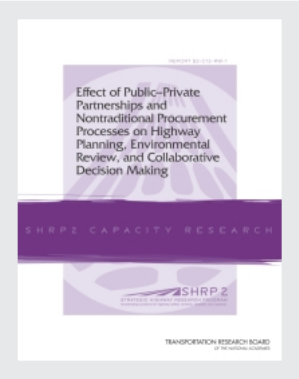

Effect of Public-Private Partnerships and Nontraditional Procurement Processes on Highway Planning, Environmental Review, and Collaborative Decision Making

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The Second
STRATEGIC HIGHWAY RESEARCH PROGRAM

SHRP 2 REPORT S2-C12-RW-1

Effect of Public–Private Partnerships and Nontraditional Procurement Processes on Highway Planning, Environmental Review, and Collaborative Decision Making

PARSONS BRINCKERHOFF

with

NOSSAMAN LLP

HS PUBLIC AFFAIRS

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Subject Areas

Finance
Highways
Planning and Forecasting

The Second Strategic Highway Research Program

America's highway system is critical to meeting the mobility and economic needs of local communities, regions, and the nation. Developments in research and technology—such as advanced materials, communications technology, new data collection technologies, and human factors science—offer a new opportunity to improve the safety and reliability of this important national resource. Breakthrough resolution of significant transportation problems, however, requires concentrated resources over a short time frame. Reflecting this need, the second Strategic Highway Research Program (SHRP 2) has an intense, large-scale focus, integrates multiple fields of research and technology, and is fundamentally different from the broad, mission-oriented, discipline-based research programs that have been the mainstay of the highway research industry for half a century.

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SHRP 2 was authorized in August 2005 as part of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU). The program is managed by the Transportation Research Board (TRB) on behalf of the National Research Council (NRC). SHRP 2 is conducted under a memorandum of understanding among the American Association of State Highway and Transportation Officials (AASHTO), the Federal Highway Administration (FHWA), and the National Academy of Sciences, parent organization of TRB and NRC. The program provides for competitive, merit-based selection of research contractors; independent research project oversight; and dissemination of research results.

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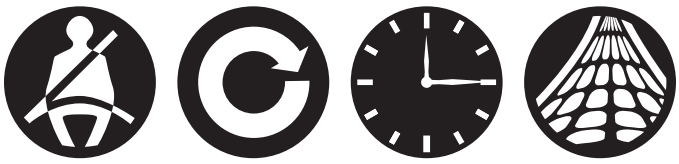

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FOREWORD

Stephen J. Andrle, *SHRP 2 Deputy Director*

Public–private partnerships and nontraditional methods for procuring new highway capacity are being introduced in the United States to generate revenue through tolls and to reduce the cost of highway construction. There are numerous variants, such as design–build, design–build–finance, design–build–finance–operate, and design–build–finance–operate–maintain. If state law permits, public agencies can use some strategies directly, or the private sector can be engaged to provide financing and engineering services. Tolling need not be involved, but it often is. How these nontraditional procurement methods relate to the transportation planning and environmental review process is not always clear, nor is it clear how public agencies can best plan to take advantage of these strategies. The objective of this project is to determine at which decision points in the transportation planning and environmental review process public–private partnerships and nontraditional procurement methods can best be considered. The report relates key decisions about the use of nontraditional procurement methods to the Decision Guide developed in other SHRP 2 work. The Decision Guide covers decision points in long-range planning, corridor planning, programming, and environmental review/permitting. This report will be of interest to anyone involved with highway finance or delivery of new highway capacity. In addition to this report, the material from this project is available in the web portal Transportation for Communities—Advancing Projects through Partnerships (TCAPP), now known as PlanWorks, at www.transportationforcommunities.com.

This report focuses on opportunities to better integrate nontraditional procurement methods and public–private partnerships into the public transportation planning process. To set the stage, it reviews the definitions of the various forms of nontraditional procurements and summarizes the applications of each type in the United States. It includes a discussion of some early experience in the 1990s, both positive and negative, and provides a list of all public–private partnership projects in the United States that are either operating or under construction as of 2012. The report discusses legal issues such as state enabling legislation, federal statutes, and planning regulations.

A significant issue with respect to public–private partnerships is timing. Does the private sector become involved before or after completion of environmental review? It is more common after environmental review is completed, because that reduces uncertainty for private investors. However, design and construction creativity may be restricted at this late stage in the process, and changes introduced by the private partners may require a supplemental environmental review. The private sector may become involved earlier in the planning process, often through the use of a predevelopment agreement. However, the private sector is not well positioned to engage in right-of-way procurement or environmental review. The report discusses the pros and cons.

The report concludes that clear state and regional policies are critical. When states or regions have well-defined policies, such as the need to sustain a regional roadway system, it is possible to weave tolling and partnerships into a regional vision. This vision then leads to discussing public–private partnerships and toll options in long-range and corridor planning and thinking strategically about where these options may provide the most public benefit. It is important for public and private sectors to realistically assess which potential highway projects are feasible for a nontraditional approach. There is no single way to approach a partnership or tolling project; whatever approach is used, it must be flexible.

CONTENTS

ACRONYMS AND ABBREVIATIONS

ATCs	alternative technical concepts
AASHTO	American Association of State Highway and Transportation Officials
BOO	build–own–operate
BOT	build–operate–transfer
Caltrans	California Department of Transportation
CPTC	California Private Transportation Company
CTV	California Transportation Ventures, Inc.
CE	categorical exclusion
CEQ	Council for Environmental Quality
DBF	design–build–finance
DBFOM	design–build–finance–operate–maintain
DBOM	design–build–operate–maintain
DEIS	draft environmental impact statement
DOTs	departments of transportation
EIS	environmental impact statement
EPA	Environmental Protection Agency
FDOT	Florida Department of Transportation
FEIS	final environmental impact statement
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FONSI	finding of no significant impact
GDOT	Georgia Department of Transportation
HOT lanes	high-occupancy toll lanes
LEDPA	least environmentally damaging practicable alternative
LRP	long-range plan
LRTP	long-range transportation plan
MAG	Maricopa Association of Governments
MLSP	Atlanta Regional Managed Lane System Plan
MPO	metropolitan planning organization
MTP	metropolitan transportation plan
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NCTCOG	North Central Texas Council of Governments
OTP3	Commonwealth of Virginia Office of Transportation Public–Private Partnerships
P3	public–private partnership
PAB	private activity bonds
PDA	predevelopment agreement
PPP	public–private partnership
PPTA	Commonwealth of Virginia Public–Private Transportation Act
PSC	public-sector comparator

ROD	record of decision
SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SANDAG	San Diego Association of Governments
SDELP	San Diego Expressway Limited Partnership
SEP-15	Special Experimental Project 15
SHRP 2	Second Strategic Highway Research Program
SIP	state implementation plan
SRC	selection recommendation committee
STIP	state transportation improvement program
TCAPP	Transportation for Communities—Advancing Projects through Partnerships
TEA-21	Transportation Equity Act for the 21st Century
TIFIA	Transportation Innovation Finance Innovation Act
TIP	transportation improvement program
TPB	National Capital Region Transportation Planning Board
TRIP II	Toll Road Investors Partnership II
TxDOT	Texas Department of Transportation
U.S. DOT	United States Department of Transportation
VDOT	Virginia Department of Transportation
VfM	value for money
WSDOT	Washington State Department of Transportation

Executive Summary

Overview

This study has been conducted as part of the Capacity Focus Area of the Second Strategic Highway Research Program (SHRP 2), which involves 22 different research efforts exploring how environmental, economic, and community issues can be integrated into the analysis, planning, and design of new highway capacity. The centerpiece is the Decision Guide, a four-phased structure of key decisions common to the development of all transportation projects through the completion of planning and National Environmental Policy Act (NEPA) processes. The guide focuses on the principal areas of development: long-range planning, programming, corridor planning, and environmental review/permitting.

The specific purpose of the SHRP 2 C12 project, Effect of Public–Private Partnerships and Nontraditional Procurement Processes on Highway Planning, Environmental Review, and Collaborative Decision Making, is to assess the interplay between the use of public–private partnerships (defined as P3s in this report) and transportation and environmental planning processes to identify whether P3s should be considered as a means to procure transportation improvements—and how and when they should be considered. The framework of the established Decision Guide is considered throughout this process, with special attention given to how P3 procurements interface and influence the process. (For a glossary of relevant terms, see Appendix A.)

The SHRP 2 Project C12 research is based on extensive interviews conducted with state transportation department and metropolitan planning organization (MPO) officials and private investors with hands-on experience of P3 project implementation. Study research is also based on review of relevant government laws and regulations and pertinent secondary source materials. (For a literature review and additional P3 resources, please see Appendix B.)

Key Findings

The research has revealed the following key findings:

- The nature of highway P3 projects in the United States has evolved from smaller projects initiated at the local level into much larger, higher-priority, and highly visible projects.
- The National Environmental Policy Act (NEPA) process is linear and involves a series of one-time decisions. This differs from the cyclical nature of the planning process.
- The dichotomy between the NEPA and the planning processes can cause delay in finalizing NEPA actions, because final designs emerging from NEPA analyses must be incorporated within MPO documents before projects may gain environmental clearance.
- Private development partners prefer to avoid the uncertainties of gaining NEPA approvals, and therefore they increasingly pursue P3 procurements for projects that have already attained environmental clearance.

- Private-sector innovation can be inhibited for projects that have gained environmental clearance resulting from risks and delays associated with reopening the NEPA process when approved designs are revisited.
- The decision to procure projects on a P3 basis may be made at any point during the planning and NEPA processes, which can, in many cases, lead to the decision being made only after completion of NEPA.
- There is an important distinction between a definitive decision to procure a project on a P3 basis and whether to advance the project as a P3.
- Possible use of P3 procurement should be considered as early as possible in the planning and NEPA processes, and then the Decision Guide process should be used to vet that possibility.
- There are steps that may be taken to facilitate the consideration of P3 procurements within the existing planning and environmental review processes, which are largely fixed and codified, including
  - Introduction of tolling and alternative funding, together with the possibility of P3 procurements, during NEPA and the state and regional planning processes;
  - Alignment of project definition with revenue potential and available funding; and
  - Management of NEPA and other strategies to afford greater flexibility and speed.

P3 Options and Trends

P3s are contractual agreements between public agencies and private entities that allow for greater private-sector responsibility in the design, delivery, financing, operation, and maintenance of transportation improvements beyond traditional design–bid–build procurements. The degree to which the private sector assumes responsibility, including financial risk, differs from project to project.

P3 options range from design–build procurements, where design and construction services are bundled in a single, fixed-price agreement. The terms can include concessions, where the private investor/operator is responsible for financing, designing, constructing, operating, and maintaining new highway projects in exchange for the right to collect toll proceeds or receive periodic availability payments for the duration of a concession period.

The number of P3 transportation projects in the United States is small. The earliest P3 projects tended to be smaller, with construction values of $30 to $350 million, and often were initiated by local regions that sought to implement projects that were not necessarily viewed as having the same priority by state departments of transportation (DOTs). Other projects were identified and initiated by private firms interested in providing access to new developments, projects that did not necessarily provide immediate congestion relief. A majority of these projects ended in bankruptcy and have been taken over by the state.

Despite the mixed outcomes for the first P3 projects in the U.S. highway sector, eight new P3 projects were in construction as this research concluded, and many potential P3 projects are under study. With an average construction value of over $1.6 billion, this newer group of P3 projects represents a marked departure from the earlier P3 activity: in addition to being larger, these projects have received significant public subsidies to make them bankable. Increasingly, the public-sector sponsors of these initiatives have become responsible for project definition and environmental clearance, with the introduction of private-sector participation occurring only after a project has been cleared to enter final design phase.

Legal Issues with P3s

The implementation of P3 projects raises several legal and financial issues that are uncommon in traditional public-sector procurements. P3 implementation is largely driven by statutory and regulatory frameworks that have been established by federal and state governments. To consider the implications and interaction of the P3 process with those in the Decision Guide requires a

concrete understanding of relevant legal issues. Furthermore, federally mandated transportation planning requirements for state DOTs and MPOs play a central role in how and when P3 projects are considered. Before a P3 alternative can be seriously considered as part of the project planning and environmental review processes, the overseeing public owner must have the authority to procure and implement P3 projects. This essential authority involves seven key legal concepts that are critical to the ultimate success of P3 procurement:

1. Permission to rely on reduced/alternative payment and performance security;
2. Authority to bundle design, construction, operation, maintenance, and other services into a single procurement;
3. For predevelopment agreement projects, the ability to contract with a private entity to assist the public owner in defining a feasible project and, if the project is deemed feasible, to negotiate an agreement to implement the project;
4. For toll projects, tolling and toll enforcement authority and the authority to compensate a private entity for losses it incurs that are directly due to the construction of previous unplanned competing facilities;
5. For availability payment projects, authority to obligate funding for multiple years;
6. Authority to use funding and financing from any available and lawful source; and
7. Authority for a private entity to receive a return on its investment.

Planning requirements for all transportation projects that include P3s coincide with the first two phases of the Decision Guide: long-range planning and programming. Federal law requires states and metropolitan regions to develop and update long-range transportation plans that address needs and policy over a 20-year period. Federal law also requires the development of nearer-term transportation improvement programs (TIPs), identifying which projects in a long-range plan are to be completed within an upcoming 4-year cycle. Each of these planning documents must be fiscally constrained, meaning that assumed funding sources must be "reasonably expected to be available."

These requirements have typically inhibited the consideration of P3 procurements as part of the planning process because the availability of funding sources used to support these projects (including toll proceeds or a private-sector equity contribution) is not sufficiently well known in advance of project development. However, 2009 guidance jointly issued by the Federal Highway Administration (FHWA) and the Federal Transit Association (FTA) clarifies that toll revenue sources associated with financing a P3 project may be "reasonably expected to be available." In addition, P3 procurement may be considered "reasonable" if the state or region has a history of successful P3 implementation and if enabling legislation is in place or if efforts are under way to enact enabling legislation and there is evidence of support by a governor and/or legislature.

Common Challenges with P3 Projects

In addition to the need for enabling legislation, P3 project implementation raises other challenges for public-sector sponsors. The development of P3 projects is time intensive and complex, requiring areas of expertise beyond that of most public-sector transportation agencies. Many of these implementation activities take place outside the planning and NEPA processes and require fundamental cultural changes in how public agencies conduct business. Some of these less-familiar areas of expertise in P3 procurement include

- Financial feasibility assessments;
- Financial modeling;
- Preparation of detailed investment-grade toll revenue forecasts;
- Risk transfer analysis;
- Preparation of long-term life-cycle maintenance and operations cost forecasts;

- Public-sector comparator analysis;
- Toll collection and back-office accounting procedures; and
- Legal and contractual issues that are associated with long-term concession agreements lasting 30 to 50 years or more.

Private partners also have to coordinate with lenders, rating agencies, equity partners, technical advisors, and subcontractors, as well as with DOTs. The operational situation of these private partners is often much more complex than what public-sector sponsors may readily appreciate.

There is also a need for greater coordination between the NEPA and planning processes to avoid costly delays that arise from the inherently different nature of the two processes. NEPA involves a series of fixed milestones as projects advance, each of which is a one-time event. However, the MPO process is updated cyclically in 4- to 5-year increments, which may cause delays if the project scope changes and the planning documents must be revised between cycles. Even though delays are not generally monetized by public-sector project sponsors, "time is money" to private project developers who operate with fixed time frames for project implementation and to derive return on investment. This is the primary reason all private-sector P3 practitioners interviewed stated that they prefer to participate in P3 procurements after the conclusion of NEPA.

P3 projects transfer two of the most visible public service functions to the private sector: the building and operating of transportation improvements. Such visibility is often heightened because P3 procurements are often used on large, complex, and high-profile projects where tolling will be imposed. These dynamics inevitably raise concerns among the public, which is likely concerned with the use of tolling, the differing motivations for project sponsors and their private partners to collaborate, and the perception that P3 procurements may lead to predetermined outcomes.

Agencies sponsoring P3 projects should anticipate addressing these types of concerns and be prepared to promote the many sound arguments for the use of P3 procurement. Agencies should respond clearly to concerns in discussion to support public understanding of the benefits of P3 procurement, including

- Accelerated project implementation;
- Access to new sources of equity and finance;
- Enabling public transportation funding to be used on other needs; and
- Reduced life-cycle costs (capital construction, ongoing maintenance, and operations costs) as compared with those associated with traditional public procurement.

Traditionally, the NEPA process has done an excellent job of identifying anticipated project impacts, but it should also identify the benefits of projects. This extends to tolling, which is often the linchpin that allows projects to advance; in many cases, such dedicated revenue source projects would not otherwise advance. Therefore, if the P3 sponsor can clearly present a rational explanation for a project from the inception of the project development process, public support is more likely to be gained.

The Timing of P3 Procurements

It is essential to understand both when and how P3 procurement should be considered as a project develops. Addressing these considerations is the crux of the research conducted in SHRP 2 Project C12.

An underlying premise of the Decision Guide is that the transportation planning and environmental review processes can be parsed into discrete decision points. Initially, the research envisioned for a project was conducted with the expectation of examining and adapting these decision points for P3s. However, as the research progressed, it was revealed that the ability to ascertain the precise juncture at which the decision was made to implement a project on a P3 basis was less significant than determining the extent to which deliberate consideration was given to P3 delivery and where that consideration occurred within Decision Guide processes.

The decision to procure a project on a P3 basis may be made any time during the Decision Guide processes or after the completion of NEPA. As the SHRP 2 research team has determined, projects involving early consideration stand the greatest chance for success. Similarly, assessing a set of projects on a programmatic basis may reveal the best project candidates for P3 implementation. Still, "success" is a malleable concept in these cases. In some cases, reaching financial close may define success in the short term; in other cases, success may be based on either the public or the private partner's viewpoint. Project success for the public sector might be measured by the ability to have delivered the project sooner than anticipated without a P3 or by the ability to implement additional projects with funds not spent on the P3 project. A private partner is likely to measure success by return on investment or by the ability to secure future work.

Procuring P3 Projects Before Concluding NEPA

The primary advantage of a decision to implement a project as a P3 before final NEPA approval is to encourage private-sector innovation, because the ability of a private partner to play a role in the definition of alternatives, and ultimately a preferred alternative, can ensure that the partner's design, constructability, and facility operations expertise are incorporated. The timing of this decision is likely to yield a better project outcome than would be produced by the public sector independently. It can be anticipated that a private partner can bring business experience from working in a diverse set of project environments and can approach project details from a life-cycle costs standpoint. The advantages that can be offered by private partners can help optimize alternatives development, which are similar to a value engineering exercise.

There is also a downside to early private-sector involvement in the development of projects before completing NEPA analysis: a reduced field of interested participants means less competition. This can generally lead to fewer competing proposals, fewer cost comparisons, and a smaller number of alternative technical concepts. There is also concern regarding the impartiality of the NEPA process and the possibility (perceived or otherwise) of private-sector influence over the selection of a preferred alternative. As a result, project sponsors must weigh the trade-offs between fostering an environment for innovation before the conclusion of NEPA and potentially restricting the number of parties willing to participate in that process.

Procuring P3 Projects Following NEPA

One of the greatest unknowns in implementing transportation improvements is the time frame for obtaining environmental approvals. These unpredictable factors are varied: project scopes can change, litigation may arise, and sponsors must coordinate with many different stakeholders. The possibility of incurring extensive delays is greatest during implementation, and any of these occurrences can adversely affect budgets resulting from cost escalation. These risks can be greatly reduced by waiting until the conclusion of NEPA to procure P3 projects. The competitive environment is also significant when conducting a P3 procurement post-NEPA, when public sponsors have a greater field from which to select a best-value proposal and can capitalize on competition to drive down cost and potentially promote technical innovation.

Although the prospect of a competitive environment increases when soliciting a P3 after environmental clearance, this scenario is counterbalanced by a reduction in the ability to capitalize on private-sector innovation. When private partners become involved in project development late in the NEPA process, many opportunities to refine the design or scope of projects may become limited, and opportunities can become even more limited if the environmental review process has already been completed. A private partner's willingness to offer an alternative technical concept may also depend on how the risk of additional environmental analysis is to be allocated. Private partners may be more encouraged to propose alternative technical concepts if the public sector is willing to accept the risks. In this case, the public sector has a higher tolerance for accepting the risk of reevaluation compared with private developers because it does not operate within the same

financial confines. Private-sector partners must operate within a time-constrained environment when arranging project financing and must consider the low tolerance for long project gestation periods and delays that occur from reevaluation.

The need to address public acceptance of P3 procurements as they are advanced after the opportunity costs of committing excessive resources to a single project is important. There are also potential implications of public acceptance of P3 procurements when they are advanced after the completion of NEPA. Ongoing public outreach and awareness-building is necessary to garner support for private-sector involvement concerning the delivery of transportation improvements and any use of tolling. The window of opportunity to nurture this process becomes more limited when P3 procurements occur after completion of NEPA analysis, because the NEPA process itself sets the framework for public expectations about configuration of any facilities to be built and how they will be operated. If a decision is made post-NEPA to toll a project or use P3 delivery, the ability to overcome public skepticism or outright disapproval is all the more challenging.

Strategies to Encourage the Consideration of P3 Procurements

The SHRP 2 C12 research concludes with interpreting the findings of the study to identify steps that may be taken to incorporate the consideration of P3 procurements within the existing planning and environmental review processes, which are largely fixed and codified. The resulting research from the study has identified numerous strategies that may be pursued.

