-time[3] (year to year FY08 Q3, FY09 Q3[6])	58%	66%	80%	---	↑	Year over year performance has improved, making continual progress towards goal
Annual weekday **hours of delay** statewide on highways compared to maximum throughput (51 MPH)[1] in thousands of hours (annual measure, calendar years 2006 & 2007)	23,330	25,490	N/A	---	↓	Growth in delay slowed from 35% to 8% between 2005 and 2007's recorded delay hours
Environment						
Cumulative number of WSDOT **stormwater treatment facilities** constructed or retrofitted[4] (annual measure, calendar years 2007 & 2008)	809	850	N/A	---	↑	New stormwater facilities permit will expand WSDOT's responsibilities
Cumulative number of WSDOT **fish passage barrier improvements** constructed since 1990 (annual measure, calendar years 2007 & 2008)	205	225	N/A	---	↑	More then 400 linear miles of habitat restored (estimated)
Stewardship						
Cummulative number of Nickel and TPA **projects delivered, and percentage of on-time and on-budget delivery performance** (quarterly: FY09 Q2, FY09 Q3[6])	185/ 79%	186/ 78%	90% on-time and on-budget	---	↔	On-time and on-budget delivery performance declined slightly from last quarter.
Variance of total project costs compared to **Legislative budget expectations**[5] (quarterly: FY09 Q2, FY09 Q3[6])	0%	0%	0%	✓	↔	Overall program delivered on or under budget
Percentage of **completed contracts** final costs within 10% of the original award amount (annual measure, state fiscal years 2007 & 2008[6])	80.1%	85.5%	100%	---	↑	Performance has improved with better estimates and contract documentation

[1] 'Maximum throughput' is defined as the optimal travelling speed, where the greatest number of drivers can occupy the highway at the same time; usually measured as 51 MPH. The data represents the year prior to the year in which it was reported.
[2] 'On-time' departures for Washington State Ferries includes any trip recorded by the automated tracking system as leaving the terminal within 10 minutes of the scheduled departure time.
[3] 'On-time' arrivals for Amtrak *Cascades* are any trips that arrive at their destination within 10 minutes or less of the scheduled time.
[4] Facilities in Clark, King, Pierce, and Snohomish counties.
[5] Budget expectations are the figures established by the Legislature annually for major projects under construction.
[6] WSDOT's fiscal year begins on July 1 and ends on June 30. There are eight fiscal quarters in the biennium, and are organized as follows: Quarters 1 & 5: July 1 - September 30, Quarters 2 & 6: October 1 - December 31, Quarters 3 & 7: January 1 - March 31, Quarters 4 & 8: April 1 - June 30

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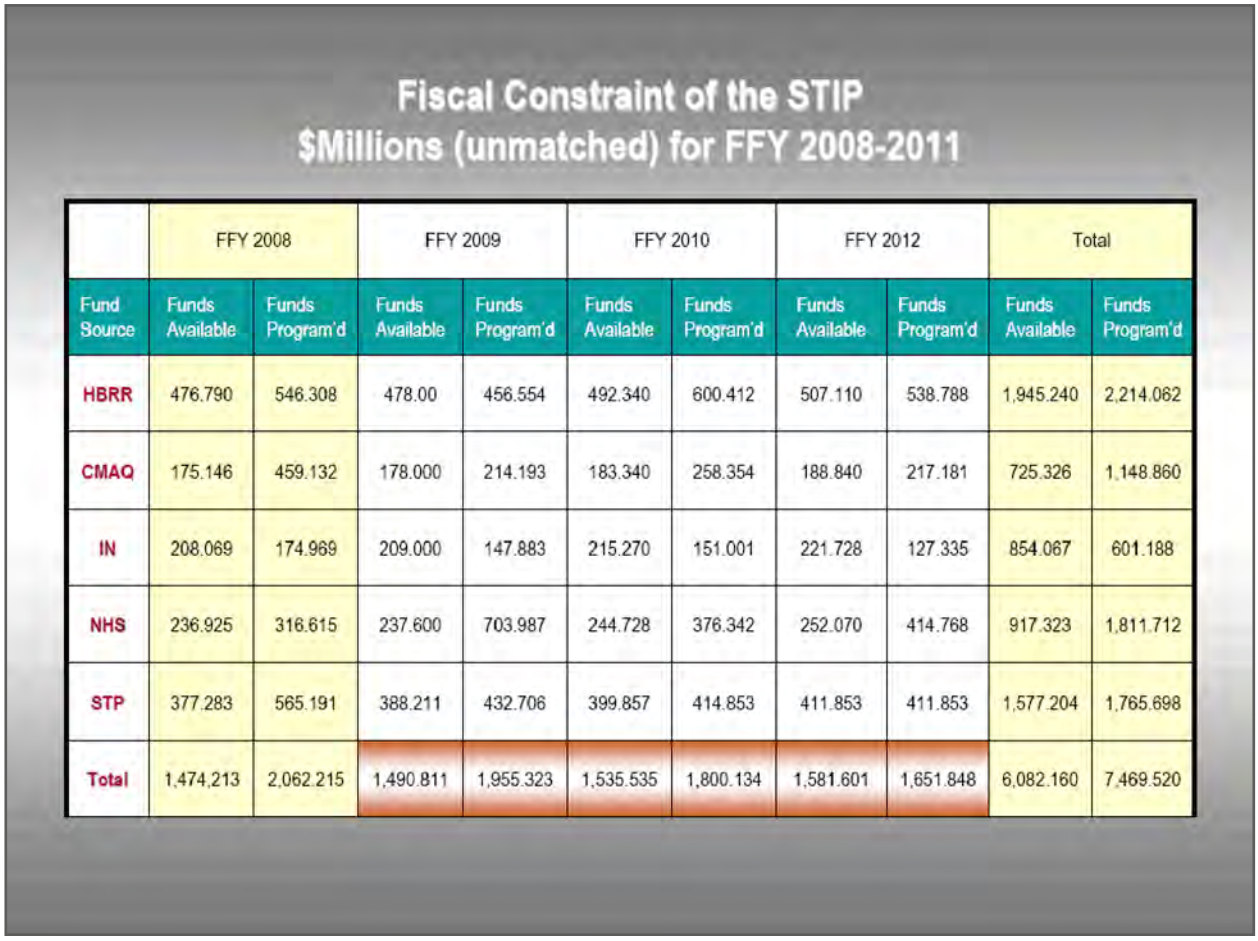
Figure 4.2 *WSDOT **The Grey Notebook** Performance Dashboard*