Incorporating Tolling and P3s in State and Regional Planning

The revenue sources included in most long-range plans reflect current transportation funding patterns in the United States and rely on relatively conservative assumptions to achieve a level of certainty and predictability. The use of P3 procurements is rarely considered in long-range planning because P3 projects with standalone financing require their own dedicated revenue sources. These dedicated revenue sources and the associated financing tools are not known with great certainty until much later in the project development process and often not until an agreement has already been reached with a private partner and project financing is under way. Nonetheless, P3s can be a better integrated and more viable option for project delivery if revenue sources most commonly associated with P3s (including tolls) are considered systematically during the planning process.

Although there are many factors inhibiting the consideration of tolling, a primary purpose of long-range planning is to establish regional transportation goals and policies to direct future project development. These activities are mutually supportive: the long-range planning process can develop regional policies that support tolling and P3 development, and regional policies can help guide future transportation planning to better incorporate the financial considerations of toll roads and P3 development.

One method that can be used to facilitate the consideration of P3s and tolling during the planning process is the development of regional or state policies that encourage such consideration. This development approach allows the public sector to achieve the following three objectives:

- Establish a framework for public education and debate to help raise the level of understanding for transportation needs and those that can be met with P3s.
- Establish a precedent for P3 consideration to build the evidence needed to support fiscal constraint with toll or P3-related revenue.
- Shape a planning process that can help narrow the range of feasible alternatives considered during NEPA to those that require support from tolls or other nontraditional funding sources in addition to including such information in a purpose and need statement.

The North Central Texas Council of Governments (NCTCOG), the MPO in the Dallas–Fort Worth region, provides a prime example of an agency that has adopted a regional policy on tolling to help accomplish the three objectives, as identified. It should be noted that NCTCOG's regional toll policy is not intended to dictate the application or even to mandate consideration of P3s but rather to recognize the reality that traditional transportation funding available to the region is insufficient to meet mobility needs.

Incorporating Tolling and Alternative Funding in NEPA

Consideration of tolling and other alternative funding sources that could be used to finance a P3 should continue into the NEPA process on a project-specific basis. Indeed, inclusion of these funding sources into statements of purpose and need and subsequent alternatives analyses is both permitted and encouraged through federal regulation and guidance that link the planning and environmental review processes. There are significant advantages to doing so because such inclusion increases public awareness and anticipates potential issues that are germane to tolled and P3 projects.

Alternative funding sources, such as tolls, are critical to successful private-sector involvement in a P3. Carrying the consideration of these sources forward from long-range planning into the NEPA process positions a public sponsor to make a decision on project procurement on a P3 basis at a juncture that a sponsor deems most appropriate. In this manner, project financing, including that from a private-sector source, can be evaluated among the alternatives considered within a NEPA document.

If the long-range planning process confirms that a highway improvement can only be built with a tolling system, alternatives without tolls or the provision for alternative funding sources do not need to be considered in the NEPA analysis. Even so, the federal guidance cautions against the potential public challenges faced with proposing a toll road and states that examination of nontoll alternatives may be advisable to avoid future litigation.

Despite federal regulatory provisions concerning incorporation of tolls and private financing into projects' purpose and need and NEPA alternatives, there has been limited experience in practice to judge the success of a systematic application of this strategy.

Aligning Project Definition with Revenue Potential and Available Funding

One of the most important findings to emerge from SHRP 2 research is the need to identify and address challenges posed by funding gaps early and to then use the Decision Guide processes to vet different options available to enable project advancement. This approach is more commonly in use within the public toll road sector, where revenue potential is assessed at the onset of the planning process and involves the forecast of future cash flows and determination of what level of debt can be supported. Once these determinations have been made, project design can be developed that adheres to future revenue streams or, in cases where such is not a component, the additional level of public subsidy needed can be identified to move into implementation. Private investors also use this same general approach when assessing whether to pursue potential P3 opportunities.

Although the preparation of financial plans would be helpful in mobilizing project sponsor determination of whether different alternatives are actually affordable, project-specific cash flow models and financial plans are not required as part of the NEPA or planning processes. FHWA, however, does require that financial plans be prepared for all highway improvements receiving federal funding with implementation costs over $500 million. Although FHWA recommends preparation of an initial financial plan as early in the project development process as practical, it generally expects to receive an initial version of the plan either at the time a ROD is issued or before right-of-way acquisition.

If project sponsors perform cash flow assessments for large and complex projects earlier in the project development process, they are able to determine sooner whether funding gaps exist. If this determination is made while projects are still in NEPA, then additional alternatives to reduce capital costs or to generate new revenues through tolling could also be assessed. Similarly, this type of analysis would help DOTs determine if particular projects have the potential to be financed largely through toll revenues, and it would also enable DOTs to readily identify projects with the potential to be developed on a P3 basis.

Managing NEPA to Afford Greater Speed and Flexibility

Although there is the risk of delay during the NEPA planning stage, such risk can be well managed and controlled with proactive planning at the onset of project development.

Identifying Data Needs Up Front

A great deal of up-front data gathering is required for an environmental evaluation. With potential P3 projects, that information collection process should be expanded to include the additional data sets that will be needed to assess future P3 potential and is critical to ensure that the data emerging from the environmental review process are consistent and suitable for use in various analyses. This is particularly true with traffic data, which are used to assess environmental impacts, as well as with revenue generation estimates and the applicability of different toll rates to achieve desired operational and revenue generation goals.

Study Areas in Environmental Documents

In certain situations, expanding study areas in environmental documents may reduce schedule delays and enable greater design flexibility both during NEPA and afterward. This is particularly true for interchange locations, because their cost is often quite high and can vary substantially depending on their configuration. In addition, introduction of tolls frequently necessitates operational improvements at interchanges. As a result, P3 partners often focus value engineering efforts on strategies to reconfigure interchanges to reduce construction costs and improve operational characteristics.

If the analysis envelopes around interchange locations are not large enough to accommodate the review of different design options, additional data may be needed, which may precipitate schedule delays. This data gap can be avoided if the data are collected early on in NEPA analysis. Comprehensive baseline data are also helpful to private developers in their effort to develop alternative designs to avoid sensitive areas such as wetlands. Such alternative design plans can serve to limit any need for reevaluation.

Determining the Appropriate Level of Design During NEPA

The level of design performed during NEPA is another factor to consider when agencies are contemplating procuring projects on a P3 basis. A balance must be struck between the need to reach a level of design that allows the project's impact to be properly considered and mitigated in a final environmental impact statement (EIS) and the desire to maximize the flexibility of a private partner to innovate during final design.

In most cases, the level of design required to complete the NEPA process represents about 30% of the total project design. Though such designs lack detail, their importance should not be underestimated, because the design will specify the location and general project concept, both of which are often critical to the ultimate financial success of a P3 project. In environmentally sensitive areas, 70% of design may be completed to address potential impacts up front.

If the P3 procurement occurs after NEPA's completion, the sponsoring agency may wish to consider completing less than 30% of the design to allow greater opportunity for the private sector to define the physical and operational characteristics of the project in a manner that capitalizes on its design and operational expertise.

A Vision for Enhancing the Decision Guide Process to Consider the Potential for P3 Development

Even though an increasingly large proportion of P3 procurements move forward after project sponsors have gained environmental clearance for projects, the research reveals that several states and regions are considering the possible use of tolling and P3s early on in the Decision Guide process and are using both planning and NEPA processes as a platform to vet these possibilities. In some cases, regions and states conduct their own feasibility assessments of projects in the early stages of conceptual development to identify viable candidates for P3 development and then adapt NEPA review data to assess tolled alternatives.

The research also demonstrates that state and regional policies are especially effective in encouraging or even requiring the consideration of tolling and P3 development. When regions have well-defined policies, such as the need to sustain a regional roadway system, it is possible to weave tolling and P3s into a regional vision. This has led the NCTCOG to identify $6 billion worth of priced projects in the 2035 Metropolitan Transportation Plan (MTP) for the Dallas–Fort Worth Metroplex. As NCTCOG officials note, "If these roads are not tolled, they will not be built . . . it is hard for NCTCOG to think differently."

In P3 assessment and planning, flexibility is essential, as is first developing an understanding of which projects may be feasible for P3 development. To do so, project sponsors must prepare forecasts to ascertain the revenue generation potential of projects if they are tolled, as well as the value for money assessments that include the calculation of life-cycle costs and a public-sector comparator analysis to identify the cost of the project's implementation and maintenance on a public basis. These analyses should be prepared concurrently with the Decision Guide and be used to inform key decisions, including whether projects will be tolled; whether tolls will be implemented on a P3 basis; what detail about any type and term of concession is to be used; and what amount of public subsidy may be needed.

The planning process should explore the possible use of tolling and P3 procurements from a regional policy perspective and should engage all stakeholders to determine the level of support for these options. Once candidate projects have been identified through the analyses as described, the environmental review process should compare the possible use of tolling and P3 delivery to traditional public procurement. This analysis should provide clear information on the implementation time frames that can result by using different procurement and revenue options and by assessing the implications of those different time frames as part of the analyses. If these different possibilities are debated and assessed in MPO and NEPA analyses, decision makers and their stakeholders are better able to understand what is feasible and can use the Decision Guide as a platform to decide whether tolling and P3 development are appropriate for the local region. As many interviewees in the study observed, it is better to consider the possibility of P3 development during the Decision Guide processes and to decide not to go down a path than it is to defer the decision to the end of the process and then be forced to go back to the beginning.

CHAPTER 1

Introduction and Orientation

Overview

The primary goals of the SHRP 2 Capacity focus area include promoting best practices and encouraging innovation and collaboration throughout transportation decision making and project development processes. Therefore, the Transportation for Communities—Advancing Projects through Partnerships (TCAPP) initiative has established the Decision Guide, which is a four-phased structure of key decisions common to the development of all transportation projects through the completion of the environmental review process that typically culminates in a record of decision (ROD) or finding of no significant impact (FONSI). TCAPP is now known as PlanWorks. (For a glossary of relevant terms, see Appendix A.)

Problem Statement

The specific purpose of this research study was to assess the interplay between the use of public–private partnerships (P3s) and transportation and environmental planning processes to identify whether P3s should be considered as a means to procure transportation improvements and how and when they should be considered. The framework of the established Decision Guide was considered throughout this process, with special attention paid to how P3 procurements interface with and influence it. The research for SHRP 2 C12 was conducted from the perspective of two outcomes:

- The primary product of the research is a report on the nature, timing, and implementation of P3 projects. Experience in the United States demonstrates that there is a great deal of flexibility in the use of P3 strategies, and the report explores the different points in the overall project development process when private involvement can be introduced.
- The second aspect of the research involved identifying points in the Decision Guide when it is beneficial to consider the use of P3s in developing projects and ultimately mapping the findings on the implementation of P3 projects to the various steps in the Decision Guide. The report also explores other types of nontraditional contracting arrangements and their effect on the project development process as set forth in the Decision Guide.

Although this project envisioned a discussion of funding mechanisms other than P3s, the research found that except for P3 projects, the NEPA process does not differ for public toll projects or other public projects funded in nontraditional ways. The type of funding a project uses does not change the transportation planning and NEPA processes. Rather, it is the parties to the process that lead to a different dynamic. For example, a private participant is typically driven by financial pressures to be more concerned about implementation time and certainty of outcome. The complexity of the typical P3 transaction also has implications for project timing and decision making. Finally, the range of P3 projects includes many of the nontraditional funding sources that could also be used by states without private-sector involvement. Thus, to some extent, these matters are covered by the discussion of P3s. (For a literature review and additional P3 resources, please see Appendix B.)

P3s: Current Context

In the United States, the private sector historically has played an important role in highway construction operation and financing through the mid-part of the 19th century. Although privately financed motorways are common in countries around the world, they have not generally been favored in the United States. There are two primary "drivers" behind this trend: the prohibition of tolling on the interstate highway system introduced in the 1956 Interstate Highway Act (with the exception of legacy toll facilities) and the municipal debt market, which enables public agencies to obtain cheaper, tax-exempt debt compared with commercial credit markets that are available to private investors.

However, beginning in the 1990s, a small number of privately financed design–build–finance–operate–maintain (DBFOM)

toll roads began to be built in the United States, due in part to the added financing flexibility provided by the Intermodal Surface Transportation Efficiency Act of 1991. This act allows federal funds to be used to support the construction of new noninterstate toll highway, bridges, and tunnels. This act also allows the use of congestion pricing on designated highway lanes, including those on the interstate system on a demonstration basis.

As shown in Table 1.1, as of October 2012, 11 highway projects with a combined construction value of over $2.7 billion have been developed through P3 concessions or on strictly private bases. An additional eight P3 toll facility concessions are currently under construction, representing a collective investment of over $13.1 billion. This demonstrates that P3 procurement has indeed accelerated over the past 5 years and is now being used to deliver larger and more complex projects. In addition to the projects included in the table, five publicly procured toll facilities have been leased to private investors, providing the public sponsors with over $8.3 billion in private money.

As state governments continue to face budget gaps and revenue shortfalls, their interest in tolling and use of P3 procurement to deliver highway improvements continues to grow. As the research concluded, 32 states and Puerto Rico

Table 1.1. U.S. P3 Highway Projects in Operation and in Construction, as of October 2012

	Project	State	Type	Location	Value (millions)	Distance (miles)
Operating P3 Projects						
1	Alabama River Parkway	Ala.	New private toll road	Montgomery County	$12	5.8
2	Black Warrior Parkway	Ala.	New private toll road	Tuscaloosa County	$25	6.4
3	Emerald Mountain Expressway Bridge	Ala.	Private toll bridge	Montgomery County	$4	2.4
4	Foley Beach Expressway	Ala.	New toll highway	Foley	$44	13.5
5	SR 91 Express Lanes[a]	Calif.	New priced managed lanes	Orange County	$130	10
6	South Bay Expressway[a]	Calif.	New toll highway	San Diego	$658	9.3
7	Camino Columbia[a]	Tex.	New toll highway	Laredo	$90	21.8
8	SH 130 Segments 5 and 6	Tex.	New four-lane toll highway	Austin	$1,328	40
9	Adams Avenue Parkway	Utah	New toll road and bridge	Ogden	$10	1
10	Dulles Greenway	Va.	New toll highway	Northern Virginia	$350	14
11	South Norfolk Jordan Bridge	Va.	New two lane high-level bridge with shoulders	Chesapeake	$100	1
				Total	$2,750	125.2
P3 Projects in Construction						
1	Presidio Parkway (Phase II)	Calif.	Six-lane roadway	San Francisco	$456	1.5
2	I-595 Express Corridor Improvements Project (595 Express)	Fla.	Three reversible HOT lanes	Fort Lauderdale	$1,834	10.5
3	Port of Miami Tunnel	Fla.	Subaqueous tunnel	Miami	$1,113	1
4	I-635 LBJ Managed Lanes (LBJ Express)	Tex.	Six new elevated managed lanes	Dallas	$2,615	13
5	North Tarrant Express	Tex.	Four new managed lanes, two general purpose lanes, four frontage road lanes	Dallas–Fort Worth	$2,043	13
6	I-495 Capital Beltway HOT Lanes (495 Express Lanes)	Va.	New four-lane HOT facility in median	Northern Virginia	$2,068	14
7	I-95 Express Lanes	Va.	New two- and three-lane reversible HOT facility in median	Northern Virginia	$938	29.4
8	Downtown Tunnel/Midtown Tunnel/ MLK Extension	Va.	New tolled tunnel and related improvements	Norfolk/Portsmouth	$2,089	2.5
				Total	$13,156	84.9

[a] Sold to a public agency.

Source: Parsons Brinckerhoff, October 2012.

had enacted P3 authorization legislation, and several of these bills have been either enacted or expanded in the past 6 years (Rall 2012). Although the total number of P3 projects remains just fraction of overall investment in highway infrastructure in the United States, their number is likely to increase.

Overview of the TCAPP Decision Guide

The SHRP 2 Capacity focus area is underpinned by the SHRP 2 Project C01, A Framework for Collaborative Decision Making on Additions to Highway Capacity. TCAPP established a collaborative decision-making framework that is associated with planning and gaining environmental approvals for transportation projects. Now known as the PlanWorks Decision Guide, this framework was designed to enhance collaboration in decision making for highway capacity expansion projects.

The Decision Guide identifies the following four phases associated with the transportation planning and environmental review processes:

1. Long-range planning. This phase establishes the foundation that is made throughout the decision-making process, effectively connecting planning to project implementation. Stronger public understanding is one of the key benefits to this approach.
2. Programming. The Decision Guide aims to create a programming process that both informs and is consistent with long-range planning.
3. Corridor planning. Corridor planning draws appropriate data, analysis, and decisions from the long-range planning phase and provides a finer scale of consideration to support environmental review under the National Environmental Policy Act (NEPA).
4. Environmental review/permitting. The Decision Guide connects the procedural steps of NEPA, other environmental statutes, and permitting to the decisions that are made in long-range planning, corridor planning, and programming.

Within the four-phase structure, the Decision Guide lays out 44 individual decisions that must be made throughout development. Within each phase, the Decision Guide outlines the interests of all parties involved in the collaborative process, and within each specific decision, the guide considers questions that must be addressed to ensure that the collaboration covers each party's interests.

The Decision Guide also outlines several key external processes, such as P3 arrangements to be considered at key decision points in the development of transportation projects. See www.transportationforcommunities.com for further information.

Structure of the Report

The report is organized into seven chapters, including this introduction. Chapter 2 describes the different forms of P3 arrangements and recent developments in transportation partnership projects in the United States, as well as the attraction of P3 projects for both the public and private sectors. Chapter 3 presents the legal and regulatory issues associated with P3 project implementation, including those issues required by both planning and NEPA processes. The chapter also discusses the financing options available with P3 procurements and their influence on the use of different P3 models. Chapter 4 discusses the many challenges associated with implementing P3 projects, from obtaining enabling legislation to fielding the new responsibilities P3 projects introduce to sponsoring agencies to coordinating projects with both planning and NEPA processes. Chapter 4 also includes a discussion of the impediments to public acceptance that can be expected with P3 projects, along with a presentation of strategies to overcome impediments.

Chapter 5 introduces a key distinction made during the research effort and focuses on the difference between making a decision to procure a project on a P3 basis and the consideration of P3 delivery as an option for moving transportation infrastructure projects forward. The chapter also presents discussion of the study's finding that it is best to consider the possible use of P3 procurement as early as possible in the TCAPP process, and to use the Decision Guide process to vet that possibility. This is followed by discussions of P3 procurements before or during NEPA and decisions to use P3 delivery after NEPA completion, including respective advantages and disadvantages.

Chapter 6 interprets the research findings to suggest a series of strategies for facilitating and encouraging the early consideration of P3 project delivery. These include

- Incorporating tolling in the state and regional planning processes;
- Including the assessment of tolled alternatives in NEPA analyses;
- Aligning the definition of highway projects during NEPA reviews with their potential to generate toll revenues and any other funding available for their implementation; and
- Managing the NEPA process to afford greater flexibility for innovation once it has been completed.

Chapter 6 concludes by setting forth a vision for incorporating these strategies in the Decision Guide process. Chapter 7, which is the final chapter, identifies specific recommendations for integrating the consideration of P3 delivery for highway improvements within the 44 steps that make up the Decision Guide.

CHAPTER 2

P3s: Definitions and Applications

This chapter summarizes the many forms of transportation P3s and also provides a brief history of P3s' evolutionary application in the United States. The chapter also reviews the motivations for and benefits of using a P3 approach to transportation project delivery, both from public-sector and private-sector perspectives.

P3 Definitions: A Spectrum of Delivery Options and Risk Transfer

The United States Department of Transportation (U.S. DOT) defines P3s as contractual agreements between public agencies and private entities that allow for greater private-sector participation and responsibility in the design, delivery, financing, operation, and maintenance of transportation improvements, as compared with the traditional design–bid–build process that involves public-sector financing, operations, and maintenance (FHWA 2012a). There are many different P3 models, and the degree to which the private sector assumes responsibility (including financial risk) differs from project to project. Transportation P3 arrangements range from design–build procurements (where design and construction services are grouped into a single, fixed-price procurement) to concessions (where a private investor/operator is responsible for financing, designing, constructing, operating, and maintaining new highway projects in exchange for the right to collect toll proceeds or to receive periodic availability payments for the duration of the concession period). In certain cases, P3 projects may involve transferring the operation of existing highway facilities to private-sector operators, who are also obligated to make capital improvements to the facilities.

Each of these P3 models has somewhat different implications on the interface between the planning and environmental approval processes and the development of P3 procurements. In addition, between public agencies and private industry interests, there are varying degrees of interpretation within this standard definition of what a P3 offers in terms of opportunity and value relative to a baseline project delivery model, typically design–bid–build. These interpretations are discussed further in this chapter under Improving the Characterization of P3s.

The rest of this section provides detailed information on different types of P3 arrangements used today in the United States. Many of the definitions and concepts presented are adapted from the FHWA Office of Innovative Program Delivery P3 website (FHWA 2012a) and the American Association of State Highway and Transportation Officials (AASHTO) Center for Excellence in Project Finance (AASHTO 2012).

Design–Build

Design–build is a project delivery method combining design and construction functions within a single contract, rather than as two independent services performed by separate contractors. Design–build procurements feature a single, fixed-fee contract for engineering services, as well as for construction. The design–build firm, also known as a constructor, may be a single entity or a joint venture among multiple firms. With design–build delivery, the design-builder assumes responsibility for completing a final design for projects and undertaking construction activities, as well as taking on the responsibility of risk associated with completing the work for a fixed fee. With design–build delivery, project sponsors finance and later operate and maintain the project, while the private-sector design-builder assumes a significant portion of the risk of construction cost overruns and often also schedule delays. Design–build delivery is often used on large and complex projects and also as part of other delivery models that are described in this section.

Design–build delivery offers numerous benefits to public agencies developing transportation improvements: one benefit is that it helps to accelerate completion because design and construction work can proceed concurrently. Opportunities for creative design solutions and the ability to align the project design with construction techniques and equipment also

provide the potential to accelerate implementation time frames and may result in overall cost savings. Shifting the risk of design defects to the private sector eliminates one of the most common causes of construction claims that create greater up-front cost certainty for the public sponsor.

Design–Build–Finance

Design–build–finance (DBF) is a P3 arrangement that uses private capital to accelerate the implementation of a project in advance of the availability of public funds that have been dedicated to a project. Essentially a variant of a design–build procurement, in DBF, the project constructor agrees to provide all or some of the construction financing to be repaid through either milestone or completion payments made by the project sponsor. These arrangements are typically short term and extend no longer than the duration of the construction period. Although DBF procurements transfer design and construction risk to the private partner, they do not transfer ongoing operating or maintenance risks and do not generate greater efficiencies than do design–build procurements. The primary benefit of DBF arrangements is that they provide project sponsors with short-term gap financing.

Design–Build–Operate–Maintain

The design–build–operate–maintain (DBOM) delivery model combines design and construction responsibilities with the ongoing operation and maintenance of highway facilities. These services are provided by a private-sector contractor through a single contract, with financing provided by the public sector. The advantage of DBOM procurement is that by combining these services, the private partner has an incentive to use cost-saving, life-cycle costing principles to align the design of the project with long-term maintenance activities. DBOM procurement is common in the transit sector and may also be used with highway improvements. It is also known by several other terms, including "turnkey procurement" and build–operate–transfer (BOT).

Design–Build–Finance–Operate–Maintain

With design–build–finance–operate–maintain (DBFOM) P3 arrangements, the private partner assumes responsibilities for designing, building, financing, and operating highway improvements for a designated time period. In exchange, the private-sector partner may have the right to collect all revenues generated by the project during the concession period, or the public sector may agree to make availability payments to the private-sector partner during the concession period, while retaining the right to collect toll revenues itself. There is a great variety in DBFOM structures and the degree to which financial responsibilities are actually transferred to the private sector; however, DBFOM projects are either partly or wholly financed by debt-backed project revenues. With DBFOM projects, future toll or availability payment revenues are used to secure bonds or other debt to raise capital for project development costs. With real toll concessions, project revenues are often supplemented by grants from project sponsors and other contributions, such as right-of-way or complementary construction projects.

Often referred to as the concession model, DBFOM contracts have concession periods that often extend for 30 to 50 years, and sometimes as long as 99 years. With DBFOM delivery, the project sponsor retains ownership of all project assets and establishes the maintenance standards and other improvements to be made over the concession period, such as the addition of new capacity. This ensures that the project is properly maintained and returned in good condition at the end of the concession period. DBFOM concessions are often attractive to public transportation agencies, because they can provide access to new sources of equity and financing and deliver similar schedule and cost-efficiency benefits as design–build and DBOM procurements.

DBFOM projects may be sponsored by numerous public agencies, including state DOTs and other state, regional, and local agencies. DBFOM projects may also be sponsored by public-benefit entities, which are able to issue tax-exempt debt on behalf of private project developers, pursuant to IRS Revenue Ruling 63-20.

Real Toll DBFOM Concessions

User fees in the form of tolls are the most common revenue source used to support P3 highway projects. Toll rates can be based on several variables, including distance traveled, vehicle class, number of trips, the time of day, vehicle occupancy, and congestion levels. P3 transactions using tolls as their primary revenue source are often referred to as "real toll projects."

The user-fee approach involves the risk that revenue levels will not meet expectations or forecasts, particularly with greenfield projects, which lack constraints imposed by previous projects. With publicly sponsored toll projects, the government assumes the revenue risks associated with tolling; however, with real toll P3 concessions, this risk is transferred to the private partner. If forecasts indicate that toll revenues will not be sufficient to cover the complete cost of financing, building, and operating a candidate P3 facility, the public sponsor may opt to provide a subsidy to the concessionaire to enable the project to be financed, particularly if the P3 procurement with private financing would result in additional cost and schedule efficiencies.

In the United States, most recent P3 projects, particularly those with high implementation costs, have been financed using a combination of toll revenues, government grants, private debt, and private investor equity. These transactions are often further enhanced by financial mechanisms, such as the Transportation Innovation Finance Innovation Act (TIFIA), and by private activity bonds (PABs). These federal tools encourage the use of toll financing and P3s by providing more favorable interest rates when compared with the private capital market. The TIFIA program also offers flexible repayment terms, and together these mechanisms help public agency sponsors of real toll projects and their private investment partners mitigate the risk associated with these transactions.

Four of the operating U.S. P3 highway projects identified in Table 1.1 have been implemented as real toll DBFOM concessions. They include

- Dulles Greenway (Northern Virginia): $350 million, 14 miles, opened 1993, 60 years.
- SR 91 Express Lanes (Orange County, California): $130 million, 10 miles, opened 1995, sold to public agency 2003.
- South Bay Expressway (San Diego): $658 million, 9.3 miles, opened 2007, sold to public agency 2011.
- SH 130 Segments 5 and 6 (Central Texas): $1.3 billion, 41 miles, opened 2012, 50 years.

Five of the eight P3 projects in construction as this research was being completed are real toll DBFOM concessions:

- LBJ Express (Dallas); $2.6 billion, 13 miles, opens 2015, 52 years.
- North Tarrant Express (Fort Worth): $2.0 billion, 13 miles, opens 2015, 52 years.
- I-495 Capital Beltway HOT Lanes (Northern Virginia): $2.1 billion, 14 miles, opens 2013, 75 years.
- I-95 Express Lanes (Northern Virginia): $938 million, 29.4 miles, opens 2015, 76 years.
- Downtown Tunnel/Midtown Tunnel/MLK Extension (Norfolk/Portsmouth, Virginia): $2.1 billion, 2.5 miles, opens 2017, 58 years.

Availability Payment DBFOM Concessions

Providing an alternative to real toll concessions, a small number of DBFOM P3 concessions in the United States have been or are being implemented using availability payments pledged by the project sponsor as their primary revenue source. Availability payments compensate private concessionaires for implementing and operating a tolled or nontolled roadway for a set time period. The payments are made by project sponsors based on milestones, such as completion of specified construction activities and later meeting operational performance standards, including lane closures, incident management, or snow removal. In the case of congestion pricing P3 projects, including high-occupancy toll (HOT) lanes, traffic level of service may be used as the primary performance metric.

Availability payments are often used for projects that are not tolled or for which project revenues are not expected to cover debt service costs. With availability payment models, the project sponsor retains the underlying revenue risk associated with developing the project, and the private partner receives a predictable, fixed set of payments throughout a concession period. Payments owing to the concessionaire may be secured by a revenue pledge or are subject to appropriations. Availability payment P3 concessions are also likely to involve private equity, federal credit assistance, and commercial debt.

With some availability payment contracts, the private partner receives no payments until construction is completed, whereas with others the private partner may receive milestone payments during the construction period. The frequency of the payments once projects are operational may vary and be subject to deductions, if the private partner does not maintain specified performance standards.

Availability payments have been used extensively in Canada, Europe, and Australia. In the United States, availability payment concessions are now being used for the first time on the following three projects (others are under consideration, for example, the East End Bridge near Louisville, Kentucky):

- Port of Miami Tunnel: $1.1 billion, 1 mile, opens 2014, 30-year concession.
- I-595 Express (Fort Lauderdale): $1.8 billion, 10.5 miles, opens 2014, 30-year concession.
- Presidio Parkway Phase II (San Francisco): $456 million, 1.5 miles, opens 2015, 30-year concession.

Asset Monetization Concessions

Asset monetization P3s involve the long-term lease of existing, publicly financed toll facilities to private-sector concessionaires for a prescribed concession period in exchange for an up-front payment and possibly an ongoing revenue sharing agreement. Under these arrangements, the private concessionaire has the right to collect tolls on the facility and is required to operate and maintain it to prescribed standards and, in some cases, make improvements. Much like the financing structure of DBFOM transactions, private investors raise financing for these sizeable fees by leveraging future toll proceeds that are generated by the leased facilities.

Long-term leases for asset monetization P3 projects are procured on a competitive basis, with awards based primarily

on the value of the up-front concession fee. Additional criteria may include the length of the concession period and the credit worthiness and professional qualifications of the bidders.

As the research was being completed, five asset monetization P3 concessions have been executed in the United States:

- Puerto Rico PR 22 and PR 5 lease: $1.436 billion, 40 years, 55 miles, awarded 2011.
- Northwest Parkway (Denver): $603 million, 99 years, 8 miles, awarded 2007.
- Pocahontas Parkway (Richmond): $610 million, 99 years, 8.8 miles, awarded 2006.
- Indiana Toll Road: $3.850 billion, 75 years, 157 miles, awarded 2006.
- Chicago Skyway: $1.83 billion, 99 years, 7.8 miles, awarded 2005.

Three of these transactions involved publicly financed, legacy toll facilities with a track record of generating significant toll revenues. The remaining two lease transactions involved financially troubled toll facilities that were headed toward bankruptcy. In cases where asset monetization P3 projects do not involve the development of new highway capacity, this P3 model is not germane to the Decision Guide process.

Build–Own–Operate

With this P3 model, all aspects of infrastructure development, including the outright ownership of facilities, lie with the private sector. Build–own–operate (BOO) projects are often implemented by real estate owners to provide access to new tracts of land they are developing. BOO projects tend to be smaller in scale than other P3 projects. Several of the projects identified in Table 1.1 have been implemented using the BOO model. They include (by project number)

1. Alabama River Parkway (Alabama): $12 million, 5.8 miles, opened 1998.
2. Black Warrior Parkway (Alabama): $25 million, 6.4 miles, opened 1998.
3. Emerald Mountain Expressway Bridge (Alabama): $4 million, 2.4 miles, opened 1994.
4. Foley Beach Expressway (Foley, Alabama): $44 million, 13.5 miles, opened 2000.
7. Camino Columbia (Laredo, Texas): $90 million, 22 miles, opened 2001.
9. Adams Avenue Parkway (Utah): $10 million, 1.0 mile, opened 2001.
11. South Norfolk Jordan Bridge (Norfolk, Virginia): $100 million, 1 mile, opened 2012.

Other Models for Private Participation

In addition to the P3 arrangements described, there are other models for private participation in the implementation of transportation improvements. They come primarily in the form of proffers, in which a private firm or individual, who stands to benefit from the development of an improvement, gives money, land, or other services to the project sponsor to help expedite the implementation of the project. Proffers often involve improvements to highway entrance and exit ramps that provide improved access to facilities or land owned by the donors or possibly the extension or expansion of an existing road.

Projects benefitting from proffers must go through the Decision Guide process, be included in fiscally constrained long- and short-range transportation plans, and gain any required environmental approvals. However, proffers may change the anticipated schedule for advancing the project into construction. If an agency receives a monetary offer or other contribution in kind for a project it is developing, it must weigh the benefits of receiving the private contribution and accelerating the implementation of the project against possible delays in implementing other improvements it had intended to advance. This scenario becomes an issue of project programming and prioritization, and the private party's offer may influence the public sector's decision on when to construct the project. It is up to the project sponsor and regional planning officials to weigh the pros and cons introduced by the proffer, and to decide whether it is in the region's best interest to accept the offer.

Washington State has taken an interesting alternative approach to P3 development resulting from several legislative requirements that make P3 highway development unrealistic. Instead, the Washington State Department of Transportation (WSDOT) is looking at nonhighway P3 opportunities, focusing primarily on policy initiatives. The largest proposal is the West Coast Green Highway, which involves the development of clean energy technology on the I-5 corridor in California, Oregon, Washington, and British Columbia.

WSDOT used $1 million in seed money to attract private developers to propose, finance, own, and operate a series of electric vehicle charging stations along the I-5 corridor. WSDOT received six proposals and awarded the contract to AeroVironment Inc., which is making a $1.6 million investment at their own risk. Interestingly, this project has been implemented outside the NEPA and planning processes, because WSDOT wanted to implement the project with the lowest level of approval possible and did not want to dictate where the charging stations would be located. Instead, the department established performance specifications and let the private partner identify locations for the charging stations.

The Evolution of U.S. P3 Highway Procurements

As shown in Table 1.1, the number of P3 projects operating or being advanced in the United States is small. Nonetheless, clear trends are evident among the types of projects being implemented on a P3 basis, as well as trends in the types of P3 models chosen for development. The earliest P3 projects tended to be smaller and often were initiated by local regions that sought to implement projects that were not necessarily viewed by state DOTs as having the same priority. There are also several early P3 projects that were identified and initiated by private firms that were interested in developing and operating them on a concession basis. Several early projects are now owned outright by their developers, who had initially implemented them on a BOO basis.

Early P3 Projects Yield Mixed Results

In 1988, Virginia became the first U.S. state to enact legislation allowing private companies to finance, build, and operate tolled highways. Shortly thereafter, the Toll Road Investors Partnership II (TRIP II)—composed of Shenandoah Greenway Corporation of Virginia, Italy's Autostrade per l'Italia, and the Texas-based engineering and construction firm Brown & Root—proposed to develop an extension of the Dulles Toll Road into Loudoun County as a private project (Perez 2004). In 1993, the Virginia Department of Transportation (VDOT) awarded the group a 40-year DBFOM concession to complete the 14-mile, $350 million four-lane highway linking the existing public toll facility with Leesburg in Loudoun County. Construction was completed 6 months ahead of schedule in September 1995, when the Dulles Greenway opened as the first P3 DBFOM concession to be built in the interstate highway era. Unfortunately, the new toll road suffered from disappointing financial results, with initial traffic daily traffic volumes of 8,000 vehicles rather than the forecasted 35,000. The concessionaire struggled to avoid bankruptcy for several years, despite toll rate adjustments. This instability was eventually rectified in 2001 by the state legislature, which lengthened TRIP II's concession by 20 years and enabled the company to extend the Greenway, further boosting use and revenue levels.

Several other early P3 projects have been less successful in avoiding financial collapse. The Camino Colombia in Texas is a $90 million truck bypass route providing access to the Mexican border. Sponsored by the city of Laredo, this P3 facility opened in 2000 and was sold at auction three years later for $12 million. It is now owned and operated by the Texas Department of Transportation (TxDOT). Similarly, the 16-mile, $240 million Southern Connector sponsored by the city of Greenville in South Carolina has faced revenue shortfalls since opening in 2001, because most drivers prefer to use a free interstate that passes through the center of town rather than the newer tolled route around Greenville's southern fringe. Actual traffic levels are approximately one-third of initial estimates. After refinancing negotiations with the state legislature failed, the public-benefit corporation sponsoring the project filed for bankruptcy in 2010, and the project's creditors may be facing losses (Samuel 2010).

In 1989, the California legislature approved the Assembly Bill 680 (AB 680) of July 1989, enabling the California Department of Transportation (Caltrans) to issue a request for statements of interest for up to four transportation projects to be financed by private investors under a demonstration program (Perez 2004). Investors were invited to identify projects they believed would be of greatest benefit to the state. Several consortia responded to Caltrans' request, and 13 groups were prequalified and invited to submit franchise proposals. Nine of the consortia submitted detailed proposals for eight different private toll road projects, and ultimately four groups were selected. Caltrans made its selection based on criteria that included the need for the project, environmental effects, constructability, right-of-way requirements, the experience of the consortium, incorporation of innovative concepts, and the promotion of economic development.

The following four projects were selected:

- SR-57: A 10-mile, $700 million extension of SR-57 in Orange County from Anaheim to I-405.
- Mid-State Corridor: An 85-mile, $1.2 billion toll road joining I-680 at the southeastern end of San Francisco Bay to I-80 near Vacaville, providing an alternative route to Sacramento.
- SR-125: A 9.3-mile, $660 million toll road in the southeast flank of San Diego connecting a Mexican border crossing with the regional freeway network.
- 91 Express Lanes: A 10-mile, four-lane, $130 million HOT lane facility in the median of a congested freeway connecting Orange and Riverside counties.

Of these, only the SR-125 (now known as the South Bay Expressway) and the 91 Express Lanes were built. Ironically, both of these facilities have since been purchased by the public sectors. The 91 Express Lanes opened to service in December 1995 as the second privately financed toll facility in the interstate era operated by the California Private Transportation Company (CPTC). CPTC was financially viable, but the company's concession agreement with Caltrans contained a noncompete clause, prohibiting the state from expanding nontolled highway capacity in the congested SR-91 corridor connecting Riverside and Orange counties. Ultimately, the need to expand

the freeway prompted the Orange County Transportation Authority to purchase the 91 Express Lanes from CPTC for $207.5 million in April 2002.

The South Bay Expressway reverted to public ownership for different reasons after filing for bankruptcy in 2010. This greenfield facility providing access to developing areas east of San Diego opened in 2007 at the same time that a recession brought commercial and residential growth in the corridor to a halt. Weak ridership and revenue levels were complicated by the cost of claims filed by the contractor against the project. In December 2011, the San Diego Association of Governments (SANDAG, the local MPO) agreed to purchase the $660 million facility at a cost of only $350 million.

The project was proposed by California Transportation Ventures, Inc. (CTV), an equal partnership among four private-sector firms. After 6 months of negotiation, Caltrans signed a development franchise agreement in January 1991 with a limited partnership company, San Diego Expressway Limited Partnership (SDELP), with CTV as its managing partner (Perez 2004). The project was fraught with challenges from its inception. SDELP had been required to gain environmental clearance for the project by December 1997 and to commence construction within the following 3 years. Several legal challenges soon emerged, including two lawsuits that resulted in a project hiatus for more than 2 years. During this time, Caltrans was also required to complete additional environmental studies as a result of the sighting of the endangered Quino checkerspot butterfly, with SDELP assuming the cost for the state's work, resulting in an additional 4-year delay. The project gained final environmental approval in mid-2000. It took SDELP an additional 3 years to reach financial close and to begin construction.

The outcomes of this initial cohort of P3 projects are decidedly mixed. Three of the 11 operating projects that were implemented on a P3 basis are now in public ownership and no longer operate as concessions. The 91 Express Lanes was purchased by the Orange County Transportation Authority because of its concession's noncompete clause. As described, the Camino Columbia and the South Bay Expressway were purchased by public agencies after their private developers entered bankruptcy as a result of weak toll revenues and other complications.

Of the eight facilities that are still privately operated as this research was being completed, six are smaller projects with capital costs ranging from $4 to $100 million owned outright by their developers on a BOO basis. The operator of the Greenville Southern Connector has declared bankruptcy and may be forced to sell that facility, which leaves the Dulles Greenway as the only financially healthy DBFOM toll concession in operation at this time. Located in five different states, together the 11 operating highway facilities implemented as DBFOM or BOO concessions represent over $2.7 billion in investment.

A Trend Toward Larger, High-Priority P3 Projects Defined by Owners

Despite the mixed outcomes of the first P3 projects in the U.S. highway sector, eight new P3 projects are in construction and many other potential P3 projects are under study or development. This newer group of P3 projects represents a marked departure from the earlier P3 activity in three important areas: size, use of public subsidies, and public-led project definition.

Larger Projects

With an average construction value of over $1.6 billion, these P3 projects are far larger than their earlier cohorts. Four of the eight projects being built have construction values in excess of $2 billion. The largest is the LBJ Express in Dallas, Texas, which has a capital cost in excess of $2.6 billion. Unlike the earlier P3 projects, which tended to be second tier priorities often supported by local regions rather than state DOTs, today's P3 projects are often of the highest priority to their sponsors. Many are projects on heavily traveled and congested corridors and have the potential to cover a large portion of their implementation costs with anticipated toll revenues; or they are high-priority needs projects to which sponsors are willing to commit future DOT revenues in the form of availability payments.

A Need for Public Subsidy

In addition to their size, today's P3 projects are notable because they are true partnerships, rather than ones for which private partner raise all project financing, as was the case with earlier projects such as the Dulles Greenway or South Bay Expressway. Instead, agencies sponsoring today's larger P3 projects commonly recognize that it is not feasible to implement DBFOM projects on a limited-recourse basis without public subsidies. This is true with the three projects under construction in Virginia (the $2.1 billion I-495 Capital Beltway HOT Lanes, the $938 million I-95 Express Lanes, and the $2.1 billion Downtown Tunnel/Midtown Tunnel/MLK Extension) and the $2.0 billion North Tarrant Express in Fort Worth, Texas. These projects have received sponsor subsidies ranging from $64 to $600 million to make them bankable.

Three of the DBFOM P3 projects in construction and one project in procurement are receiving a different type of public subsidy in the form of availability payments to be paid out over the duration of the concession period by the project sponsor. These are high-priority projects, such as the $456 million second phase of the $1.05 billion Presidio Parkway, a replacement of the southern access road to the Golden Gate Bridge in San Francisco. This road is in danger of failure if a severe seismic

event were to occur. This facility is not tolled, but other availability payment projects such as the I-595 Express in Fort Lauderdale (a $1.8 billion HOT lane and highway reconstruction project) and the $1.3 billion East End Bridge project near Louisville (in procurement) will be tolled. These tolling arrangements will allow project sponsors to recapture some of the cost of the availability payments from toll proceeds, while shielding their private partners from the revenue risks of underperforming toll facilities.