An additional best practice is the focus that several states place on careful project scoping to help ensure that the cost estimate in this phase does not simply represent a back-of-an-envelope approach that, in many situations, dramatically underestimates the ultimate project cost. Specifically, CDOT and WSDOT have given improved scoping a high priority, with positive results on fiscal constraint compliance and realistic scopes that reasonably hold up during the design phase. On a related matter, VTrans, CDTC, and others make a conscious decision to place projects on a TIP only when the specific project phase(s) is clearly ready to advance. This best practice helps to ensure that projects do not need to be removed from a TIP due to insufficient planning. In addition, VTrans relies upon a Project Development Team to oversee project development. This team, which comprises division and section heads, must approve project cost changes in excess of 25 percent. If a project bid price comes in above the estimate, the department will rebid the project unless the cost can be accommodated by a built-in overrun amount, which is set aside.

Several other best practices appear to assist in fiscal constraint. CDOT is the only state the scan team found that utilized the STIP as the primary tool for program management, including the state-funded program. This approach avoids the possibility of any inconsistency between the STIP and a second program management tool, which some DOTs rely upon as their principal program management tool. CDOT's STIP is directly tied to the department's financial management organization, which tracks all revenue in support of its program. With support from FHWA and FTA, CDOT has decided not to repeat the public review process that is used for TIP amendments when it incorporates this same change into its STIP. This best practice expedites the ultimate approval time for an amendment while preserving fiscal constraint.

Another best practice utilized in New York is an ESTIP developed by the New York State Division Office of the FHWA in cooperation with NYSDOT. Originally used in the four downstate MPOs, including NYMTC, MPOs statewide are now using the ESTIP. NYSDOT's regional offices are also utilizing the ESTIP to manage the rural portion of the STIP. The department now plans to use the ESTIP for development of the next STIP. The ESTIP has eliminated the need for duplicate data entry. NYMTC also uses a feature of the state's ESTIP to ballot its members electronically on individual TIP amendments, again shortening the timeframe for processing amendments. NYMTC staff utilizes the ESTIP and its own knowledge of project status among its operators to help identify cost offsets that can be used for projects whose cost estimates have increased enough to warrant a TIP and STIP amendment. This role facilitates the approval process, which can be lengthy, for such amendments.

NYSDOT makes a current ESTIP regularly available on its official Web site for public access. It also tracks its regional programming through comparisons of funds allocated (i.e., federal revenues available vs. funds programmed). See Figure 4.3 for an example.