A Move Away for Early P3 Involvement

A third trend is also evident among the projects being implemented on a P3 basis: a movement away from early involvement of P3 partners in the definition of projects during environmental clearance and in favor of post-NEPA P3 procurements. This is the case with four out of the eight P3 projects in construction, as this research was being completed. Although there are clear merits to early involvement of private partners in the definition of projects, there are also counterproductive complications, as discussed in detail in Chapter 5. In general, P3 partners are far more interested in making money by implementing projects than by acting as consultants during project definition.

As witnessed by the experience with the South Bay Expressway, with its 16-year gestation period from 1991 (when the concession was awarded) to 2007 (when the facility finally opened), the risks of gaining clearance for projects are far too great for at-risk involvement by private partners. The high level of risk to the franchisee associated with South Bay Expressway project is frequently cited by private developers as one of the reasons that they are unwilling to consider early involvement in projects without a guarantee of compensation if the environmental decision does not permit the developer's preferred project to proceed. A senior MPO official notes that "investors want a project that is all wrapped up in a bow. Final approval of a NEPA document is highly advisable because experience has taught investors not to pursue projects that are pie in the sky."

Public project sponsors are also coming to this recognition, preferring to seek P3 procurements after NEPA to maximize competition and avoid the appearance of compromising the objectivity of any NEPA analysis or preferred alternative selection with the profit-seeking motives of the private sector. Early involvement also tends to reduce competition and the number of project cost comparisons available to the public sponsor (these issues are also discussed further in the South Bay Expressway section). Although early involvement can lead to good outcomes, a state like Virginia, which historically has accepted unsolicited P3 offers, is moving more toward post-NEPA solicited P3 procurements. Virginia is also taking a more programmatic approach in identifying projects that may be suitable for P3 development early on in their definition and then using the environmental review process to assess such a possibility, vetting it in front of the public.

The Attraction of P3 Projects

As will be discussed in Chapter 4, P3s bring a host of challenges to their implementation, so their benefits to implementation must ultimately outweigh the effort taken to overcome them. Initiation for P3 consideration rests with the public, likely rendered first through legislative authorization, followed by the decision to act on it, although in the case of unsolicited proposals, serious initial consideration of a particular project by a public-sector agency may be preempted by the private sector. Overall, the decision to pursue P3s is largely a public-sector one, and thus characterizing P3s' attractiveness derives mostly from the public sector's perspective. The attractiveness to the private sector can be explained more simply as business decision in response to available opportunity.

The Public-Sector Sponsor Perspective

The motivations for public-sector sponsors to consider implementing projects on a P3 basis are well documented and corroborated by those interviewed for this research. The principal attractions of P3s are the need to tap into new sources of revenue and finance to overcome funding gaps and the potential to benefit from design and long-term efficiencies compared with traditional procurement methods.

At both state and federal levels, budgetary constraints have led to a situation where the demand for improvements to U.S. surface transportation infrastructure far outstrips existing resources to provide for these needs. This gap can be attributed largely to impediments at the policy and funding level and, addressing the first point above, P3s have been increasingly seen as one opportunity to help bridge the gap. One recent U.S. DOT report cites the following failings within the existing institutional and financing setting for U.S. surface transportation as reasons for the increasing attractiveness of P3s (U.S. DOT 2008):

- Poor system performance—worsening traffic congestion and decreasing travel time reliability;
- Growing resource scarcity—traditional funding sources are decreasing or stagnant regarding inflation and increasing demand;
- Poor investment decision making—political processes impede projects with the greatest value from routinely being selected; and
- Contradictory policy goals—highway funding that relies largely on fuel consumption conflicts with efforts to increase energy independence and improve the environment.

In addition to the context in which P3s may help address the issues cited above, their advantages relative to traditional project delivery also contribute to their attraction. Two comprehensive previous research efforts are in broad agreement on the advantages of P3 procurements: the FHWA's *Transportation PPP User Guidebook* (FHWA 2007) and the National Conference of State Legislatures' *PPP Toolkit* (Rall et al. 2010). A summary of their results follows:

- Accelerated project delivery—P3s can help deliver transportation improvements at a faster rate than through traditional DOT project scheduling and delivery methods.
- Access to new sources of capital—private financing (although typically more expensive than public financing) offers the potential to realize additional or larger projects that otherwise would have been delayed or not built. Taxable equity and both taxable and tax-free debt can supplement or leverage scarce public resources.
- Introduction of life-cycle efficiencies—P3s can foster efficiencies over a project's life cycle throughout its construction, operations, and maintenance phases by
  - Encouraging innovation in service delivery;
  - Providing incentives in the P3 contract;
  - Offering potentially greater "value for money"; and
  - Facilitating involved parties' collaboration.
- Superior project quality—a P3 may facilitate a private partner's ability to apply improved design and construction techniques or technologies resulting from performance-based contractual terms (incentives) or warranties by applying a life-cycle costs approach that may result in higher initial quality to minimize long-term maintenance and operations costs.
- A better distribution of risks—allocating certain project risks to the private-sector (e.g., financing, schedule, long-term operations, and maintenance) and retaining others with the public agency (e.g., program management, environmental clearance, permitting, and right-of-way acquisition) may result in overall reduced project risk and costs.
- An opportunity for greater public accountability—though not without considerable controversy, there is some evidence to support the assertion that a comprehensive and transparent contractual arrangement with a private partner offers an opportunity to set project performance expectations and responsibilities to enhance public control over project outcomes.

Improving the Characterization of P3s

Despite the formal and accepted definitions of the forms of P3s presented earlier, several industry participants interviewed cautioned against adopting too narrow an interpretation of what a P3 is. A common pitfall with characterizing a P3 is to focus solely on its capability to act simply as a funding source, a financing tool, or a procurement method. Although in principle, these are standard features of a P3, too often a P3 is viewed by public decision makers faced with the issues outlined in the previous section (e.g., poor system performance, resource scarcity) as magic, that is, a solution to be introduced when the traditional approach fails. Without a full appreciation of how P3s generate value in practice, a tendency exists to adopt such a narrow definition, which in turn inhibits successful use or exacerbates challenges to implementation, such as building public and stakeholder support for the process. Careful consideration of when and why to contemplate a P3 procurement is often lacking.

This (and previous) research has concluded that there may only be a small subset of projects (although substantial on a total project cost basis) brought forth through the appropriate project development process where a P3 may be the most desirable option. With this in mind, a more nuanced interpretation of P3s' definitions with respect to the full value a P3 can offer may better facilitate the proper consideration of P3s throughout the planning and environmental approvals processes. As suggested by those interviewed, these characterizations focus on the cumulative effect of P3s' advantages as previously outlined. Two simple examples illustrate this reasoning.

P3s as Service Delivery Models

A P3 can act as a financing and procurement tool, which contributes to its value obtained through risk transfer to the private partner in arranging financing or guaranteeing delivery under a fixed price and schedule. The ultimate value of a P3 is derived from the necessary long-term service delivery approach taken. In the case of a P3 concession agreement, a private partner must consider the management of long-term operations and maintenance, which likely would include one or more cycles of major maintenance or renewal. The P3 agreement then guarantees a certain level of facility performance and condition during the concession period and at the point of hand back, shifting considerable risk to the private partner and generating value to the public sector that would not otherwise have been realized. This benefit can more than offset the potentially higher cost of securing private financing up front.

P3 as Means to Reduce Costs

A primary focus of the U.S. transportation infrastructure sector is on the problem of inadequate funding and the need to find more of it. From this comes the common misperception that P3s are beneficial because they provide a much-needed alternative funding source. However, this view is shortsighted and not quite accurate. Private partners can access a larger market for financing, albeit, at generally higher costs, and can contribute

their own equity, but a singular concern for greater funding is misplaced. Transportation discourse lacks a focus on reducing costs, when streamlining costs can be just as important as finding funding. A private partner may be much better positioned than a public partner to identify and take advantage of opportunities to reduce project construction costs through design efficiencies, especially if construction performance or long-term operational incentives are incorporated into the P3 agreement. Design efficiencies can be derived from technical expertise, access to superior technologies, or by capitalizing on the revenue risk model of the transaction. In this last instance, a private partner has an incentive to scale the scope of the project to its revenue potential by providing highway access or capacity where most appropriate, as the return on their investment is linked to roadway use. Naturally, this outcome is dependent on the extent to which the project's design can conform to the desires of the private partner compared, along with the expectations of the public sponsor, to prevailing design standards and constraints.

The Private-Sector Partner Perspective

A range of private-sector partners have participated in P3s in the United States and worldwide. A key, unifying attribute among partners considered in this research is their direct participation in the revenue risk and financing of the project through an equity contribution or obligation to debt issued on behalf of the project. The extent to which the partner has invested in the project, including the partner's subsequent role in promoting, defining, constructing, and operating the project long term, can vary: from a pure investor who only seeks a return on equity (such as a pension fund) to an infrastructure developer or concessionaire who manages a wider portfolio of facilities to a full-service design and construction engineering or contracting firm. Often in P3 ventures, two or more industry players come together as a team to synergize their respective skills and share in project risk. Certainly there are many other critical participants on the private side (e.g., technical, legal, and financial advisors, other engineering or technology service providers), but for those with a direct financial stake in the long-term success of a P3 project, those with "skin in the game," as multiple interviewees put it, the process for how P3s progress through the planning and environmental review processes are of utmost significance.

There is broad agreement among private partners that the political landscape, project size (large in scope), duration of project (e.g., a long-term commitment to achieve a return on investment), resolution level of large risk items (such as legal and environmental issues), and degree of public support are the most significant factors in evaluating the attractiveness of a P3 opportunity. Many interviewees pointed to the demonstrated need of the project or "criticality of the asset" as a crucial determinant for pursuing a P3. A highway project that solves an existing congestion or access problem is far preferable to a speculative venture where, for example, facility use is dependent on anticipated new residential or commercial development. Finally, in keeping with the business decision outlook inherent to private P3 partners, the appeal of a particular P3 opportunity may be dependent on a measure of the public-sector sponsor's credibility or ability to execute an appraisal of the competitive landscape. In addition, another factor is the likelihood of being selected as the preferred partner, along with other enterprise-level considerations, such as portfolio balancing in the case of a large concessionaire.

CHAPTER 3

Legal and Financial Issues with P3 Implementation

The implementation of P3 project raises legal and financial issues that are uncommon with traditional public-sector procurements. This chapter discusses these issues, providing the reader with an understanding of how these issues interface with the NEPA and planning processes.

The context in which public–private partnerships are contemplated, procured, and executed is largely driven by a statutory and regulatory framework established by the federal and state governments. To consider the implications and interaction of the P3 process with those in the Decision Guide requires a concrete understanding of relevant legal issues discussed in this chapter. In addition, federally mandated transportation planning requirements for state DOTs and MPOs play a central role in how and when P3 projects are considered or procured. These issues are discussed in more detail in Chapters 5 and 6. Finally, financing options and tools associated with P3s are also important drivers of identifying at what stage in a project's development the decision to use a P3 is made.

Legal Issues with P3 Projects

This section provides an overview of the requirements for gaining legislative or statutory authority to implement P3s and the essential federal regulations and statutes that guide their application and execution.

P3-Enabling Legislation/ Statutory Authority Constraints

Before being able to seriously consider a P3 alternative as part of the project planning and environmental review processes, the public owner must have the authority to procure and implement P3 projects. Although various federal statutes and regulations address particular aspects of design–build and P3 projects, those statutes and regulations do not supersede state and local laws. Authorization to engage in P3 procurements can come only from the state or local legislation. Consequently, unless a public owner's enabling authority already includes sufficient flexibility to allow P3 procurements, the agency will have to obtain separate authority.

Considering the different needs and political realities faced by public owners, it is not surprising that there is great variance between P3 statutes throughout the United States. Note that in addition to statutes granting design–build and P3 authority, public owners may obtain this authority from general legislation, state constitutions, city charters and other sources.

Legal Concepts Critical to Success

The following seven key legal concepts (among others) are critical to the success of P3 projects:

1. Permission to rely on reduced/alternative payment and performance security.
2. Authority to bundle design, construction, operation, maintenance, and other services into a single procurement.
3. For predevelopment agreement projects, the ability to contract with a private entity to assist the public owner in defining a feasible project and, if the project is deemed feasible, to negotiate an agreement to implement the project.
4. For toll projects, tolling and toll enforcement authority and the authority to compensate a private entity for losses it incurs due directly to the construction of previous unplanned competing facilities.
5. For availability payment projects, authority to obligate funding for multiple years.
6. Authority to use funding and financing from any available and lawful source.
7. Authority for a private entity to receive a return on its investment.

In addition to these key legal authorizations, public owners often need the flexibility to modify or waive otherwise applicable technical specifications. Without this flexibility, public

owners can be forced to implement specifications that inhibit the successful use of P3s.

Impacts to Planning and Environmental Review

Although each of the key legal concepts listed can be critical to the success of a P3 project, most do not directly affect the project planning and environmental approval processes. One exception, however, is the need for explicit authorization for the private entity to assist the public owner in defining a feasible project to later be developed by the private entity, which is at the heart of the first phase of predevelopment agreement P3 projects. Aside from granting this authority, P3-enabling legislation does not typically provide detail regarding how private entities are to conduct this predevelopment work. In contrast, and as discussed below, federal statutes and regulations specifically address what private entities with an interest in development of the project can and cannot do when performing this work on federalized projects. Similar to the restrictions put in place by federal statutes, state constitutions and other similar documents may address what private partners can and cannot do when performing design–build and P3 work. For example, Article 22 of the California constitution explicitly authorizes the state of California and other governmental entities to contract with private entities for architectural and engineering services. California voters established this authority by adopting a constitutional amendment in 2000 after a union that represents professional engineers in state government sought unsuccessfully to obtain a constitutional amendment that would have prohibited the contracting out of these services to private entities.

It is not uncommon for public owners who have obtained P3-enabling legislation to later discover that the legislation needs to be revised to address issues that the legislature did not anticipate. For example, the Florida Department of Transportation's (FDOT) P3-enabling statute, located in Section 334.30, has been revised seven times since it was first adopted in 1991. The revisions adopted in 2007 gave the department the authority to make availability payments and to lower the minimum required amount for payment and performance security (FL Stat. § 334.30). The specific revisions at issue were instituted by Section 50 of House Bill 985, which was passed during the 2007 legislative session and which the governor signed into law on June 19, 2007 (FL s. 50, ch. 2007-196). The department sought these revisions to address issues it was encountering with its first two P3 procurements: the Port of Miami Tunnel and Access Improvements Project and I-595 Corridor Roadway Improvements Project. Both projects reached financial close in 2009.

In some states, the P3-enabling legislation contemplates adoption of regulations by public entities to provide detail regarding how to implement the statute. As an example, the Utah Department of Transportation's P3-enabling statute requires the department to develop rules related to toll road development agreement proposals and procurements involving unsolicited proposals (Utah Code Section 72-6-204(1) and Section 72-6-205(3)). In certain cases, public owners may adopt regulations on their own volition to clarify ambiguities in the enabling statute.

Federal Statutes and Regulations

P3 transportation projects that will be funded in whole or in part with federal highway funds or that are federalized for any other reason are subject to certain federal requirements. For projects funded by FHWA, this includes not only Title 23 of the United States Code and FHWA implementing regulations found in Title 23 of the Code of Federal Regulations but also several other federal laws that apply to the grant of federal funds. Those laws include the NEPA and potentially as many as 40 other environmental laws and regulations.

Design–Build Contracting

Of particular importance to P3 transactions are the federal requirements governing design–build contracting, as P3 projects fall within the definition of design–build contracts in the laws governing federal-aid contracts (see 23 U.S.C. § 112 and 23 C.F.R. pt. 636). Other provisions dealing with design–build contracting are scattered throughout FHWA's general contracting requirements, found in 23 C.F.R. pt. 635. (Additional provisions are also found in 23 C.F.R. pt. 627, pt. 637 and pt. 710.)

Section 636.109 of Title 23 C.F.R. provides specific constraints applicable to public owners that intend to award a design–build contract (including P3 contracts) before the completion of the NEPA process (see also 23 U.S.C. § 112). Consistent with the specific protections put in place through NEPA regulations (see 40 C.F.R. pt. 1506.1 [restricts certain actions during the NEPA process]), Section 636.109 includes provisions stating that before the completion of the NEPA process,

- The public owner may authorize the private entity to proceed with preliminary design (as defined).
- The private entity may provide assistance in defining the project alternatives, but cannot prepare the actual NEPA document or have any decision-making responsibility with respect to the NEPA process.
- The design–build contract must prohibit the private entity from proceeding with final design (as defined) or physical construction activities for any project component for which the NEPA process is not complete.
- The design–build contract must ensure that the merits of all alternatives, including the no-build alternative, are evaluated and fairly considered and that no commitments are

made to any alternative being evaluated under the NEPA process.
- The design–build contract must include termination provisions in the event that the no-build alternative is selected.

These provisions enable public owners to obtain the benefit of bringing the private entity into the project early enough to allow it to participate in shaping project concepts while also protecting against the possibility that the private entity's participation could improperly influence the environmental review process. For example, the provisions described permit the private entity or design-builder to define potential project alternatives and contribute underlying data to the environmental review process but do not permit the private entity or the design-builder to serve as a joint lead agency in the environmental review process. They cannot control the environmental review process or be a preparer of any formal NEPA document, such as an EIS or environmental assessment (EA). (23 C.F.R. § 636.109(b)(6) and 40 C.F.R. § 1506.5(c)). However, this does not prevent the transportation agency from asking this private partner to produce studies and other information related to the environmental process, or, more generally, to provide its view of key project-related issues. Indeed, nothing prevents the private partner from providing such information or views of its own accord under these rules.

By prohibiting the private entity from proceeding with final design or with construction for any project segment before completion of the NEPA process, the regulation guards against the risk of a private entity intentionally or unintentionally pushing a public owner toward a particular alternative. These constraints also protect the private entity from risking loss of significant amounts of money expended in support of a project alternative that ultimately is not selected.

In 1998, Congress authorized the use of design–build (including P3) contracting for federal-aid highway projects with the passage of the Transportation Equity Act for the 21st Century (TEA-21). This is Pub. L. No. 105-178, §1307, 112 Stat. 107 (1998). The regulations fully implementing this section were issued in 2002 at 67 Fed. Reg. 75926 (December 10, 2002). The regulations include revisions to various provisions of the FHWA regulations, as well as the addition of a new part 636 of Title 23 C.F.R. Pending the issuance of these regulations, FHWA specifically authorized the use of design–build contracting through its ongoing "experimental" program. Before the passage of TEA-21, Title 23 made design–build contracting impossible because it required public owners to award design contracts based on a qualifications-based selection process and to award construction contracts to the lowest responsible responsive bidder. However, starting in 1990 the FHWA began to allow agencies to evaluate design–build contracting and other nontraditional contracting techniques on a project-by-project basis through its SEP-14 program; the official name of this program is Special Experimental Project No. 14—Alternative Contracting. The TEA-21 authorization and subsequent adoption of the design–build rule by the FHWA was, in large part, a result of the successes achieved under the SEP-14 program.

SEP-15

The FHWA has also established Special Experimental Project 15 (SEP-15), which allows experiments more specifically focused on P3 projects. The stated intent of SEP-15 is to allow agencies to explore alternative contracting, environmental approval, right-of-way acquisition, project finance and transportation planning processes that deviate from Title 23 U.S.C. and applicable FHWA policies and regulations—subject to the caveat that the FHWA's experimental authority does not allow it to waive laws outside of Title 23 U.S.C. or the policies and regulations of any agency other than FHWA. Various state DOTs have used this program to explore innovative techniques on federal-aid P3 projects. According to the FHWA's website, DOTs from Alaska, California, Florida, Idaho, Mississippi, Oregon, Texas, and Virginia have used the SEP-15 program (FHWA 2012b).

These same agencies have used SEP-15 to enter into P3 agreements before completion of the NEPA process—enabling them to integrate private-sector ideas and innovation into the environmental/permitting approval process and to streamline the process of obtaining loans under TIFIA [23 U.S.C. §§ 601-609 (2006)]. As previously noted, current design–build regulations permit award before completion of the NEPA process: the change in the regulation was the result of direction from Congress in the 2005 transportation reauthorization bill, known as the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) [see 23 U.S.C. § 112(f), added by §174 of Pub. L. No. 109-59, 119 Stat. 114 (2005)]. Although the FHWA continues to encourage SEP-15 applications, no SEP-15 projects have been approved since 2008 (FHWA 2012b).

State DOT and MPO Planning Requirements

Planning requirements for all transportation projects including P3s coincide with the first two phases of the Decision Guide: long-range planning and programming.

Long-Range Planning

The first phase in the Decision Guide covers long-range planning. Federal law requires that states and metropolitan regions develop and update long-range transportation plans addressing needs and policy over a 20-year period. According to the

federally mandated law the Statewide Long-Range Transportation Plan (SLRP), DOTs have a certain degree of flexibility in how they approach long-range planning and can develop plans that are primarily policy-oriented or that include a specific list of projects that will be needed. This federally mandated metropolitan planning process requires all urbanized areas in the country with populations of more than 50,000 to produce a long-range plan that identifies projected transportation and policy needs over a 20-year horizon. This regional planning requirement is undertaken by MPOs, which are transportation policy bodies comprising representatives from local transportation agencies and governments. The essential characteristics of these planning documents are summarized in Table 3.1.

Although there is overlap between the long-range planning responsibilities of state DOTs and MPOs, the primary difference in their respective responsibilities is the federal requirement that MPO long-range plans be financially constrained. States may, but are not required to, include financial plans in the state long-range plan. This means that they must include estimates of reasonably available financial sources for operations, maintenance, and capital projects and include cost estimates for proposed improvements, while limiting mention of capital projects in the plan to those that can be funded from the revenues. In addition to meeting financial constraint requirements, the MTP must go through the process of conformity to assess its consistency with state air quality goals, as discussed later in this chapter.

Project Programming

In addition to long-range transportation plans, federal law requires that states and MPOs also maintain nearer-term TIPs. For states this document is called the state transportation improvement program (STIP); it identifies projects in the MTPs/SLRP that will be completed in the coming 4-year cycles (see Table 3.1). The programming phase of the Decision Guide aligns with the completion of the TIP and STIP programming, and similar to the long-range planning phase, involves compiling information on project definition, financing, and air quality compliance. However, because TIP and STIP programs are composed of a smaller number of projects that have been defined at a greater level of detail, the analyses and decisions involved in preparing the TIP and STIP are more nuanced than those of SLRP.

Like MTPs, TIPs and the STIPs must be fiscally constrained. TIPs are also subject to conformity analysis to demonstrate that a region will meet air quality standards after the projects are implemented. (The sections that follow will discuss requirements for funding availability and fiscal constraint, with a focus on application to P3s, and transportation plan conformity.) A state DOT solicits or identifies projects from areas of the state outside the boundaries of MPOs that are included based on adopted procedures and criteria. TIPs developed by MPOs must be incorporated without change into STIPs. Typically, a STIP is developed for a time period consistent with that of a TIP.

Unlike long-range planning, programming does not involve establishing an overall transportation policy vision for regions. Instead, it focuses on developing a near-term implementation plan that reflects the regional vision and policy priorities articulated during long-range planning. The programming phase of the Decision Guide is iterative, recurring at least once every 4 years and more frequently if changes are made to a TIP or STIP. As is often the case resulting from the natural progression from draft environmental impact statement (DEIS) alternatives to a preferred DEIS alternative, the definition of the project in the TIP or STIP must also be updated for consistency purposes before environmental approval can be obtained. These types of refinements involve not only the physical definition of the project but also operational and policy issues, such as the decision to operate new capacity as priced lanes or toll facilities. If the decision is made to introduce tolling on a facility, that decision could potentially lead to the delivery of the project as a P3. This could have a significant impact on the fiscal constraint assumptions included in the TIP or

Table 3.1. Long- and Short-Range Transportation Planning Documents

Plan Type	Who Develops?	Who Approves?	Time Horizon	Content	Fiscal Constraint Requirement	Update Requirement
MTP	MPO	MPO	20 Years	Future goals, strategies, and projects	Yes	Every 5 years; 4 years for non-attainment and maintenance areas
SLRP	State DOT	State DOT	20 Years	Future goals, strategies, and projects	No	Not specified
TIP	MPO	MPO/Governor	4 Years	Transportation investments	Yes, by year	Every 4 years
STIP	State DOT	U.S. DOT	4 Years	Transportation investments	Yes, by year	Every 4 years

Source: Adapted from *The Transportation Planning Process: Key Issues* (FHWA and FTA 2007).

STIP, because P3 procurements have the potential to reduce the level of public investment needed to implement projects, thereby allowing the TIP or STIP to include other projects not otherwise eligible for the short-term implementation program resulting from limitations on public funding.

If permitted by law, unsolicited P3 offers may also result in a private developer proposing a project that was not included on the TIP or STIP. A private developer may also propose substantive changes to existing projects, such as operating them as toll facilities rather than nontolled general purpose capacity. Although such changes may cause concern among those unfamiliar with P3 projects, P3-enabling legislation allowing unsolicited P3 offers also establishes processes for DOTs to judge whether any unsolicited offers have merit and to ultimately to make the decision whether an unsolicited P3 offer will be advanced or terminated. The next step in most cases is a call for competing bids to the unsolicited offer. P3 authorizing statutes in some states (e.g., Ohio) require consistency with the planning and programming process for any unsolicited bids.

Understanding Funding Availability and Fiscal Constraint with P3s

Revenue forecasts used to demonstrate fiscal constraint in the MTP, TIP, and STIP must be "reasonably expected to be available." There is some degree of interpretation within this requirement. FHWA's Office of Planning, Environment, and Realty offers guidance and examples of what is considered reasonable and not reasonable (FHWA 2009). Revenue forecasts are permitted to include "new funding sources and levels of funding not currently in place." The funds may require future action by a legislative or executive body, and the reasonableness of such an occurrence can be projected based on past historical trends. FHWA suggests two important considerations in determining a revenue assumption to be reasonable: evidence of a review and support of the new revenue assumption by state and local officials and documentation of the rationale and procedural steps to be taken, with milestone dates for securing the funds.

One "reasonable" example is this:

> A new toll or other user fee dedicated to a particular project or program may be reasonable if there is clear evidence of support by the Governor, legislature, and/or other appropriate local/regional decision makers and a strategy exists with milestones for securing those approvals within the time period for implementing the affected projects. (FHWA 2009)

The same guidance memorandum discusses the treatment of innovative finance techniques and P3s in MTPs, TIPs, and STIPs. As with traditional funding sources, those sources associated with financing a P3 project must be "reasonably expected to be available." A P3 may be reasonable under the same considerations, as in the example given. In addition,

> Other indictors of "reasonableness" for [P3] projects are if a State or local jurisdiction has had past success in implementing [P3s], and if State-enabling legislation is in place, or if efforts are under way to enact State-enabling [P3] legislation and there is evidence of support by the Governor and/or legislature. There should also be interest in the project from the investment community. (FHWA 2009)

Funding sources associated with innovative finance techniques, including tolling and pricing and various debt instruments (which, along with private equity, are often integral to a P3s' financings), must be reflected in the MTP, TIP, and STIP financial information and in other supporting financial plans. Again, in-place enabling legislation that allows a state or a locality to pursue tolling is a key step in determining fiscal constraint reasonableness.

Nonattainment and Maintenance Areas

An exception to the requirement regarding reasonable availability of funding occurs in air quality nonattainment and maintenance areas, limiting projects in such areas appearing within the first 2 years of a TIP and STIP to those with funding that is available or committed, as defined in Section 450.104 of Title 23 C.F.R.:

> *Available funds* means funds derived from an existing source dedicated to or historically used for transportation purposes. For Federal funds, authorized and/or appropriated funds and the extrapolation of formula and discretionary funds at historic rates of increase are considered "available." A similar approach may be used for State and local funds that are dedicated to or historically used for transportation purposes.
>
> *Committed funds* means funds that have been dedicated or obligated for transportation purposes. For State funds that are not dedicated to transportation purposes, only those funds over which the Governor has control may be considered "committed." Approval of a TIP by the Governor is considered a commitment of those funds over which the Governor has control. For local or private sources of funds not dedicated to or historically used for transportation purposes (including donations of property), a commitment in writing (e.g., letter of intent) by the responsible official or body having control of the funds may be considered a commitment.

This is a much stronger requirement than being "reasonably expected to be available," because the funds must already exist or be based on clear historical trends. The new funding allowance of what can be considered reasonable, which relies on future authorizing actions, becomes difficult to justify as

either available or committed. This requirement can present a problem for P3s, since the plan of finance for P3s usually cannot be finalized until after the conclusion of the NEPA process. Obtaining a FONSI or ROD requires that the entire project as described in the environmental document be consistent with the MTP. Approval must also come from a STIP/TIP in the case of a "regionally significant project," defined in 23 C.F.R. pt. 450.104 as having a direct impact on regional transportation needs and being normally part of the metropolitan or regional transportation network model. They may require federal funds (FHWA 2011). But before the MTP or STIP/TIP in nonattainment and maintenance areas can be approved, financial constraint must be demonstrated. There is some flexibility in proposing P3s in the later years of the MTP, but funding must be available and committed in the first two years of TIP/STIP. Adding P3 to the TIP/STIP would be difficult since the funds are not yet committed until financial close. This is why FHWA advocates involving discussion of P3s early in planning.

The approach adopted by FHWA to managing fiscal constraints for P3s in nonattainment and maintenance areas is to apply many of the same tests to determine whether funding is "reasonably expected to be available," including ensuring enabling legislation is in place, weighing evidence of support, and examining the prior track record on P3s. FHWA has tended to defer to cost estimates in the TIP, checking for consistency with the most recent version of the project's financial plan. In addition, it may also rely on a letters of commitment from the parties involved, in the case of a private partner's equity contribution or a commercial bank's intention to lend money. Finally, FHWA may also consider evidence of other assurances, such as those required of TIFIA. Without a final NEPA decision, TIFIA credit assistance cannot be secured, but the application process requirements (e.g., a detailed financial plan with sources and uses of funds and cash flow pro forma) typically are developed up to 1 year in advance and may be available to assist in better demonstrating the reasoning and likelihood of funding availability.

Transportation Plan Conformity

In nonattainment and maintenance areas, the MTP and TIP also must go through the process of conformity to assess consistency with the state implementation plan (SIP), a federal requirement under the Clean Air Act that sets forth how a state will comply with federal air quality standards. A SIP includes an emissions inventory based on actual or modeled emissions by category, including on-road, mobile source emissions. Established targets for this category of emissions yield a motor vehicle emissions budget, against which new projects' impacts must be measured. Conformity is demonstrated by showing that the plan's proposed projects will not cause or contribute to new violations of the National Ambient Air Quality Standards, increase the frequency or severity of existing violations, or delay the timely attainment of the standards or an established interim milestone. Conformity also includes confirmation that established Transportation Control Measures, strategies that affect traffic patterns or reduce vehicle use such as HOV lanes and bicycle facilities, are being implemented on schedule, as included in the SIP and programmed in the TIP.

The conformity determination is made by the MPO policy board, followed by a determinations issued by both FHWA and the Federal Transit Administration (pursuant to 40 C.F.R. pt. 93) that the MTP and TIP meet conformity requirements. Except for administrative modifications, a conformity determination must be made each time an MPO updates or amends its MTP or TIP and at least every 4 years. A conformity determination is also required within 24 months of an approved SIP or SIP revision.

Finally, certain nonexempt projects—any potential P3 would assuredly be a nonexempt project—must be assessed individually for conformity, if located in carbon monoxide or particulates found in nonattainment and maintenance areas. The project's impact on localized concentrations ("hot spots") of carbon monoxide and particulates are weighed against the natural ambient air quality standards. This analysis is typically performed during the NEPA process.

P3s and Project Finance

A prime benefit of P3s is the availability of project finance alternatives that become possible when the private sector is involved in a project. Among the primary advantages of P3s are a private partner's potential equity contribution and the partner's willingness to accept responsibility for arranging often complex financing while accepting risks that often increase the probability that a project will proceed or, ultimately, lower its overall cost. P3 project finance can be a significant issue prior to the completion of the environmental review process.

Public and Private Financing Options

Even though cost considerations should not be the main focus of the NEPA process, the financing options available to a public owner can ultimately impact a final NEPA decision. Historically, public owners have financed transportation projects using available public funding, proceeds from the sale of public bonds and, if permitted, toll revenues (which back toll revenue bonds). P3 projects increase the number of options available to public owners to finance their projects. Private entities often contribute equity to P3 projects and have access to private bank and bond financing. Under P3 agreements, the public owner may completely shift the responsibility for project financing to the private sector with no recourse (e.g., certain

toll concessions) or may retain ultimate responsibility to pay for the project, but extend the time period for payments to the private entity beyond substantial completion of the project (e.g., design–build–finance agreements and availability payment concessions). Although private financing interest costs can be more expensive than public financing, in some cases the total amount required to be financed is reduced as a result of innovative ideas to reduce project costs, the investment of private equity, and the private partners' agreement to accept risks that would otherwise have to be covered by the financing. In certain circumstances, such as the recent financial crisis, public agencies may also be precluded from accessing the traditional municipal debt market.

In addition to these P3 financing options described, the federal government has made certain programs and tools available for public owners/private entities to use on P3 projects. These tools have played an important role in enabling the recent success of P3 projects throughout the country. One such tool is the U.S. DOT TIFIA program, which has been used on 14 different highway P3 projects (FHWA 2012c). Through this program, U.S. DOT provides federal credit assistance in the form of direct loans, loan guarantees, and standby lines of credit to finance transportation projects of regional and national significance. TIFIA financing is often the most affordable form of financing available to private developers for P3 projects because the interest rate is linked to the favorable U.S. Treasury market rate. In addition, U.S. DOT has generally been willing to agree to long maturities on TIFIA credit instruments with deferred repayment schedules (the maximum maturity for TIFIA credit instruments is 35 years after substantial completion). The pairing of these aspects of the financing allows private developers to repay their more expensive debt first and pay back the principal amount of the less costly TIFIA financing last, thereby creating a less costly overall financing package. Developers cannot finalize these packages, however, until after the NEPA process is complete, because U.S. DOT cannot approve TIFIA loans nor make any other contractual funding commitments prior to the completion of the NEPA process. The approval of TIFIA credit assistance through execution of a term sheet is a federal action and, hence, cannot occur until after NEPA analysis is completed (see 40 C.F.R. pt. 1506.1 and 23 C.F.R. § 771.113). This requirement is also reflected in FHWA's regulations and in TIFIA [see 23 C.F.R. § 771.113 and 23 U.S.C. § 602(c), respectively].

It should be noted that many public owners are not familiar with TIFIA or other public-sector financing tools, such as tax-exempt private activity bonds. Nor do many public owners have experience with the details of private financing. As a result, for public owners to successfully navigate the financing issues related to P3 projects, it is often necessary for them to hire financial consultants and private law firms familiar with both public and private financing markets.

Factors Influencing the Use of Different P3 Options

Successful P3 projects do not all have the same financing structure or the same need for public-sector funding. For example, certain projects that produce revenues, such as toll roads, may be fully self-funding without any need for public funds to supplement toll revenues. This was the case with the TxDOT's SH-121 project, the Sam Rayburn Tollway, before the selected private entity lost the project to the North Texas Tollway Authority. In most cases, however, the projected revenue from a proposed project will not be sufficient to cover the private entity's costs and return on investment and consequently additional public funding is needed to make up the difference. This was the situation for FDOT's I-595 Corridor Roadway Improvements Project.

There is often a close relationship between the types of public funding available for a project and the type of P3 a public owner can successfully pursue. Some funding is only available for a specific fiscal year or for a specific purpose. Accordingly, even if a P3 project is technically feasible, it may be financially feasible only if the right types of funding are available at the right time.

This dynamic is evident in recent availability payment P3 projects. With availability payment arrangements project sponsors typically defer payment to the private partner until the project is opened for service. For these arrangements to work, the sponsor needs one or more dependable revenue sources over the lifetime of the concession period. Sponsor revenues may include tolls collected on the facility or other funds. Although availability payment P3 structures shield private partners from revenue risk, the private partners and their lenders must be convinced that the public owner has secured and dedicated the required funding to the project or has a clear, reliable process for obtaining the necessary approvals for public funding. Private entities may demand additional reassurances from the public owner that it has in fact obligated these funds before agreeing to proceed with assembling financing for an availability payment project.

CHAPTER 4

Managing Challenges with Implementing P3s

Implementing projects on a P3 basis raises challenges for their sponsors and often requires fundamental change in the way that transportation agencies do business. This chapter discusses the challenges posed by the need to conduct a range of new technical analyses, the need for greater coordination between NEPA and the planning process with P3 procurements, and the need to manage new concerns and issues that the public may have in response to P3 procurements.

Although public agencies regularly engage private-sector engineers and contractors to complete design and construction activities, P3 procurements transfer the responsibility for defining, constructing, and operating large, high-profile projects from the public sector to their private-sector partners. A cultural change within DOTs and buy-in and support from their stakeholders at all levels are required. P3 procurements also require different types of approvals, the development of new areas of expertise within sponsoring agencies, and coordination with the planning and environmental review processes. All of these issues are discussed in this chapter.

Challenges Associated with P3 Implementation

Legislative Authorization

There are challenges and many unknowns associated with putting any type of legislation in place (a list of seven key legal concepts required to enable P3 procurements is found in Chapter 3). The extent to which these challenges come to bear on individual projects depends on whether the required legislation is in place at the time that P3 procurement is first considered or whether it is needed before a project can proceed on a P3 basis. There is also risk that existing legislation may need to be modified in some way to respond to unforeseen issues associated with P3 projects or procurements.

As of March 2012, 32 states and Puerto Rico have enacted laws authorizing the use of P3s for the development of bridge or highway projects (Rall 2012). Ten of these states have placed certain limitations on the use of P3s or have restricted their use to specific projects. The remaining 22 states and Puerto Rico have enacted broader scope P3 authority.

The legal authorization needed to advance P3 projects may be initiated in a top-down manner by state governments. This scenario may arise if legislators are interested in the use of tolling to help overcome revenue gaps, and if they are interested in capturing the long-term operational value that P3s can provide. In some cases, state legislatures have put the necessary laws in place and also have required the DOT to assess the feasibility of proposed projects for development as tolled facilities or P3 procurements. The top-down approach does not ensure that there will be interest on the part of individual regions or transportation agencies in developing partnership projects, but it does encourage the consideration of P3 options and removes perhaps the most fundament barrier to P3 procurements.

Legislative authorization may also be put into place in a bottom-up manner. A transportation agency, MPO, or elected official may advocate for the development of a specific project on a P3 basis or perhaps for the idea of approaching P3 development on a broader programmatic basis. In this case, P3 proponents need to advocate for the use of a P3 and to obtain necessary enabling authorization. They also need to educate legislators about P3 delivery and the rationale for its use to get the needed legislation passed. Even with a strong rationale for the use of P3s or tolling with considerable interest at the local level, there is no guarantee that needed legislation will result. Gaining the necessary legislative approvals for the use of tolling and P3 procurements is a prerequisite for establishing regional or state policies on the use of these tools by MPOs, state DOTs, or by state legislatures. These types of programmatic policy positions on the use of tolling and P3s are more effective in encouraging the use of these tools than the basic legislative authorities that make them possible.

New and Complex Analyses and Cultural Change for P3 Sponsors

The development of P3 projects is a time-intensive and complex process that requires areas of expertise that the majority of public-sector transportation agencies do not possess. Many of these activities take place outside the planning and NEPA processes addressed in the Decision Guide. These areas (some of which are described in greater detail in the section on P3s requiring technical analyses independent of NEPA and the planning process) include

- Financial feasibility assessments;
- Financial modeling;
- Preparation of detailed investment-grade toll revenue forecasts;
- Risk transfer analysis;
- Preparation of long-term life-cycle maintenance and operations cost forecasts;
- Public-sector comparator analysis;
- Toll collection and back-office accounting procedures; and
- Numerous legal and contractual issues associated with long-term concession agreements lasting 30 to 50 years or more.

The Challenge of Developing New Areas of Expertise within DOTs Implementing P3s

Looking at the typical organizational structure of P3 projects, public agencies only have experience with a few of the work streams involved. Moreover, P3 transactions require highly specialized skills that governmental agencies do not and cannot staff. Therefore, government project sponsors generally retain experienced consultant to advise them in areas such as legal, commercial, financial, and some technical analyses. With construction costs often in excess of $1 billion and involving many parties, P3 projects are also likely to be much more complex than typical DOT assignments. Private partners also have to coordinate with lenders, rating agencies, equity partners, technical advisors, and subcontractors, as well as with DOTs. Their operational situation is much more complex than what public-sector sponsors may appreciate.

Agencies that operate toll facilities may be familiar with some of these activities, but to implement a P3 project or to even consider possible use of P3 strategies, DOTs without experience in this area can be expected to require new staff with the necessary expertise to oversee and work with the array of consultants and parties involved in the typical P3 transaction. As a result of retaining staff with specific expertise and the time-intensive nature of P3 procurements, several states with active P3 programs have created dedicated departments responsible for conducting P3 feasibility assessments and shepherding P3 procurements.

Agencies considering or implementing P3 projects also rely heavily on consultant support to establish a structural approach to P3 issues and to perform the required technical analyses. In addition to design consultants, public agencies sponsoring P3 projects are likely to engage the services of management consultants, financial advisors, traffic and revenue advisors, and legal advisors. They may also need access to design consultants with expertise in electronic toll collection.

It is essential for agencies implementing P3 projects to have access to the best possible advisors, because they will be negotiating with large and sophisticated private firms well versed in project finance. Moreover, when private firms engage in P3 projects, they are entering into long-term partnerships of 30 to 50 years or more to develop projects with implementation costs frequently measured in the billions, often while contributing several hundred million dollars of their own equity. These firms engage world-class advisors themselves, and it is essential that sponsoring agencies do the same so that all negotiations are undertaken on an equal footing.

In addition to the technical areas of expertise, the implementation of P3 projects shifts responsibilities for completing tasks that are normally undertaken by public agencies to the private sector. Public agencies experience a cultural shift because of this dynamic, and as one P3 practitioner who has worked in both public and private settings observes, "one of the biggest challenges for [public agencies] in implementing P3 projects is fighting the 'this is the way we have always done it' attitude." As another private practitioner observes, "For every guy that is helpful, there are ten guys throwing sand in the gears. The public sector generally likes to control things, and this is especially true the lower down one goes in public organizations."

P3s Require Technical Analyses Independent of NEPA and the Planning Process

Although a decision to undertake a P3 project procurement must be made usually within the framework of transportation planning and environmental approval processes (or in the postenvironmental approval period), proper P3 consideration requires special technical analyses often conducted independently from, or in addition to, the standard planning and defined NEPA processes. These range from high-level P3 feasibility studies, which can initially be derived from a corridor or regionwide toll feasibility examination, to project-specific P3 valuation techniques.