Fiscal Constraint of the STIP
$Millions (unmatched) for FFY 2008-2011

	FFY 2008		FFY 2009		FFY 2010		FFY 2012		Total	
Fund Source	Funds Available	Funds Program'd	Funds Available	Funds Program'd	Funds Available	Funds Program'd	Funds Available	Funds Program'd	Funds Available	Funds Program'd
HBRR	476.790	546.308	478.00	456.554	492.340	600.412	507.110	538.788	1,945.240	2,214.062
CMAQ	175.146	459.132	178.000	214.193	183.340	258.354	188.840	217.181	725.326	1,148.860
IN	208.069	174.969	209.000	147.883	215.270	151.001	221.728	127.335	854.067	601.188
NHS	236.925	316.615	237.600	703.987	244.728	376.342	252.070	414.768	917.323	1,811.712
STP	377.283	565.191	388.211	432.706	399.857	414.853	411.853	411.853	1,577.204	1,765.698
Total	1,474,213	2,062.215	1,490.811	1,955.323	1,535.535	1,800.134	1,581.601	1,651.848	6,082.160	7,469.520

Figure 4.1 *NYSDOT TIP/STIP guidance: comparison of revenue available to programmed funds*

Finally, all of the DOTs the scan team visited utilize Advanced Construction (AC), but primarily as a cash management tool to help address OA limitations in any one year. To date, the impact of AC on fiscal constraint, if any, is not being shown in TIPs and STIPs. NYSDOT, however, does show which federal fund category will be obligated on a project once it is converted from AC to regular federal aid.

CHAPTER 5

Key Best Practice Findings

The best practices identified in this report clearly assist states and MPOs to comply with federal fiscal constraint requirements. Many of these practices also facilitate the inevitable changes that must be made, especially to TIPs and STIPs. The scan team acknowledges that not all practices can be readily transferred to any other MPO or DOT, since each must operate within its own context, including state statutes. Nevertheless, this scan highlights several outstanding practices or strategies that, however modified or applied in a given state or MPO, are likely to result in improved compliance and management of transportation plans and programs. The ones discussed below appear to have broad application across diverse states and MPOs, regardless of their unique operating environments. The most important of these include the following:

- Whenever transportation planning, programming, project cost estimating, and fiscal management are housed in a specific DOT, it is critical that the linkages between cost estimating and revenue forecasting functions work seamlessly, throughout the life of a program. Those responsible for selecting projects to be advanced and for developing scopes and cost estimates should have a clear understanding of the revenues that will be available to support these projects. Although these functions may be discrete within the DOT, strong communication between them is critical.
- Revenue and cost estimation need strong central leadership in each DOT so that fiscal discipline is maintained. Leadership at the senior executive level is important to creating a culture concerned about managing within fiscal constraint.
- It is crucial that revenue and cost estimation methodologies and guidelines be shared and, preferably, developed jointly with MPOs, and that MPOs have the necessary flexibility to respond to different revenue and cost factors in their own regions. Some degree of uniformity is helpful, but estimates should be guided by local circumstances.
- *Comprehensive program and project management systems, backed by strong executive leadership,* are essential to maintain fiscal constraint and the overall quality of the delivered program. Control of project cost and schedule volatility is the best means to avoid continual changes to plans and programs and to ensure fiscal constraint compliance.
- Communication and outreach to the public and stakeholders regarding the realities of available revenues and the reasons for any necessary project amendments are critical to maintaining fiscal discipline and credibility for transportation programs with the authorizing entities and the public.
- States and MPOs can limit the administrative burden imposed by fiscal constraint requirements if they are allowed to fully utilize the flexibility provided in current law

and regulation and work closely with their federal partners. While this flexibility does not address all of the concerns about current rules on fiscal constraint, its use clearly facilitates compliance in the states and MPOs that can avail themselves of it.

- While most states and MPOs expressed concern about plans and programs becoming primarily accounting documents, it is clear that most are using approaches that preserve the other essential functions of both, including plans that continue to present a transportation vision for the future. Also, while recent revenue declines across the board have made planning more challenging, it remains an important function that calls for strong executive leadership so that fiscal problems do not undermine the planning and programming processes.
- Most states have adopted a reasonably simple way to forecast inflation for plans and programs. The application of YOE should be monitored and adjusted to ensure that inflation rates are not unnecessarily distorting future project costs. While a uniform inflation rate across a particular state might be simple, it might also be inappropriate for a specific region. Regardless of the methodology used, a best practice that could serve all well includes making this methodology available to MPOs, stakeholders, and the public to enhance transparency and accountability.

In conclusion, while most states and MPOs are concerned about the prescriptive federal approach to fiscal constraint and YOE compliance, they also believe that their best practices are enabling them to ease compliance and achieve the objectives of federal law and regulation.

CHAPTER 6

Recommendations for Alternative Strategies to Accomplishing Fiscal Constraint and YOE

Following its site visits and review of the material provided by states and MPOs, the scan team concludes that the stated objectives for fiscally constrained MPO plans, TIPs, and STIPs are appropriate and endorsed in general by the transportation community. These objectives improve the transparency and accountability in these key transportation documents. All agree that USDOT has a legitimate and constructive interest in ensuring the fiscal integrity in the expenditure of federal funds. Clearly, the many best practices that this scan identifies play a constructive role in a largely successful effort by states and MPOs to comply with federal law and regulation. Despite this success, the scan team shares many of the concerns expressed by the organizations it reviewed and by those articulated in national discussions of fiscal constraint and YOE over the past 18 years (i.e., since the passage of ISTEA).

Consequently, the team offers the following recommendations for achieving the broad objectives of fiscal constraint. These recommendations, which may be worthy of further examination, would strengthen the roles of MPO plans as visionary in nature and TIPs and STIPs as listings of near-term projects intended to initiate implementation of this vision. At the same time, these recommendations support the notion that these documents should serve as expressions of reasonable and defensible planning and programming decisions that meet the real challenges facing transportation in the United States while maintaining reasonable fiscal constraint.

The scan team's principal recommendation, if implemented, represents a fundamental change to the way fiscal constraint objectives are achieved. It draws upon the transportation community's growing interest in encouraging greater use of *performance and systems management strategies, including systematic use of performance measurement*, to achieve these objectives. This approach, described more fully below, would shift the national and local focus to transparency and accountability on fiscal and programmatic outcomes rather than on processes for day-to-day management of plans and programs. It would also provide states and MPOs greater responsibility for developing and carrying out strategies for ensuring the fiscal integrity of MPO plans, TIPs, and STIPs. Consistent with the existing federal role in the project design process, this change would define the federal role as one of approving these overall strategies rather than day-to-day oversight of fiscal constraint.

Such a strategy also entails developing clear definitions of the distinct but related federal and state roles in achieving and maintaining fiscal constraint and accounting for YOE. The federal role would be to:

- Define broad goals for any performance or systems management approach that a state or MPO may adopt
- Identify for states and MPOs the state of the art in best practices around the country in meeting the objectives
- Serve as the quality assurance agent that reviews long-term state and MPO approaches to carrying out performance management and maintaining fiscal constraint while removing itself from day-to-day approvals on amendments to approved plans and programs

The corresponding state DOT role would be to:

- Design and implement its own specific performance and systems management strategies that comply with the federal fiscal constraint objectives while responding to its own unique characteristics
- Identify and develop quality control measures and targets for ensuring that performance management reasonably accomplishes fiscal constraint objectives

There is undoubtedly a variety of ways to carry out this fundamental change, but a few might include the following:

- Create flexibility and incentives for states and MPOs *commensurate with their ability to demonstrate quality control on fiscal constraint outcomes over the life of a plan or program*
- Provide a framework for DOTs and, as appropriate, MPOs, to enhance their own *performance management* system, that among other objectives, demonstrates their ability to develop and maintain fiscally constrained plans and programs
- Allow states and MPOs the flexibility to rely upon an administrative process for managing plans and programs, so long as their performance management approach demonstrates reasonable fiscal accountability, with the possible exception of nonexempt project amendments in air quality nonattainment or maintenance areas

If this fundamentally different approach to fiscal constraint cannot be accomplished, for whatever reason, there are other, less substantial changes that would achieve the objectives while making a good-faith effort to address state and MPO concerns about current requirements.

First, remove the requirement that TIPs, and STIPs be fiscally balanced by year. Many states and MPOs argue that the annual requirement is too restrictive and inflexible for large and complex programs. Therefore, this recommendation is premised on the view that fiscal constraint over the life of a program will still achieve Congress's intent while providing necessary management flexibility to the states and MPOs. It is also consistent with one of the objectives of Advance Construction, which enables a state to keep projects on schedule, notwithstanding one year's OA limit. Under this approach, states and MPOs should still be required to demonstrate fiscal constraint over the total program period.

Second, allow for periodic demonstrations of fiscal constraint (e.g., quarterly, annually, or some

other reasonable period) instead of requiring it project by project. An exception to this could be for nonexempt projects in air quality nonattainment areas. This approach would reduce the almost daily work that some states and MPOs face in carrying out amendments and "keeping the checkbook" for every such transaction.

Third, eliminate or limit the YOE requirement as it currently stands and instead require that DOTs and MPOs assess the potential risk that future revenues may not keep up with inflationary cost increases. MPO plans, TIPs, and STIPs could be asked to provide and make available to the public an assessment of these risks, perhaps even to suggest potential impacts on programs and projects under possible or likely scenarios for the future. However, this change might also allow costs and revenues to be expressed in present value, at the individual state's discretion.

Finally, if the current YOE is retained in general, eliminate, at a minimum, the current requirement that MPO plans express project costs in terms of YOE beyond year 10 in the plan. MPOs could still be asked to provide an assessment of inflationary risks for the life of the plan, but this approach would give flexibility for a time period that is difficult to forecast and facilitate visioning and transparency of potential future outcomes.