The public entity responsible for a particular study or technical analysis may vary depending on the institutional makeup of a state or region, or where within the project development cycle the study is performed. An MPO may take the lead evaluating a metropolitan region for toll road feasibility (a single corridor or network of toll roads) that can incorporate a

preliminary analysis of financial feasibility and procurement methods. P3s can be included among analysis of potential project delivery mechanisms. Further into the project development cycle, a DOT or special office within or outside the DOT (likely with consultant support) may perform specialized valuation analyses on a candidate P3 project or set of projects. Collaboration may take place among agencies (e.g., MPOs, DOTs, toll road authorities, or transit agencies, in the case of a multimodal facility) to assess project feasibility.

P3/Toll Feasibility

Toll feasibility assessments are used to identify which projects may have the potential to generate a significant portion of their costs through toll revenues. Toll feasibility studies are most helpful if they are conducted while projects are in the early phases of conceptual development. These studies can be project specific or programmatic, and can range from ad hoc to formalized processes. Often P3 feasibility is addressed as part of a broader toll feasibility study. For the purposes of accounting for special technical analyses that may occur independently of, or in parallel to, standard transportation planning processes, toll feasibility is an important consideration because all P3s require a project revenue source, typically from a toll. Several examples from the Phoenix and Washington, D.C., metropolitan areas and the Commonwealth of Virginia illustrate these types of assessment.

The Maricopa Association of Governments (MAG) is exploring the possible development of a regional system of priced managed lanes and developing a managed lanes network development strategy. This study seeks to identify highway corridors in greater Phoenix, where the development of managed lanes may be promising, providing a framework for subsequent analyses. These analyses include an assessment of the different procurement models that could be used to implement managed lane projects, including P3 delivery, as well as revenue and financing options that could be used to help fund them. MAG's intent is to use this information to help focus future assessments, and ultimately to inform decisions on these issues.

The National Capital Region Transportation Planning Board (TPB), the MPO for greater Washington, D.C., has also completed a study to identify a network of priced highway facilities in its region. Although only three of the projects included in the network are in its long-range plan, discussions with TPB planning officials revealed that they are confident that other pricing projects are feasible and hope the study will generate interest in advancing other pricing projects, either as public procurements or private partnerships.

The Commonwealth of Virginia has recently revised its guidelines for identifying P3 candidate projects under its new Office of Transportation Public–Private Partnerships (OTP3) that oversees the implementation of P3s across all modes. The *Public–Private Transportation Act of 1995 Implementation Manual and Guidelines* (Commonwealth of Virginia 2010) prescribes a formal process to identify, screen, prioritize, and select transportation projects for P3 development. It begins with a scan of various planning documents, including the commonwealth's long-range plan (LRP) and STIP, as well as directives from the General Assembly. These documents are developed by transportation agencies' planning staffs, modal offices, and MPOs. All selections go through a high-level screen twice per fiscal year and a detailed screen at least once every 2 years. Unsolicited proposals are screened during this process, as well. Recommendations are made by a steering committee and prioritized into short-, medium-, and long-term time frames by strategically analyzing anticipated project costs and benefits, as well as the overall business case. P3 implementation selections are made from this prioritized list and must go through extensive public involvement, NEPA, a procurement strategy assessment, and an initial "value for money" (see definition that follows) before actual procurement. Although this P3 feasibility and project selection process interfaces and parallels the long-range planning, programming, and NEPA processes, it nonetheless is managed separately and requires additional specialized considerations beyond what is required of a traditionally delivered program of projects.

P3 Valuation

P3 valuation analyses are used by project sponsors to determine what the cost of developing individual projects would be if they were built and operated directly by the sponsor. These analyses serve as a base against which proposals to implement projects on a P3 basis may be compared. A recent National Cooperative Highway Research Program (NCHRP) product, *NCHRP Synthesis 391 Public Sector Decision Making for Public–Private Partnerships* (Buxbaum and Orti 2009) summarizes a broad spectrum of federal, state, regional, academic, and industry resources. The report identified several P3 valuation tools that have been used in the United States, each of which is designed to establish a comparative investment relationship between using a P3 and pursuing another action, often a traditional project delivery method. The most widely accepted—and used extensively in other markets internationally—is value for money (VfM). Other techniques include shadow bids (the public-sector's preparation of a detailed cost estimate and financial model to compare with solicited private-sector bids) and market valuation (quantification of the value a particular toll road might attract from a private investor), both of which have been applied in Texas. An asset valuation process was used in the long-term leases of the Chicago Skyway and Indiana Toll Road to estimate the value to the respective states associated with leases of their roadways.

VfM is defined in *NCHRP Synthesis 391* as a financial model that "calculates the difference between the costs and benefits

associated with both traditional and [P3] procurements." As an example, Virginia's OTP3 has incorporated VfM into its statewide procedures for P3 procurements. Its Public–Private Transportation Act (PPTA) Value for Money Guidance (OTP3 2011a) states that "VfM [is achieved] when—relative to a public-sector procurement option—[the P3 project] delivers the optimum combination of net life-cycle costs and quality that will meet the objectives of the project and the commonwealth." It consists of a quantitative assessment that calculates "the monetary value of the benefits achieved by using a [P3] procurement process, less the higher costs of private finance, relative to public funding" and a qualitative assessment that takes into account "factors that cannot be expressed in monetary terms, such as any predicted differences in service quality between the delivery options."

Often, to apply VfM, a public-sector comparator (PSC) model is developed that attempts to capture the life-cycle project costs (construction, operations, maintenance, and additional improvements) if the project were developed using traditional public resources and delivery methods. Then, "an estimate of VfM is achieved by calculating the present value of the PSC and . . . comparing it with one or more bids from private companies" (Buxbaum and Ortiz 2009). One weakness identified with the PSC approach is that elements associated with public versus private development may be too different to allow a meaningful comparison. In addition, application of the PSC and computing VfM have been criticized for representing only a hypothetical scenario, with varying degrees of uncertainty associated with the necessary inputs and assumptions. The appropriate inputs characterizing a project's design and life-cycle operations, including refined traffic and (toll) revenue studies are only known with a degree of uncertainty that can vary depending on when the analysis is conducted. This variability in timing illustrates how this type of analysis is not easily associated with a particular project decision point or even development phase, as defined in the Decision Guide.

Risk Analysis

P3s may warrant additional project-specific analyses (such as risk analysis) as employed, for example, by the Virginia OTP3. Risk analysis may or may not be applied to traditionally delivered projects as well and is a requirement of FHWA's Major Projects process. Risk management is undertaken throughout a P3 project's life cycle and begins in the early stages of project development with the creation of a risk register to track the identification and mitigation of risk items. Risk analysis includes identification of "strategies to reduce the likelihood and/or impacts of risks [and] . . . strategies to allocate risk to the parties best able to manage their impact" (OTP3 2011b). The ability to optimize risk transfer is critical to maximizing VfM.

Figure 4.1 illustrates the linear and cyclical nature of the Decision Guide processes. NEPA occurs once for each project and culminates in a categorical exclusion (CE), FONSI, or ROD, at which time project definitions are established, typically to the level of preliminary (30% or less) design. NEPA also requires interaction with the planning process, which was described in detail in Chapter 3. Figure 4.1 illustrates that by contrast to NEPA (and corridor planning), the planning process is cyclical, involving the preparation of the short-range TIP and the long-range MTP.

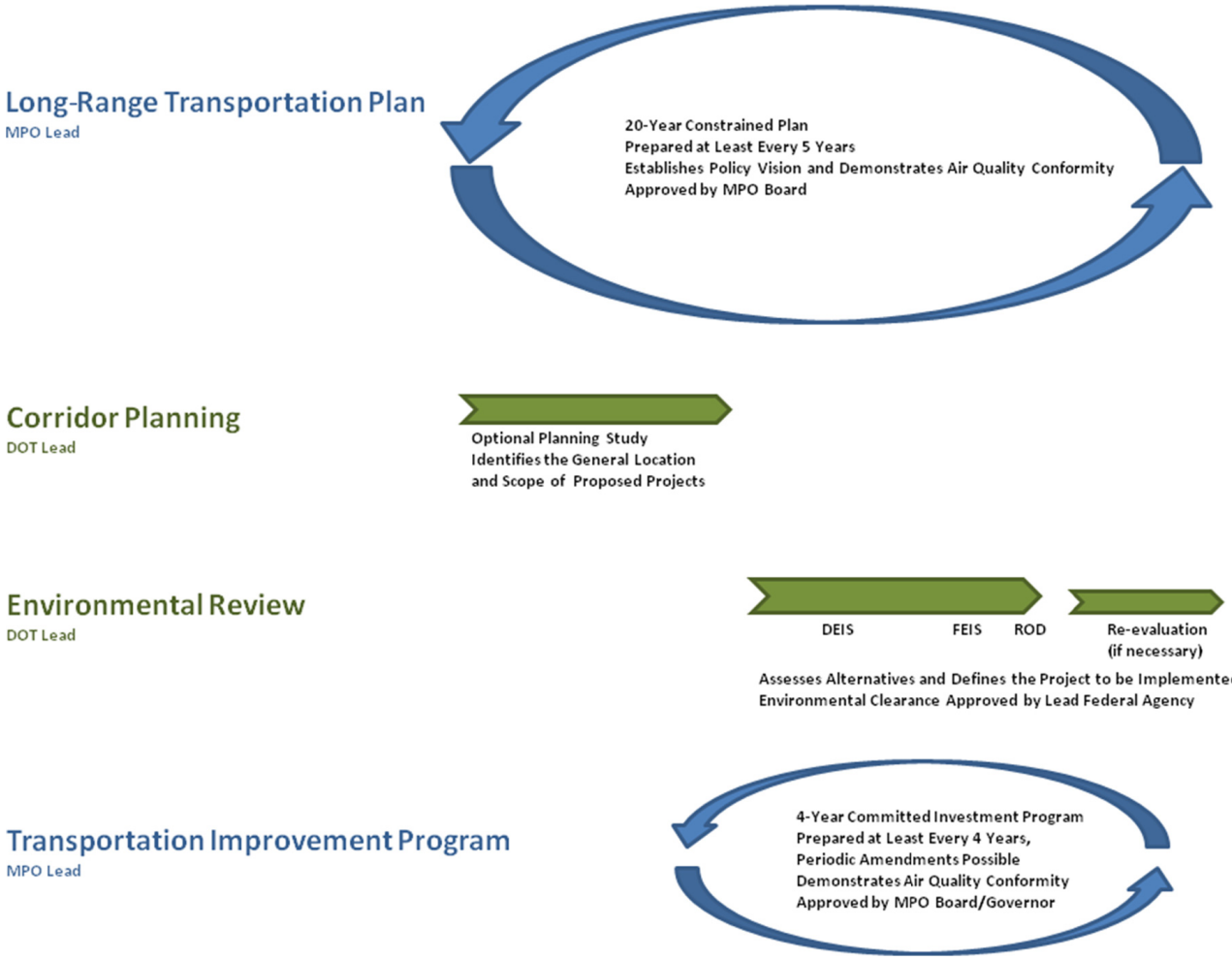
Alignment and Coordination with the MPO and NEPA Processes

The interaction of the Decision Guide processes with P3 procurements may also introduce challenges to the implementation of P3 projects. The issue here is primarily one of timing and coordination, and it pertains to P3 and traditional procurements alike. The scope of a highway project is generally refined through the NEPA process. NEPA may optionally be preceded by the more general corridor planning process to help define basic locations and extents of alternatives. The details of the scope are established through the NEPA process, including refining the alignments and cross sections of projects, as well as the locations and configurations of points of access and egress. The NEPA process also involves the conceptual design of any structures associated with highway improvements, such as major bridges or tunnels, overpasses and underpasses, and interchange ramps.

NEPA and its optional predecessor, corridor planning, are linear processes, as shown in Figure 4.1. NEPA occurs once for each project and culminates in a categorical exclusion, FONSI, or ROD, at which time project definitions are established, typically to the level of preliminary (30% or less) design. NEPA also requires interaction with the planning process, which was described in detail in Chapter 3. Figure 4.1 illustrates that by contrast to NEPA (and corridor planning), the MPO planning process is cyclical, involving the preparation of the short-range TIP and the long-range MTP.

Coordinating Inherently Different Processes and the Risk of Delay

The interplay of the NEPA and the planning processes requires close coordination, but the inherently different nature of these two requirements often causes delays. NEPA involves a series of fixed milestones as projects advance, each of which is a one-time event. The amount of time it takes to navigate NEPA varies based on the complexity of the analyses that need to be completed and the sensitivity of the issues being assessed. At the conclusion of the NEPA process, a preferred alternative is defined; however, final approvals can only be gained once the planning documents (MTP, TIP/STIP) and the P3 project in its final form are consistent. If the P3 project scope changes, delays may occur if the planning documents have to be revised. Although delay is accepted as part of the status quo and not



Source: Parsons Brinckerhoff.

Figure 4.1. Planning and environmental review processes.

generally monetized by sponsors of publicly procured projects, time is money to private project developers, and delays introduce the risk of cost increases due to inflation, changes in commodity prices, interest rate fluctuations, and longer periods of time before revenues become available to pay debt service. These risks pose serious challenges to private project developers who have fixed time frames for developing and operating projects and deriving a return on their investment. This is the primary reason that all private-sector P3 practitioners who were interviewed as part of the research effort underpinning SHRP 2 Project C12 generally stated that they far prefer to participate in post-NEPA P3 procurements.

To begin a project's environmental clearance with the use of federal funds, it must first be included in the region's MTP. In addition, NEPA and/or preliminary engineering costs must also be identified in the STIP/TIP. When the NEPA document is complete, it can only be approved if the project is consistent with the MTP and STIP/TIP. The challenge here is that the timing of the conclusion of NEPA and the completion of the STIP/TIP may not align. Projects are regularly included in the STIP/TIP while the environmental process is under way. However, if changes in the definition of a project occur (e.g., the location or configuration of ramps and interchanges or the number of travel lanes in a given segment), those changes need to be reflected in the links and nodes coded into the regional travel demand model that is used in the conformity analysis for the TIP. If the coding in the model is not 100% consistent with the final definition of the project, then the final approval of the project would have to wait until the conformity process is next updated before gaining final clearance. FHWA state division offices are responsible for issuing final environmental approvals for projects. There is a great deal of federal discipline involved in confirming that funding is in place and that the conformity analysis reflects the definition of projects accurately in both the MTP and the STIP/TIP.

This issue has presented concerns for several projects, including the LBJ Express project in Dallas, which had received environmental clearance some time before its P3 award was made. After the contract was awarded, the private partner identified numerous minor engineering enhancements that

would reduce costs and improve profit potential. However, it was not possible for the private partner simply to make changes and move on. Instead, the new design modifications had to go through the conformity process, which, as confirmed by the North Central Texas Council of Governments, took 18 months and involved 21 public meetings. A senior official with TxDOT also reiterated that the air quality conformity analysis has the longest cycle of all MPO activities, and noted that it is preferable to complete conformity reviews on an annual basis, although this may not be possible because of personnel resource constraints. MPOs in other regions, including TPB in Washington, D.C., do run conformity analyses on an annual basis and update the definition of the projects included in the process on a periodic basis as designs are refined. A senior official with TPB notes that the conformity review is not a "once and for all" process and that it is possible to minimize delays through good planning and collaboration and by accommodating schedules at both ends.

Accommodating Postdesign Refinements with P3 Projects

Identifying project design refinements is a hallmark of P3 projects. One of the primary benefits of P3 delivery is the innovation that private partners can bring to projects. P3 partners regularly seek out opportunities to streamline construction costs and to make modifications to project designs that may result in greater use and revenue levels. Successful P3 developers are also experts in toll highway operations and often are responsible for implementing projects defined by DOTs. Therefore, P3 partners are incentivized to conduct value engineering reviews to seek out opportunities to enhance project performance, streamline costs, and increase overall profitability. Coordination with the NEPA and MPO processes can be an impediment to private-sector creativity and innovation. In cases when projects have already gained environmental clearance, private partners forgo opportunities to innovate because the delays involved and the risk of gaining approval to move forward with them outweigh the benefits of innovation. This barrier to innovation is discussed further in Chapter 5 in the section on limitations with post-NEPA P3 procurement.

Overcoming Challenges and Achieving Public Acceptance

Favorable public opinion is essential with P3 projects because a lack of public support increases the risk that projects can cause various sorts of unanticipated delays. The risks and the levels of public opposition to a project have the potential to translate into higher financing costs. Projects that enjoy positive public anticipation, which can often be measured by positive media coverage, broad-based political support, and/or neighborhood/community redevelopment activity, can also expect to find similar support from funders.

The cultivation of public opinion and support for transportation projects typically begins as projects are defined in the early concept and planning stages. The public involvement process involves a number of different ways in which public agencies seek to inform and secure feedback from the public to ensure a workable degree of consensus in relation to their mission and proposed activities, to improve their policies and plans, and to increase public appreciation and trust. As it applies to transportation projects, this public involvement phase traditionally begins during the NEPA process. NEPA requirements provide opportunities for the public to learn about and provide comment on the pros and cons and especially provide an opportunity to present trade-offs associated with a project and its alternatives. Through this give-and-take process, a clear picture of public opinion of a project emerges, resulting in collective appreciation and consent for a project, or not.

Outreach Challenges with P3 Projects

High Visibility Transfer of Public Service Function

One of the challenges in gaining public acceptance for P3 procurements is that it involves the transfer of one of the most visible public service functions, the building and operating of highways, to the private sector. To gain support for this new model, project sponsors must bring the public on board with the concept throughout the process. Visibility is often heightened with P3 procurements, because they are often used on large, complex, and high-profile projects. As one MPO official observes, "All the easy projects have been built, so the level of controversy with P3 projects is just another issue on top of the rest." However, experience in the United States demonstrates that "people are generally aware of the concept of P3s, and as they have gotten better understanding of what is involved, they have become more accepting." This is particularly true once P3 projects become operational.

The involvement of a private-sector partner may initially draw mixed reaction from the public: some will applaud the potential efficiency, whereas others will be suspicious that the costs of the project will be inflated or the quality or construction, maintenance, or operation will be compromised to increase profits. It is difficult, or almost impossible, to separate the public's reaction to increased private-sector involvement from reaction to the introduction of tolls, especially in locations that do not have a tradition of tolling. Pushback from the general public regarding a potential P3 project does not focus on the private partner aspect, but rather the imposition of tolls as a method of paying for the infrastructure.

Double Taxation

Tolls introduce several outreach challenges. Members of the public often view tolling as a form of double taxation, and they

also fear that the control over toll rates will be given to a profit-motivated private investor, who will make money by taking advantage of motorists. With public toll facilities, revenue generated is used to pay for the ongoing maintenance and operation of the toll facility or other specified transportation needs. However, with toll P3 projects, a portion of the revenue not needed to pay operation and maintenance costs, debt service and the funding of required reserves, if any, is retained by the P3 partner as return on investment. Certain segments of the public may also fear that P3 procurements bring about a loss of public control over important public infrastructure and can find it distasteful that private investors are being allowed to profit by doing the government's job. These perceptions can be exacerbated if the P3 partner includes foreign investors. As one foreign P3 developer notes: "Public opinion is much more perception than reality with new projects. In the United States, there is a perception that the public is already paying for transportation. There is resistance to tolling. This dynamic is stronger when a P3 is involved and even stronger if the P3 project involves a foreign investor."

Confidentiality

An additional outreach challenge with P3 projects is that private developers may regard some aspects of their involvement as confidential or proprietary. Even a private developer participating in a predevelopment agreement may not wish to make key elements of its proposal public because it may have to compete for final transactions. This desire for confidentiality can be perceived as contrary to the spirit of NEPA, which is based on full disclosure and maximum transparency. Moreover, the need of the private partner for confidentiality can make the public wary of the process, with concern that the public project sponsor is trying to hide something about the project.

Differing Public and Private Motivations for Participating in P3s

Challenges associated with achieving public acceptance for P3s are rooted in the fact that public and private sectors have distinctive reasons for P3 participation, and with those reasons come dissimilar measures of success (KCI Technologies, Inc. 2005). At the heart of these differences is that government's values reflect a responsibility to uphold and protect public interest, whereas private-sector motivators are distinctly profit-driven.

Government agencies choose P3 arrangement for a variety of reasons, including

- To avoid an increase in the bonded indebtedness of a state.
- To construct new highway facilities with minimal initial public investment.
- To reduce cost of a new highway to the general taxpayers.
- To gain access to new funding sources for highway construction, such as a tolls and local tax initiatives.
- To gain access to nontraditional finance sources, including commercial debt and private capital.
- To enhance production resources for the delivery, operation, and maintenance of major projects when internal staff resources are already operating at capacity.
- To save time in overall project delivery by streamlining the procurement process.
- To permit concurrent design, right-of-way acquisition, and construction activities in place of sequential completion of these activities.
- To promote private-sector creativity and innovation in project delivery.
- To permit a project to proceed as a whole, rather than in phased construction as is often required by state budgetary processes.

Private-sector partner motives for advancing the P3 relationship include

- To increase the number or size of highway construction projects in production.
- To operate highways as long-term, for-profit investments (typically through a tolling component).
- To direct or encourage development of properties in a given area through highway construction.
- To secure a long-term commitment to their team for design, construction maintenance, and operation of a large project.