In conclusion, both the fundamental change identified above as well as the other suggested changes would provide some day-to-day administrative relief to states and MPOs without sacrificing the goals of fiscal constraint. It would be less likely for plans and programs to become primarily accounting documents; they would continue, instead, to serve the broader purposes envisioned for them. The recommendation to focus upon performance management is also consistent with what is likely to be an area of concentration in reauthorization. Performance management can serve a multitude of objectives, but it appears to be particularly appropriate for promoting transparency and fiscal accountability.

CHAPTER 7

Planned Implementation Activities

The scan team's approach to implementation of its findings and recommendations will be designed to inform AASHTO, TRB, state DOTs, and MPOs of the best practices that were identified in the study, including the major recommendations for effective ways to comply with current federal requirements.

In addition, through outreach to AASHTO's Standing Committee on Planning (SCOP), the team intends to provide its recommendations, especially those that may entail statutory and regulatory changes, so that they can be used to help shape transportation reauthorizing legislation due in late 2009. Some of these recommendations will require further study or research. Various forms of communication will be considered, including:

- Presentations to SCOP and perhaps AASHTO's Executive Committee, TRB, and the Association of Metropolitan Planning Organizations (AMPO)
- Presentations to FHWA and FTA
- Webinars for state DOT and MPO participants

Appendix A:

Amplifying Questions

Overview of the Agency Organization and Process for Transportation Planning

1. Please provide a brief overview of how your agency is organized. Where is transportation planning in the organization? Where is the program/project management function located in the agency? Where in the agency is the responsibility for working with the state's MPOs, including the development of plans and TIPs? Where is responsibility for developing and managing the STIP?

2. How many MPOs are in the state? How many are TMAs? How many and which specific MPOs are in nonattainment areas? How specifically does the DOT and other state agencies relate to the MPOs? Is DOT a voting member playing an identical role to other MPO members?

3. Briefly describe your state's public transportation programs. Is public transportation owned and operated by the DOT or by some other entity(ies)?

4. What are the major fund sources for the state's transportation program? What percentage of the program is funded with federal funds? Does state funding derive from your general fund or a dedicated transportation fund? What percentage of your program is funded as "pay as you go" and what percentage is funded through bonding of various types? Has your state utilized any "innovative funding," and, if so, please prove a few examples? Do you utilize public/private partnerships to fund transportation? How are the nonhighway modes, such as rail, ports, and general aviation, managed and funded?

5. Who makes decisions regarding selection of transportation projects: your agency, the legislature, the transportation commission, or some other mechanism?

6. Where is responsibility for *revenue forecasting* located? Where is responsibility for developing and managing *fund allocations* for program development? What methodologies do you use to project future revenue growth at both the state and federal levels? Do you utilize the flexibility afforded in federal law and regulation to "flex" federal highway funds to public transportation?

7. Where is responsibility located for developing project cost estimates at the planning phase? Is there one office in the agency responsible for overseeing cost estimation throughout the life of a project? How are project hand-offs managed during the life of a project? How often do you require cost estimates to be formally updated? Does cost estimating responsibility shift to another part of the agency during each phase of a project? Specifically, how are change orders during the construction phase managed? Are reasonable contingencies required for most projects to guard against the cost impact of discovering changed conditions, scope changes, or unanticipated inflation? What, if any, is your guidance on including contingencies in the cost estimate at different phases of a project's development?

8. Have you utilized the authority to provide cost ranges for projects that are beyond the tenth year of your plans?

Transportation Program Development/Planning—TIP and STIP Development

1. Before we explore the detail, please provide an overall assessment of how your state and the MPOs are managing compliance with fiscal constraint and YOE federal requirements.
2. Describe your statewide and MPO planning process. How often is the statewide plan updated? How often are MPO plans updated?
3. Please describe your working relationship with the various MPOs in your state.
4. Please provide an overview of the program development process in your agency. Do you establish strategic goals/priorities? Describe your methodology for developing *revenue forecasts* for both *long-term plans and program development, including TIPs and the STIP*. Do MPOs participate in developing revenue estimates to be used in their plans and/or the TIP?
5. Do you have a regular cycle for performing program updates? How often do you develop new TIPs and a new STIP? What is the duration for approved TIPs and the STIP? What is the time cycle and process for TIP/STIP revisions between major updates?
6. How are other modes such as rail, ports, and aviation funded in your state?
7. Do state budget cycles impact your regular cycle for program updates? If so, how?
8. What is your fund allocation methodology? Are allocations developed for specific goals/priorities/transportation operators? Could you provide examples of these goals/priorities? Are program decisions made centrally in the agency or in a decentralized manner through districts, regions, and/or MPOs?
9. Do you allocate federal funds based upon apportionment, obligation authority, or some other means? Which do you use in determining fiscal constraint? Are there specific formulas used for each federal fund source? Are allocations tied to program strategic goals/priorities? Is the maintenance program included in program development or are these investments programmed and managed separately? What specific activities do you generally include in your maintenance program? Do you utilize federal funds for any of these activities, and, therefore, include them in your TIPs/STIP?
10. Do you have a formal cost *estimating methodology* applied uniformly across the state? Do you have a formal project management system responsible, in part, for ensuring that cost estimates are appropriately managed from project concept thru construction completion?
11. Do you provide to recipients that are eligible to use federal transportation funds (e.g., DOT districts, local governments, MPOs, and transit operators) guidance on how they should comply with federal requirements on achieving *fiscal constraint* and expressing project costs in terms of *Year of Expenditure (YOE)*? Do you understand the rationale for requiring costs in YOE and do you agree with it? Do you provide statewide guidance on *best cost estimating practices* to eligible project sponsors in the state? Do you provide a uniform methodology for calculating

project inflation in future years of the program? If so, please describe this methodology. Do you provide flexibility to operators in calculating inflation for their individual programs?

12. Do you have air quality nonattainment and/or maintenance areas in your state? If so, have fiscal constraint issues impacted air quality conformity approvals? If so, how have you responded to this issue?

13. How do your plans, TIPs, and STIP respond to the federal requirement that there be "reasonable assurance that the federally supported transportation system is being adequately operated and maintained?"

14. Do individual MPOs develop their own requirements so that operators funded with federal funds have cost estimating methodologies that meet the federal requirements for YOE? Is MPO guidance to these operators adequate? Does the MPO have adequate resources to develop guidance and oversee implementation?

15. If an MPO or other federal funds recipients develop a TIP or set of projects that exceed federal fiscal constraint requirements, or does not express project costs in terms of YOE, does the agency have a policy or set of practices on how you respond to this situation?

16. For your state's STIP, is there consistency between FHWA and FTA on definitions of fiscal constraint and application of YOE? Are you provided any latitude in conforming to federal requirements?

17. In summary, what are your most effective mechanisms for meeting federal requirements for fiscal constraint and expressing costs in terms of YOE? What are the most significant issues you face in trying to meet these requirements?

18. Has your use of any innovative contracting procedures, such as design/build, affected your efforts to comply with fiscal constraint?

19. How has the recent "stimulus" impacted efforts to comply with fiscal constraint, if at all?

Implementing and Managing Approved Long-Range Plans, TIPs, and STIPs

1. For approved TIPs and STIPs, does the agency have a formal policy for meeting federal fiscal constraint and YOE requirements? Through this policy or some other mechanism, do you identify threshold changes that require amendments to a TIP or STIP to maintain fiscal constraint? If so, would you identify these thresholds and how the amendment process is conducted? Do you distinguish between major and minor project cost amendments? If so, please describe.

2. Do individual MPOs determine their own processes for maintaining fiscal constraint as project costs change over time?

3. Could you describe the most effective examples for how an individual MPO maintains fiscal

constraint during the life of its TIP? Do change orders during construction or project closeouts impact efforts to maintain fiscal constraint? How do you manage project cost changes during construction within the STIP?

4. What are the major issues you face in attempting to maintain fiscal constraint?
5. Have FHWA and FTA approved the state's methodologies for maintaining fiscal constraint?
6. Have your current program and project management systems successfully controlled or limited the volatility in project costs during the life of the STIP? What are some of the most important elements of your systems that have led to this result? If volatility in costs continues to be a serious problem, what steps would you consider to reduce this volatility? How do you address a project bid that substantially exceeds the amount programmed for that specific project in your STIP? What is your approval process for such a bid and how is fiscal constraint maintained when such a bid is approved?
7. Are there changes to the existing fiscal constraint and YOE federal planning requirements that you would recommend in the reauthorization of SAFTEA-LU? What specific changes, if any, would allow you still to achieve the objectives of these requirements? Why would these changes represent an improved approach to fiscal constraint?

MPO Responses to Fiscal Constraint and YOE Requirements (Questions for MPO Staff)

1. Please describe the overall structure of your MPO, including the membership. Please describe the state DOT's administrative and/or programmatic relationship to the MPO.
2. How frequently do you update your plan and your TIP? What is the duration for each? How frequently are project costs and schedules updated on your TIP?
3. What is the MPO's role, if any, in developing both *revenue and project cost estimates* that are used for your long-range plan and your TIP? Do you have a methodology for developing revenue forecasts for your plan and TIP? Is there an MPO-wide process for managing cost estimates that are included in you plan and TIP? What role, if any, do you play in determining federal allocations that are available to the MPO?
4. Do you or does the state establish priorities for programming available federal aid? Please describe the priority-setting process used by your MPO.
5. Please describe how you establish fiscal constraint as your TIP is developed. Do you provide eligible project sponsors guidance on cost estimating? If so, please describe. What guidance, if any, do you provide your individual operators on expressing project costs in terms of YOE or do they determine their own methodology?
6. Once your TIP is approved and incorporated into the STIP, how do you ensure that fiscal constraint is maintained for the duration of the TIP? Describe your process for project amendments during the TIP's life. Are there clear thresholds for project cost and schedule

changes that require an amendment? Do these vary by size of the specific project? Do you have a procedure for addressing minor changes to project costs and schedules that does not require a new demonstration of fiscal constraint?