Strategies for Gaining Public Support for P3 Projects

Agencies sponsoring P3 projects should anticipate having to address certain types of public concerns when implementing P3 projects. They should also recognize that there are many sound reasons to help garner public support for P3 procurement. These include

- Accelerated project implementation;
- Access to new sources of equity and finance;
- Enabling public transportation funding to be used for other needs; and
- Reduced life-cycle costs—capital construction and ongoing maintenance and operations—compared with traditional public procurement.

Project proponents and their partners should determine if any negative opinion is based on specific project elements or if there are policies that can be modified. Project sponsors should explore any opportunities for modifications, and, similarly, should ascertain whether negative opinion is be based on a lack of or inaccurate information, and should take steps to remedy any such conditions. Finally, project proponents should also identify other public investments and policies currently under

way within a community that may lend insight about how to mitigate public opinion.

Public outreach for highway improvements is required by NEPA, and the state of practice is well documented in many different sources. The rest of this section identifies several issues that are likely to be incurred for gaining support for highway projects involving tolling and the use of P3 procurements.

Public Support Begins with Policy Support

Crafting and attaining approval of policies that support tolling as a method to help pay for transportation projects is the first and essential step in gaining public support. Although tolling can be used on traditionally procured projects, it is an essential component of most P3 projects. Therefore, even P3 infrastructure executives believe that early on in the project development process, it is best to limit the project funding discussion to tolling in general and to not cloud the issue with discussion of P3s. In the words of one executive: "Early P3 discussion can spook people, and this can be destructive." Another executive hopes that the outreach and education directed at elected officials and policy makers can instill an understanding that P3 procurements are not a funding option, but rather a financing option, and that this understanding can dispel the misconception that "P3's are magic."

The fundamental benefit of P3 delivery is that it can be an effective way to develop large and complex projects because it aligns the interests of the sponsor and the P3 partners with the needs of a community. As an MPO staffer at the North Central Texas Council of Governments in the Dallas–Fort Worth region observes,

> Our analyses and outreach efforts do an excellent job of identifying negative aspects of projects. However, we do not do a good job of identifying and selling the benefits of projects. The benefit of tolling and P3 procurements is that they are the lynchpin that allows us to advance projects that would not otherwise be able to be built. This is an enormous benefit.
>
> We need a new outcome-driven mindset that intertwines private involvement in the project development process. The outcome should be first and foremost. This culture is colliding with the slow and deliberate traditional public development process.

One private developer echoes the "outcome-driven" approach with P3 projects, observing that "traditionally, public agencies are more focused on funding, whereas the private sector has a special interest in reducing costs. The reality is that streamlining costs is just as important as finding funding."

Because policy is crafted by elected officials and their designees, the advantages and disadvantages of tolling and the associated possibility of incorporating private partners in the delivery of projects are germane to policy discussion. As one MPO official observes,

> MPOs are all about regional policies and vision. If the need and purpose of a system is documented in a plan that has well defined policies—such as being able to sustain a regional roadway system—then there is a way to weave P3's into a loose definition of a transportation plan. This is over and above the specifics of a purpose and need statement—it is a regional vision.

One senior private developer lauds the government of Puerto Rico's efforts to gain public support for its multimodal P3 program, with outreach activities such as extensive radio, television, and print campaigns discussing the benefits of P3 delivery, including one of the most controversial P3 approaches: the monetization of an existing highway. As another private developer observes,

> Project sponsors need to establish a rational explanation for why they are considering P3s from the inception of the project development process. It's not easy and public agencies are not used to implementing P3 projects. But given the limitations on fuel tax revenues, they need to be an essential part of the discussion.

Outreach, P3s, and the Planning Process: Articulating the Discussion in Understandable Terms

MPOs are responsible for identifying and evaluating alternative transportation improvement options through the development of MTPs and TIPs, and also by involving the public and other affected constituencies in the development and maintenance of those plans. By definition, MPOs are at the forefront of the regional dialogue regarding the importance, and, perhaps even the necessity, of tolling vital transportation projects. MPOs are also charged with developing policies that support that financing option. Those involved in metropolitan transportation planning are charged with talking to stakeholders about critical issues facing their region and providing opportunities for stakeholders to contribute ideas and offer input. According to one MPO official,

> It is appropriate for a region to look at which projects in its plan would lend themselves well to P3 development. The planning process involves a lot of public outreach, so it is also possible to ask the community about their views on possible P3 development and get helpful feedback. This would provide the region with guidance on whether tolled alternatives should be included in environmental analysis.

TIPs and STIPs must be updated every 4 years (and can be revised or amended between update cycles), so there are continual opportunities to discuss tolling as one way to supplement more traditional sources of revenue to ensure that projects

contained within the TIP and STIP are built. Inasmuch as a region's TIP is approved by both the MPO and a governor, the ultimate inclusion of tolling as a potential financing option carries with it at least tacit support of the governor in office. A DOT official observes,

> If the MPO process explores the possible implementation of P3 procurements [and tolling], it enables all involved stakeholders to see what kind of support there is for this approach. If these different possibilities are debated during the planning process, then in the end, the DOT and their stakeholders will know what is feasible.

It is important for the transportation planning process to be fully disclosed to the public about the funding. For example, if there is only $200 million in public funding available for a much larger project, then that story needs to be told to help the public understand the connection between the available funding and the overall cost required for a project to "make the case" for tolling (and consequently, in some cases, for P3 projects). Funding needs should be discussed early and often as a simple matter of disclosure to the public.

If the policy rationale supporting tolling can be articulated in terms that the general public can readily and easily understand, then the use of tolling and P3 procurements stand a better chance of being accepted when the policy is applied to a specific—and real—project. For example, one rationale might be to simply provide a supplemental revenue source to enable a project to be built sooner than it would be without such funding. Another rationale might be to provide the ability to manage demand on one (or more) corridors to ensure mobility. Policy objectives must be clearly articulated and justified for both decision makers and the public for a tolling project to be accepted.

Important Influence of Local Policies on the Use of Tolling and P3 Procurements

In Texas, the use of tolling has been codified by both state and regional policies that require all new highway capacity to be considered for tolling. Local MPO officials in Dallas–Fort Worth recalled that up until 2 years ago, FHWA would require environmental documents for highway expansions to include nontolled and tolled alternatives. However, FHWA now allows NEPA documents in Texas to include only tolled alternatives because, as one TxDOT official put it: "Given the Texas Transportation Commission's policy of tolling new highway capacity, nontolled alternatives are not realistic."

This example illustrates how policies can affect tolling acceptability as a project moves into the NEPA process. Additionally, understanding and acceptance of toll policies may help to alleviate fear among private operators worried about failing to recover any up-front costs associated with early involvement. Nonetheless, even when policies that support tolling as a financing element are in place, it appears that the consensus among both public officials and the private sector is that, from a public outreach perspective, it is advisable to wait until NEPA is near completion and tolling is deemed the desired form of paying for a substantial portion of the project before pursuing the project as a P3 opportunity. In some cases, however, there are good reasons not to wait until the completion of NEPA (or near completion) to address tolling, as discussed in Chapter 5.

As one MPO official explains, "Investors are not interested until there is an actual project that has been defined and has secured environmental approvals, permits and right-of-way." As an FHWA official concurs, observing,

> With P3 projects, most private entities do not want to be involved with projects during the NEPA process because of all the risks. As a result P3 procurements are generally put out after NEPA is completed. However, prior to that project sponsors hire financial analysts who evaluate projects for their financial potential.

Even as a state advances its preferred alternative through the NEPA process, most private firms begin developing their thoughts on how to optimize the project by reducing costs, improving operational characteristics, and increasing revenue. This allows greater understanding of opportunities and risks as the NEPA process draws to a close and a record of decision is on the horizon.

As little as 10 years ago, the internal objective and approach by many private companies was to look for ways to innovate by submitting unsolicited offers. That strategy, however, has lost much appeal, as private firms have become enmeshed in protracted and expensive environmental or political processes. Time is money, and the NEPA process does not enjoy a reputation for swift and uncomplicated completion.

Perception that Private Involvement Predetermines Outcomes

A fundamental tenet of the environmental process is that it must remain objective until a final or preferred alternative is identified. Suspicion that a private developer has the opportunity to bias the outcome to make a profit makes the NEPA process untenable to any resource agencies, elected officials, or the general public. Although FHWA has issued guidance that does not allow private involvement in the definition of a NEPA project, the current consensus seems to be that it is generally desirable to involve private partners only close to, and immediately following, the completion of a NEPA record of decision, with some exceptions (see further discussion in Chapter 5 on the timing of P3 procurement decision). Additionally, if agencies want private involvement, they may

provide potential partners with an opportunity to comment on project design on an informal basis. If P3 procurement is going to be considered, it is helpful to keep the NEPA document as flexible as possible to enable private partners to look for ways to deliver the project as cost-effective as possible, without having to revisit the NEPA approval to incorporate the resulting innovations into the project. In the words of one infrastructure firm executive: "Public agencies should learn to stop design at the point when they gain environmental approvals. Then there are opportunities to innovate."

That is not to say, however, that consideration of tolls as a project revenue source should not be part of the NEPA evaluation. In fact, opinion is quite the opposite. One MPO official stresses that "If you wait until a record of decision has been obtained to consider the possibility of tolls, a reevaluation would be necessary, and reevaluations should be avoided whenever possible." Through the NEPA process, the public and corridor stakeholders can be introduced to the project-specific advantages tolling may offer for the facility. NEPA's open process allows and encourages people from all walks of life to ask questions, weigh the benefits and disadvantages, and perhaps alter their attitudes and opinions about a project.

Although tolling cannot be included in a NEPA purpose and need statement, arbitrarily, it should and, in fact, must be included when there is a planning basis for doing so. Resolutions that recognize tolling, the policies that support them, and the plans that articulate them cannot be adopted without an open and concerted public vetting process.

CHAPTER 5

Timing and Implementation of P3 Projects

This chapter examines the temporal evolution of the transportation planning and project environmental review process in the context of implementing—or potentially implementing—P3 projects. Given the different time frames in which these processes unfold (linear for NEPA and cyclical for MPO requirements) and their close interrelation, it is essential to understand when and how P3 procurements should be considered as projects develop. In addition, as was discussed in Chapter 3, P3s and other nontraditional project delivery mechanisms raise additional legal, regulatory, and financial considerations within the planning and NEPA processes.

Chapter 5 explores these issues and represents the crux of the research conducted in SHRP 2 Project C12. The chapter contains three sections. The first section introduces the distinction between contemplating the possibility of using P3 delivery and the actual decision to move forward on a P3 basis and the important idea that the decision can be made at any time after completion of the NEPA process. The key distinction here is the ability to modify projects to make them financially viable, because P3 procurement is more limited and cumbersome after NEPA completion. However, given the risks and uncertainties associated with P3 procurements, an increasingly large number of potential private development partners do not want to become involved with projects until they have actually been defined and NEPA is complete. The chapter continues with a discussion of the pros and cons of considering P3 before or during NEPA. It also provides a parallel assessment of issues that arise when procuring the P3 following NEPA.

P3 Consideration Versus P3 Procurement Decision

There is a significant distinction between the decision to use a P3 when implementing a project and the consideration of using P3 delivery. An underlying premise of the Decision Guide is that the transportation planning and environmental review processes can be parsed into discrete decision points. Initially, the research envisioned for this project was conducted with the expectation of examining and adapting these decision points for P3s. As the research progressed, it was revealed that ascertaining the precise juncture at which the decision is made to implement a project on a P3 basis is less significant than is the extent to which deliberate consideration is given to P3 delivery and where that consideration occurs within the Decision Guide processes.

The research has determined that those projects that involve early consideration stand the greatest chance of being successful. Similarly, assessing a set of projects on a programmatic basis may reveal the best candidate projects for P3 implementation. It should be noted that the P3 market in the United States is still young, with relatively few projects to evaluate and from which to draw generalized conclusions. Even those projects perceived as successful may not have come about through calculated consideration (as described further throughout this chapter and in Chapter 6), but this research extrapolates from those experiences. It captures the ongoing progress of P3 practitioners, who are learning from experience and developing new processes to advance future P3s through better informed and formalized processes.

In addition, the definition of "success" is malleable. In some cases, reaching financial close may be the definition of success if a short-term perspective is taken; in other cases, success may depend on defining it either from the public partner's standpoint or the private partner's standpoint. Project success for the public sector might be measured by the ability to have delivered the project sooner than anticipated without a P3 or by the ability to implement additional projects with funds not spent on the P3 project. A private partner is likely to measure success by return on investment or the ability to secure future work. Both public and private partners may also rely on positive measures of customer satisfaction or the achievement of operational objectives to quantify project success.

Potential benefits can be captured and risks minimized by considering the possible use of P3 delivery throughout the Decision Guide processes. The decision to commit to a P3 to deliver a project still can be made at any time during the planning and environmental review steps. The decision may also be made once these steps are completed. However, when the possibility of using P3 procurements has been considered throughout the planning and NEPA processes, it can result in a more informed ultimate decision whether to use a P3 and produce greater assurance that the challenges associated with implementing P3s (as identified in Chapter 4) can be overcome. As described later in this chapter, considering the possibility of using P3 procurements throughout the processes also reduces the risk that additional NEPA or planning processes will be required.

A Decision to Procure a P3 Can Be Made at any Time

Optimally, the decision to advance a transportation improvement as a P3 should not be made separately from the transportation planning and environmental review processes embodied in the Decision Guide. However, there is no one point within the development/environmental study phase of a project at which a public owner must make a decision to procure a contract with a private entity. The decision can be made at nearly any point within the phases of the project development cycle.

Although federal statutes and regulations, as described in Chapter 3, permit public owners to enter into contracts with private entities before completing the NEPA process, this approach is not frequently used. The common approach is to issue P3 procurements for projects that have already cleared all necessary environmental approvals. When P3 procurements are awarded before completion of the environmental review process, the private partner plays a supporting role in the public sponsor's definition of the alternatives assessed in the environmental approval process.

Some projects may even use both models. For example, for the North Tarrant Express project, the TxDOT was interested in developing a project with multiple segments, only a few of which had already been approved under NEPA. After an evaluation of the available alternatives, the department decided to select a single private entity to develop the entire project, splitting its work into two separate agreements: a toll concession agreement for the project segments that were ready for design and construction and a predevelopment agreement for those segments that still needed environmental approval or otherwise were not ready for development. For other projects, such as FDOT's I-595 Corridor Roadway Improvements Project, where there was no advantage to bringing in a private entity to help define the project, the procuring agency completed the NEPA process before starting the P3 procurement process.

The decision to advance a project as a P3, whether before or after the conclusion of NEPA, entails both positive and negative considerations, as discussed in the following sections.

P3 Procurement Decision Before or During NEPA

The decision to use a P3 approach to implement a transportation improvement project before the conclusion of the NEPA process has met with both successful and less than successful results. This section discusses the pros and cons of implementing P3 before or during NEPA.

Conditions and Reasons for Early Private-Sector Involvement

Certain decision-making environments and conditions during the early phases of project development may lend themselves to pursuing P3 procurement before the conclusion of the NEPA process or even before the start of environmental review.

Unsolicited Proposals

The simplest case to consider is that of an unsolicited proposal, which can take the form of a project that is entirely new to the sponsoring agency or may be one that was already being contemplated. An environmental review of the proposed project in an unsolicited proposal may not already have started, or could already be under way, and the concept in such an unsolicited proposal could introduce a new or modified alternative to the NEPA process.

The best example of this scenario is the unsolicited proposal for the Capital Beltway HOT Lanes, submitted to VDOT shortly after the department released a draft environmental impact statement (DEIS) evaluating alternatives for HOV widening and for interchange improvements along the Beltway corridor in Northern Virginia. By necessity, the NEPA process was kept separate from the development of the P3 proposal and the contractual relationship established with the private partner once the proposal was accepted. Nonetheless, the unsolicited proposal concept was considered among the alternatives as they were being refined in the final environmental impact statement (FEIS), and the proposal was eventually selected as the preferred alternative. It is not possible to know what would have happened in the absence of the unsolicited proposal before the final NEPA decision, but it is certainly possible that this large and complex project might still be on the shelf today, or different in significant ways from the project actually being implemented. One interviewee familiar with the project remarked that the prospect of waiting until the completion of the Beltway's EIS before addressing the possibility of

P3 implementation "might have killed the project." The private sector was the catalyst for making a project—with DEIS alternatives that were not feasible from a political perspective, much less a financial one—possible.

A project that has undergone a challenging period of early development and whose outcome remains to be firmly determined as this research concludes is also located in Northern Virginia. In this case, the I-95 HOT Lanes project began as an unsolicited, pre-NEPA proposal in October 2003. VDOT solicited competing proposals in early 2004 and made an award later that year. The project was envisioned to expand an existing HOV system on I-395 and I-95 from two to three lanes and to convert it to HOT use along a 28-mile segment from near the Pentagon south to Dumfries. The project would also add new construction HOT lanes extending 10 miles further south to Stafford. In 2006, FHWA found that the southern portion of the project could be cleared with an environmental assessment (EA), whereas the northern portion not involving construction of new lanes could fall under a categorical exclusion (CE). However, Arlington County objected to the proposed new capacity by restriping the existing HOV lanes along I-395, and that portion of the project was ultimately removed. The revised I-95 HOT Lanes project, which now extended further south to Spotsylvania, received a FONSI from FHWA in December 2011. The ultimate implementation of the HOT lanes will require further negotiation between VDOT and its private partner, because the omission of the I-395 segment of the project will result in far lower toll proceeds.

Private-Sector Innovation

Aside from the case of an unsolicited proposal, public sponsors have additional reasons to begin P3 procurement or otherwise involve the private sector before the conclusion of the NEPA process. To determine whether to involve a private entity before completing the NEPA process, public owners should consider whether the project has the following characteristics:

- Flexibility to define and refine the project alternatives;
- Good potential for financial feasibility; and
- Desire for private-sector input and innovation to define and accelerate an optimally feasible project.

Advantages of considering implementation of a project as a P3 before final NEPA approval derive from these characteristics. Key among them is the benefit to the project brought by private-sector innovation. The ability of a private partner to play a role in the definition of alternatives—and ultimately a preferred alternative—can ensure that the partner's design, constructability, and facility operations expertise are incorporated, likely yielding a better project outcome than would be produced by the public sector on its own. It is expected that the private partner brings to the equation business experience working in a diverse set of project environments and approaches project details from a life-cycle cost standpoint, both advantages that help optimize alternatives development, similar to a value engineering exercise. One public-sector practitioner interviewed described P3s as "value engineering on steroids."

For example, future segments of the North Tarrant Express in Fort Worth, Texas, are being implemented through a predevelopment agreement. The construction of a critical connection between one interstate contemplated for improvement with another near downtown Fort Worth was identified by the private partner because it made sense from operational and financial perspectives to include as part of the project. This private partner was particularly keen on identifying these longer term efficiencies because it would be responsible for operating the facility over a multidecade concession period, striving to achieve facility operational objectives and a target return on investment.

This example also illustrates a second advantage to early private partner involvement: the ability to incorporate suggested design changes into the environmental process before issuance of a final decision. In this way, any impacts from the design modification and necessary mitigation are addressed up front, minimizing the need for more costly and time-consuming reevaluations, as well as expediting overall project implementation post-NEPA. In addition, as noted by one interviewee, early involvement offers the opportunity for the private partner to gain an appreciation for federal processes and ways to navigate them from the more experienced public sponsor, theoretically reducing the risk of delay.

Financial Feasibility

An early decision to use a P3 also rests on a preliminary understanding of project financial feasibility. A P3 project must have a dedicated source of revenue to compensate the private partner for its participation in the project and provide a return on its investment. The project sponsor must also be confident that a financing package can be assembled to leverage project revenues before proceeding with early P3 procurements. In addition, the earlier that the public is aware of how a project will be paid for, especially one that involves tolling and the private sector, the greater the opportunity to educate and build support for the proposal.

Informal Early Involvement

A public sponsor may obtain input from the private sector before the conclusion of the NEPA process without having made the decision to definitively procure the project as a P3. Soliciting industry insight and input can take place through requests for information, special forums, one-on-one meetings,

or other more informal channels. Indeed, some private-sector interviewees indicated their preference for interacting with public sponsors on an informal basis, eschewing more formal arrangements or commitments (e.g., predevelopment agreements, a discussion of which follows) to a potential P3 project until after environmental clearance.

Formalizing the Private Partner's Role through Predevelopment Agreements

A definitive P3 procurement decision may be made before conclusion of NEPA and the role of a private partner formalized through what is often known as a predevelopment agreement (PDA). A small but growing number of DOTs, including those of California, North Carolina, Georgia, Texas, and Oregon, have used this approach, in which the private partner is responsible for teaming with the sponsoring agency in the definition of P3 projects. A PDA approach involves input from private partners in the environmental process with the hope of arriving at a preferred alternative that reflects technological innovation and which will be less costly to implement and operate. The PDA typically involves the private partner's participation in the preliminary design of the project during the environmental review process, at either a reduced or deferred cost, contingent on gaining the right of first refusal to develop the project on a DBOM or DBFOM basis. The public-sector sponsor remains responsible for completing the environmental review process but has the benefits of extensive input and technical support from the private partner.

PDA arrangements are generally let as best-value procurements, with proposers judged on their technical qualifications and concepts and proposed plan of finance. The procurement may also request unit costs for implementing different types of construction. The actual negotiation of the concession and construction agreements does not take place until after the preferred alternative is determined, although many of the fundamental risk transfer provisions are usually contracted in the PDA itself. As a result, using a PDA requires a trade-off between the benefits to be gained during the development stage and the necessity to maintain competitive tension on concession terms. The actual construction price could be determined by a competitive procurement, but more frequently the private partner's team includes a design-builder, in which case the design–build price would be determined through an open-book process, subject to audit and federal review.