7. What practices have you found particularly effective in establishing compliance with fiscal constraint and YOE requirements? What issues, if any, do you still face in complying with these requirements?
8. Are there changes in the current fiscal constraint and YOE planning requirements that you would recommend during reauthorization of SAFETEA-LU?

FHWA and/or FTA Division Perspective on Fiscal Constraint and YOE Compliance

1. Please provide an overall assessment of how your state and the MPOs are meeting the compliance requirements for fiscal constraint and YOE.
2. Are you in agreement with your sister federal agency on what is required to ensure compliance at both the MPO and state levels?
3. What are some of the best practices that have assisted states and MPOs in meeting the requirements?
4. What issues related to compliance are you continuing to work with them on?
5. Are there specific steps that you are recommending that they consider in future compliance efforts?
6. Have there been any specific issues related to compliance in air quality nonattainment or maintenance areas?
7. Are there changes to the current regulations that you would recommend for consideration in order to better achieve the objectives of fiscal constraint and YOE?

Appendix B:

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Pictured (left to right): *Thomas W. Clash, Jeanne Stevens, Timothy A. Henkel, Tracy Larkin-Thomason, Ben Orsbon, Michael Wright, W. David Lee, Harlan Miller*

Appendix C:

Domestic Scan 08-01 Team Members Biographic Sketches

Timothy A. Henkel (AASHTO Co-Chair) is currently the Division Director for the Modal Planning and Program Management Division with the Minnesota Department of Transportation (DOT). In his current position, he manages the Office of Investment Management, Freight and Commercial Vehicle Operations, Transit, Aeronautics, and Transportation Data and Analysis. Henkel's transportation career spans 26 years, including work with local government and the private sector. During his 24 years with Minnesota DOT, Henkel worked in the areas of planning, program management, and highway/rail project development. He received a Bachelor of Science degree from Bemidji State University and a certificate in Civil Engineering and Land Surveying from Dunwoody College.

Harlan Miller (FHWA Co-Chair) is the Planning, Oversight, and Stewardship Team Leader in the Federal Highway Administration (FHWA) Headquarters Office of Planning. In this position, he serves as a lead specialist on matters relating to transportation planning. Miller is responsible for the development and implementation of the statewide and metropolitan transportation planning regulations. The planning regulations contain provisions concerning fiscal constraint of metropolitan transportation plans, and statewide and metropolitan transportation improvement programs. Miller has been with the FHWA for 20 years, including eight spent as the Division Planning Engineer in the FHWA Utah Division and five as the Missouri Division Assistant Planning and Research Engineer. He has spent the last five years in the FHWA's Office of Planning in Washington DC. Miller has a Bachelor of Science degree in Civil Engineering from Arizona State University and a Master of Science degree in Civil Engineering from the University of Illinois.

Thomas W. Clash (Subject Matter Expert) has more than 20 years of experience in several high-level management positions with the New York State Department of Transportation (NYSDOT) before retiring in early 2008. He initially served as Executive Assistant to the Commissioner between 1987 and 1990. He then served as the Director of the Office of Planning and Program Management from 1990–1998 with overall responsibility for implementing the planning and program requirements of both ISTEA and TEA-21. In this role, Clash administered all federal transportation funds coming to New York State as well as state funds. His management responsibilities included the state's MPO planning program, encompassing the Unified Planning Work Program (UPWP) and TIP development as well as MPO long-range plans, and development and maintenance of the STIP. During this same period, he served as Chairman of the Program, Fiscal, and Administrative Committee for the New York Metropolitan Planning Committee, which serves as the MPO for the New York City metropolitan area. He worked closely with the FHWA and FTA on their development of planning regulations and policy guidance under both pieces of legislation, including the effort to apply various definitions of fiscal constraint to individual TIPs and the STIP. Clash worked closely with AASHTO's SCOP Committee during this period and was directly involved in New York State's efforts to implement asset management in NYSDOT. He also had overall responsibility for development and implementation of New York State's comprehensive highway and bridge program, funded by both the federal and state governments. Most recently, Clash led NYSDOT's effort to develop its statewide master plan for transportation, which was completed in 2005. He was asked to revitalize the state's transportation program

development process, including the coordination of state and MPO program development. That effort culminated in the submission of a new five-year transportation plan to the state legislature in early 2008.

Tracy Larkin-Thomason is the Assistant Director of the Planning Division with the Nevada Department of Transportation (NDOT). Ms. Larkin-Thomason has more than 22 years of broad transportation experience with the Nevada Department of Transportation and has held positions in the areas of planning, operations, maintenance engineering, traffic engineering, roadway bridge design, and roadway civil engineering. Currently, as the Assistant Director for Planning, she administers all planning and project programming efforts for the Nevada Department of Transportation, including research, program development, traffic information and data analysis, operations analysis, federal programs, roadway systems, and intermodal programs. She administers preparation of the Nevada STIP and coordinates with the local MPOs to help develop the local TIPs and the local Long-Range Transportation Plans. Larkin-Thomason has Bachelor of Science degree in Civil Engineering from the University of Nevada, Reno, and is a licensed Civil Engineer in the State of Nevada. She is also certified as an ITE Professional Traffic Operations Engineer and a Nevada Certified Public Manager.

W. David Lee is the Florida Department of Transportation's Administrator for Statewide Planning and Policy Analysis. Lee manages available resources to accomplish the development of a strategic planning process that supports the Department's annual budget request, program and resource plan, and five-year work program. This responsibility includes trends and conditions analysis, development of agency goals and objectives, and a performance monitoring/reporting process. He provides policy analysis and develops policy alternatives to support agency decision-making, the emphasis of which is placed on implementation of federal and state law and implementation of the Florida Transportation Plan. Lee joined the Department in December 1988. Prior to coming to Florida, he was a Program Director for the American Association of State Highway and Transportation Officials (AASHTO). He monitored and reported on Congressional activities affecting transportation, including bill analysis and testimony preparation. He worked with state departments of transportation in the development of transportation policies, standards, and guidelines. He also served as liaison with other public interest groups and federal agencies. Prior to joining AASHTO in 1975, Lee was with the Virginia Department of Transportation. Lee received his Bachelor of Science degree in Civil Engineering from Purdue University in 1972. He is a Registered Professional Engineer in Florida and Virginia.

Ben Orsbon is currently working for the Office of the Secretary, South Dakota Department of Transportation, on policy and communication issues as Special Projects Coordinator. In the state and local planning area, he was a Program Manager for the Office of Planning and Programs, South Dakota Department of Transportation, for many years and was responsible for long- and short-range transportation planning, liaison with Metropolitan Planning Organizations, pavement management, capital improvements programming, and special studies. Orsbon also has experience in land use and environmental planning. He served as Chair of the Western Association of State Highway and Transportation Official's Standing Committee on Planning/Intermodal and served

on AASHTO's Standing Committee on Planning, the Bottom Line Reauthorization Team, the Highway Team, the Metropolitan Team, the Reauthorization Task Force, and numerous other working groups. Orsbon was a finalist in the 2006 TRB McDonald Traffic Congestion Challenge. He is a founding member and the first president of Western Planning Resources Incorporated, which is a nonprofit organization providing planning training to mostly rural and small urban communities in 14 western states. He was the past president of the Western Central Chapter of the American Planning Association, covering Montana, Wyoming, and the Dakotas, and he was also an editor of the AICP study manual. Orsbon received a Master's degree in Regional Planning with a Mellon Fellowship and a Bachelor of Arts degree in Political Science from the University of North Carolina at Chapel Hill.

Jeanne Stevens is the Director of the Long-Range Planning Division at the Tennessee Department of Transportation (TDOT). Her responsibilities include the development of the state's Long-Range Transportation Plan and 10-Year Strategic Program, as well as programs for freight, systems, and corridor planning; metropolitan and rural planning organizations; travel demand modeling; roadway inventory, and GIS mapping; and statewide research and technology transfer. Financial concerns were a major focus of the state's most recent Long-Range Plan, which led to the formation of a special state legislative committee to review options for expanding transportation revenue. In addition, Stevens has implemented processes to improve coordination with TDOT's Programming Division on metropolitan plans and TIPs. Stevens also has experience in fiscal constraint issues from the Metropolitan Planning Organization (MPO) perspective. Before joining TDOT, she was the director of the MPO for the Nashville, TN, region. In this role, she directed transportation planning and programming for an air quality nonattainment area of about 1.2 million people. During this time, the MPO adopted a number of measures to improve fiscal management of the TIP, including a contingency fund and procedures to account for cost inflation. Stevens is a graduate of Duke University and earned a Master's degree in Urban and Regional Planning from the University of Tennessee. She is a member of the American Institute of Certified Planners and the Institute of Transportation Engineers (ITE).

Appendix D:

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Appendix E:

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