During the PDA process, the developer acts as a consultant to the public sponsor, and the public sponsor retains control over the development process and the choice of the preferred alternative. Once the PDA advances into the implementation phase, the delivery method can take the form of any P3 model or the project can be developed through a traditional competitive procurement (in which case the developer would be compensated for professional services provided, based on preagreed payment).

Limitations with Pre-NEPA Approval P3 Procurement

Despite the benefits of early P3 involvement, there is also a downside to involving the private sector in helping shape or manage the development of projects before completing NEPA analysis. These limitations include the selection of a private partner from a less-competitive environment, concern for private-sector influence (perceived or otherwise) on the selection of a preferred alternative, and potential private-sector management of an environmental review process that raises several issues. For example, private-sector management of this process might create precedents that the public sector does not want to create and it might also raise questions about the extent to which management of such processes can be delegated to a nongovernmental entity.

Limited Private-Sector Interest and Less Competition

As was discussed in Chapter 2 in the section on the evolution of U.S. P3 highway procurements, P3 application in the United States has evolved over a relatively short period of time, from projects that have involved the private sector during or even before the start of the NEPA process to a private-sector preference for projects with in-place environmental approvals. Indeed, several private-sector firms interviewed stated as much; their business strategy is to seek P3 opportunities that are demonstrably robust in public desire and overall development. These requirements typically imply clearing the significant hurdle of obtaining environmental approval, thus signifying the project has been vetted through opportunities for public comment and is cleared for further federal action, including securing federal funding or financial assistance and gaining final design approval. In addition, private partners are hesitant to participate in a project without sufficiently developed information on its costs, without which an informed decision cannot be made on whether the opportunity represents a promising and feasible investment.

Nonetheless, some interviewees left open the possibility for involvement before the conclusion of NEPA under the right circumstances. One private-sector partner indicated the preference to become involved before completion of the environmental process so that their own design innovations may be incorporated into the preferred alternative being analyzed, thereby minimizing post-NEPA risk of revisiting environmental impacts or being limited in design flexibility.

Public-sector perceptions support this idea of a private-sector preference for involvement in potential P3 opportunities only post-NEPA. However, the private sector's actual willingness to pursue a P3 project in the absence of environmental clearance may be greater than some public-sector officials may believe. The mindset of private firms is nearly always oriented toward a profitable opportunity if the circumstances are right. Through experience, public-sector agencies have adopted a conservative stance on gauging what the private sector demands of the P3 arena. This dynamic may lead to a continued reduction in willingness to consider unsolicited proposals and an increased attempt to control the selection and development of P3 projects through environmental review and preliminary design, before formally soliciting a private-sector partner.

Nonetheless, limited private-sector interest in preenvironmental clearance project involvement or engaging in a PDA naturally reduces the field of potential private partners from which a public-sector sponsor can draw. A reduced field of interested participants means less competition. There are generally fewer competing proposals, fewer cost comparisons, and a smaller number of alternative technical concepts. There emerges the need to weigh the trade-off then between fostering an environment for innovation before NEPA's conclusion and potentially restricting the number of parties willing to participate that would add competitive value.

Concern for Private-Sector Influence on Preferred Alternative Selection

NEPA facilitates project planning and decision making that considers environmental values alongside technical and economic considerations (Council on Environmental Quality 2012). The process is designed to be an unbiased framework in which to evaluate reasonable project alternatives in response to a proposed action while minimizing or avoiding harmful impacts to the environment. The development of a project's purpose and need statement and project alternatives is designed to be a collaborative process and not intended to be influenced by any one individual or stakeholder's preference or opportunity to benefit over another. Therefore, project sponsors maintain a real desire and put forth a great effort to "maintain the independence of NEPA."

There exists skepticism among the public and other stakeholders that selection of a preferred alternative or its characteristics, especially its proposed means of finance and operation (as in the case of a toll road) can represent an unfair prioritization of the private partner's financial gain over the best value to the public or fulfillment of need. More than one agency interviewed remarked that P3 consideration during the environmental review process may cause public concern for undue influence on the project's location and design decisions and risks "prejudging the outcome," regardless of whether the project's development has relied on formal engagement of the private sector. Adding the formal input of a private partner to this scenario only exacerbates this impression.

Private Sector Is Not Well Positioned to Manage the Environmental Process

As noted in Chapter 2, federal regulations prohibit private entities from preparing a NEPA document or from having any decision making responsibility in the process. Control and execution of the NEPA process is an intergovernmental collaboration among the federal lead agency and joint lead agencies, who prepare the document; participating agencies, who have an identified stake in the alternatives contemplated and help shape them; and additional cooperating agencies that have jurisdiction by law or special expertise regarding potential environmental impacts, many of which issue permits required for project construction.

The involvement of private-sector entities is limited to producing studies, providing information related to the environmental process, or, more generally, providing viewpoints of key project-related issues. Thus, the private sector cannot have any direct involvement in decision-making aspects of the NEPA process, such as drawing conclusions about the extent to which mitigation reduces impacts. This limited level of involvement makes it challenging to advance the development of a project for which a private entity has ultimate responsibility to design, construct, and operate in a manner that satisfies the public sponsor's requirements, but which also achieves an appropriate, worthwhile return on investment. Depending on the specific working environment of the public agencies involved, the private sector may not even be privy to certain decisions made during the environmental process, such as key project characteristics, or operating scenarios to be modeled, or being allowed to offer input at significant junctures. Public participants must maintain not only the reality of an impartial weighing of alternatives and outcomes but also the unquestioned perception of this reality.

Earlier resource agency involvement can help to establish the expectations for addressing or avoiding impacts and formulating mitigation. In addition, issues that may arise during permitting can be resolved during NEPA instead, with the active and early involvement of resource agencies. Doing so can reduce the risk of unforeseen issues that can arise during the permitting process and that can pose obstacles to private involvement or result in the need for public subsidies to address them. The lack of available resource agency staff to review and provide early input early in the project development process—for P3 and non-P3 projects alike—was cited as a common roadblock in achieving this outcome.

Many state DOTs have adopted NEPA/404 Integration Memoranda of Understanding (MOUs) to address these issues and streamline the process for subsequent U.S. Corps of Engineers Clean Water Act Section 404 permits and Endangered Species Act consultation. The concept of these integration MOUs is to bring the resource agencies into the process early on and to reach concurrence with them at key points in the process, such as determining alternatives to be evaluated and determining which alternative is the "least environmentally damaging practicable alternative." Several states have found that integration MOUs do not always work as well as hoped and that MOUs have not always been effective tools to reduce processing time, as expected.

Procuring the P3 Following NEPA

One of the greatest unknowns in implementing transportation improvements is the time frame for gaining environmental approvals. The environmental review and approval process usually involves many agencies and extensive public entities. During the course of the review process, the scope can change substantially. Any litigation seeking to stop a project from going forward can also arise at this stage of project development. Thus, the possibility of extensive project revisions and long delays is greatest during this time. Moreover, delay in obtaining necessary approvals not only imposes its own costs but also can adversely impact budgets owing to cost escalation incurred as a result of delay. These risks can be greatly minimized by waiting until obtainment of environmental clearance for a P3 project. In addition, potential private-sector bidders are likely to avoid pursuing P3 projects that have not received environmental approvals, unless the project agreements include a mechanism allowing them to recoup costs associated with changes in scope and delays arising out of the environmental process.

This general sentiment reflecting a preference in the private sector for P3 opportunities with NEPA clearance was expressed by most of the individuals interviewed for this research, as discussed earlier in this chapter. Because a majority of industry participants operate with this strategy, the competitive environment is also greatest when conducting a P3 procurement post-NEPA. Public sponsors will have a greater field from which to select a best-value proposal, capitalizing on competition to drive down cost and potentially promoting technical innovation. However, engendering innovation in a post-NEPA environment depends on the private sector's appetite for accepting the risk of potentially needing additional environmental approvals (as discussed in the next section). It is important that the project design process be paused at the appropriate level during NEPA so the flexibility to innovate remains intact.

Incorporating innovation into a P3 project's design post-NEPA also depends on whether a preferred partner has already been selected from among a group of prospective bidders. Before the award of a development agreement, the competitive environment motivates bidders to offer alternative technical concepts that may deviate from the request for proposals (RFP), typically with the requirement that they must be "equal to or better than" the original requirements of the contract documents. Once a successful bidder is selected, the private partner is more likely to want to reserve design innovations for later use in bidding for future jobs (Papernik and Farkas 2009). Unless the design change offers the private partner an operational advantage over the life of the concession or otherwise increases its return on investment, the private partner may be reluctant to propose it.

Limitations with Post-NEPA P3 Procurement

The primary drawback of waiting until environmental clearance to procure a project on a P3 basis is foregoing the advantages that are associated with early involvement, as discussed earlier in this chapter. The drawbacks include a more constrained environment for project innovation, greater risk that innovation may trigger environmental reevaluations, and less opportunity to build public awareness and support for a P3 approach.

Barriers to Innovation

Although the prospects of a competitive environment increase when soliciting a P3 after environmental clearance, they can be counterbalanced to some extent by a reduction in the ability to capitalize on private-sector innovation. When private partners become involved in the project development late in the NEPA process, many of the opportunities to refine the design or scope of a project may become limited, and opportunities can become even more limited if the environmental review process has already been completed. After a ROD or FONSI, opportunities to solicit alternatives from P3 developers still exist but are subject to constraints, thereby reducing the level of creativity.

The procurement process typically allows bidders to propose alternative technical concepts, but usually the RFP imposes constraints such as requiring that the alternatives remain within the confines of the ROD and be limited to small changes in alignment or footprint that do not trigger additional NEPA or planning processing. A private partner's willingness to offer an alternative technical concept may also depend on how the risk of additional environmental analysis is allocated. Private partners may be more encouraged to propose an alternative technical concept if the public sector accepts the risk.

Need for Reevaluations or Supplemental Environmental Review

As described above, there is a strong risk that post-NEPA modifications to design concepts may precipitate a reevaluation of an environmental approval. This is a disadvantage to deferring the selection of a P3 partner until after the completion of environmental review. Experience with the development of the LBJ Express (north of Dallas) illustrates this phenomenon. There, the prospect of a reevaluation limited the implementation of design and consequent operational efficiencies in the project's development. The TxDOT's private partner identified a modification to an interchange along the LBJ Freeway corridor, which was undergoing reconstruction and widening with priced managed lanes, as an area that would produce a project benefit in excess of its implementation cost by a factor of 2.5. This design modification, however, would have required a reevaluation, thereby halting all construction around the area of improvement and consuming an indeterminate amount of time, possibly many months. When the estimated time loss and risk was determined to far outweigh the benefit derived, the private partner chose not to implement the modification and the project lost this significant efficiency.

The public sector has a much higher tolerance for accepting the risk of a reevaluation than do private developers because the public sector does not operate within the same financial confines. In the private sector, even a short delay in a private partner's implementation schedule can have significant deleterious effects on its business performance. Private partners have little tolerance for long project gestation periods and delays due to reevaluation because they must operate within a time-constrained environment when arranging project financing and therefore consider the opportunity costs of committing excessive resources to a particular project.

However, failure to consider the possibility of P3 project delivery or the probable need for tolling until after NEPA presents even greater challenges. When this is the case, P3 procurement and toll financing introduce a new approach to the traditional means of delivering and paying for projects and can likely trigger environmental reevaluation and introduce formidable public outreach and acceptance issues. For example, tolling a roadway can necessitate reexamining air quality impacts, social equity, and environmental justice. Operational changes due to tolling may also require re-analysis of design modifications. These may include lane configuration, interchange locations, and the placement of toll equipment (e.g., gantries and toll booths). There is the real risk that any of these changes will take several months (for a revised EA) or more than one year (for a supplemental EIS). In some circumstances, it may be possible to demonstrate that tolling does not increase impacts, but additional modeling and analysis may be needed to allow this finding to be made. This need to return to an earlier state of the project development process after P3 project delivery or tolling is proposed has been referred to as the "chutes and ladders" phenomenon.

The Louisville-Southern Indiana Ohio River Bridges project is a notable example of this phenomenon. This bistate project improves cross-river mobility constraints by expanding bridge capacity in the Louisville, Kentucky, metropolitan region. A multi-year EIS process concluded with a ROD in 2003. After the ROD was issued, project design and financial planning progressed, culminating in a cost estimate in excess of $4 billion in an initial financial plan approved by the FHWA in 2008. The financial plan assumed the project would be fully paid for by traditional federal and state resources. However, it later became clear that traditional transportation funding alone would be insufficient to complete the project within a reasonable time frame, so additional tolling and alternative (P3) project delivery mechanisms were proposed.

The high cost of the project and new potential for tolling prompted considerable political and public pushback, leading to the governors of Kentucky and Indiana to call for a reexamination of the project's design. Several significant cost-saving modifications were proposed, along with tolling, requiring a supplemental EIS that was completed in 2012 after another year of environmental review, adding to a NEPA process that dated back to 1998. In addition, the challenge of general public disapproval of tolling and skepticism for alternative project delivery (never an insignificant matter) was further magnified by introducing the concepts late in the process.

Insufficient Public Awareness

Chapter 4 addressed the importance of careful and ongoing public outreach and awareness-building to build support for private-sector involvement in delivering transportation improvements and the related use of tolling. The window of opportunity to nurture this process and to build a critical level of understanding and support is more limited when P3 procurements occur after completion of NEPA analysis. The NEPA process sets public expectations on the configuration of the facilities to be built and how they will be operated. This is especially true if a decision is made post-NEPA to toll projects or to use P3 delivery. In the case of such timing, the ability to overcome public skepticism or outright disapproval becomes all the more challenging.

These problems arise in part because the public has come to see the NEPA process as the stage in the project development process where the debate occurs about whether and how the project should be built. If the possibility of using P3 delivery is not discussed in the NEPA document, there may be considerable public backlash if the project sponsor later decides to introduce P3 project delivery, even if use of P3

procurement does not affect the environmental impacts of the project.

The Ohio River Bridges project introduced above illustrates this situation. The public, community stakeholders, and some local lawmakers voiced strong opposition to tolling when in 2009 it became a real possibility to finance the project with a very large price tag, 6 years after the completion of NEPA. The project is moving ahead only now with significant cost-saving design measures in place, a lower price tag, and substantial state program contributions to keep toll rates as low as possible.

A similar situation arose with the development of the TxDOT's Sam Rayburn Tollway project, north of Dallas County. In this case, the TxDOT gained environmental clearance for the roadway, purchased the right-of-way, and planned to build the road as a conventional highway project, even beginning construction on the westernmost segments of the 26-mile corridor. Later, the TxDOT revisited its funding plans and decided to implement the project as a P3 toll road. This was a move that generated significant backlash within the local community. Despite being located in a region experienced with toll roads, the reaction to the late introduction of tolling and private involvement was unfavorable, as the public held strong expectations for a free road. As a result of the local community backlash, the TxDOT rescinded its decision to award the concession to a private partner and instead entered into an agreement with the Dallas region's local toll authority, which ultimately submitted a later and more expensive bid.

Thus, even if the private sector is not involved in the NEPA process, the fact that a project is likely to be procured as a P3 should be made clear in the NEPA document and public involvement activities should be conducted as part of the NEPA process, even when the conditions of P3 procurement have no bearing on the environmental impact of the project.

CHAPTER 6

Encouraging and Facilitating Early Consideration of P3s

The first five chapters of this report presented the findings of the research conducted for SHRP 2 Project C12. Chapter 6 interprets these findings to identify steps that may be taken to advance the state of the practice while considering P3s within the context of the existing planning and environmental review processes, which are largely fixed and codified. The sections that follow present strategies that arose in the research team's discussions with both public-sector and private-sector P3 practitioners throughout the United States. These strategies include

- Introducing tolling and alternative funding, together with the possibility of P3 procurements, during NEPA and the state and regional planning processes.
- Aligning project definition with revenue potential and available funding.
- Managing NEPA and other strategies to afford greater flexibility and speed.

These strategies and suggestions are also supported by proof of application gained from the research.

The chapter begins with an examination of how toll revenue and finance as well as the use of P3s might be considered during state and regional planning. The chapter then discusses carrying these considerations into the NEPA evaluation on a project-specific basis and examines issues concerning alignment of project definition with revenue potential and available funding. Several recommendations are made to build flexibility into the NEPA process, as well as post-NEPA, to facilitate the possibility of procuring a project on a P3 basis. The chapter concludes with an overall recommendation for enhancing the Decision Guide to consider the potential for P3 development.

Incorporating Tolling and P3s in State and Regional Planning

Systematic consideration of P3s and the revenue sources often used to help finance them (especially tolling) begins with state and regional planning activities. The interview findings support the idea that such consideration, however, should begin simply with alternative funding and financing strategies. P3 consideration can come at a later point, which may or may not occur during the long-range planning phase of the Decision Guide. Advantage may be gained by addressing the feasibility of tolling to support projects, in terms of both finance and public acceptance, before addressing the feasibility of P3s. In some states and under certain circumstances, equating tolls with P3s only complicates the challenges with establishing tolling as a viable, standalone strategy. It should be noted that there are different forms of P3s and alternative delivery mechanisms that do not involve tolling (see Chapter 2). If this approach is adopted and further analysis points toward a possible P3 procurement, the feasibility of tolling as a revenue source will already have been assessed. In addition, consideration of both tolling and P3 delivery may occur during the planning process if complementary regional or state policies are in place.

Considering Tolling and P3s During the Planning Process

The revenue sources included in most long-range plans reflect transportation funding patterns in the United States and rely on relatively conservative assumptions to achieve a level of certainty and predictability. The use of P3 procurements is rarely considered in long-range planning, because P3 projects with standalone financing require their own dedicated revenue sources. These dedicated revenue sources and the associated financing tools are not known with great certainty until much later in a project's development process, and often not until an agreement has been reached with a private partner and project financing is being arranged. Nonetheless, P3s can be a better integrated and viable option for project delivery if revenue sources most commonly associated with P3s (including tolls) are considered more systematically during the planning process.

General opposition to tolling often inhibits the consideration of tolls and P3 procurements during the long-range planning

process. In this regard, while tolls are the most common revenue source used for P3 projects, they are only charged in a limited number of metropolitan areas around the country. Moreover, the use of tolling is a sensitive subject that is often considered to be "off the table" in many regions. If an area has no previous history of tolling or P3s, it is not clear that use of tolling can even be counted toward an area's fiscally constrained financial plan because of a lack of precedent. As described in Chapter 3, toll revenue, private equity, or other funding sources associated with P3 project implementation must be identified in fiscally constrained planning documents (the MTP and TIP/STIP). They must also meet FHWA's test of "reasonably expected to be available," or in the case of nonattainment and maintenance areas, the more strict requirement of "available" or "committed" for the first 2 years of a TIP and STIP. For toll revenue or other revenue associated with a P3 to count toward fiscal constraint, FHWA requires clear evidence of previous use or support from an appropriate decision-making body, such as a state legislature.

Early P3 consideration is often difficult to obtain simply because some states still do not have legislation allowing P3 procurement and also due to the high level of uncertainty about the components of P3 financing. Sponsoring agencies would be well advised to consider P3s and tolling despite these inhibiting factors, keeping in mind that a primary purpose of long-range plans is to establish regional transportation goals and policies to direct future project development, as described in the next section. Indeed, long-range planning and regional transportation policies are mutually supportive: the long-range planning process can develop regional policies supportive of tolling and P3s, and regional policies can help guide future transportation planning to better incorporate the financial considerations of toll roads and P3 development.

Achieving this goal may require modifications to the long-range planning process to directly explore possible use of alternative revenue sources and the use of innovative procurement approaches, which could provide new sources of capital and financing. This requires adopting a more flexible view of available resources. In the absence of reform to federal requirements, regional and state policies offer avenues to achieving improved access to funding sources.

Developing Regional or State Policies

One method to facilitate the consideration of P3s and tolling during the planning process is through development of regional or state policies that encourage such consideration. This approach allows the public sector to

- Establish a framework for public education and debate to raise the level of understanding for transportation needs and those that can be met with P3s.
- Establish a precedent for P3 consideration to build the evidence needed to support fiscal constraint with toll or P3-related revenue.
- Shape a planning process to help narrow the range of feasible alternatives to be considered during NEPA, including those that require support from tolls or other nontraditional funding sources, in addition to including such information in a purpose and need statement (see the section on incorporating tolling and other alternative funding into purpose and need statements).

NCTCOG, the MPO in the Dallas–Fort Worth region, provides a prime example of an agency that has adopted a regional policy on tolling to help accomplish the three objectives, as identified above. It should be noted that NCTCOG's regional toll policy is not intended to dictate the application or even mandate consideration of P3s but rather to recognize the reality that traditional transportation funding available to the region is insufficient to meet mobility needs.

NCTCOG Sets an Example

Among a broader set of regional policies, NCTCOG has established 13 policies that guide its development of roadways in the Dallas–Fort Worth region. According to NCTCOG's 2011 guidelines, the two most significant policies to the development of toll roads (and, by extension, to the development of P3s) are evaluation of all new limited-access capacity for priced facility potential and maximization of the use of available funds where reasonable, priced facilities are developed with minimal or no federal and state funding assistance.

These policies date back to the 1990s and were put in place as a means to manage congestion, to generate needed revenue, and to minimize the amount of public funds required to implement projects. The policies predate state statutory authority to procure projects on a P3 basis, which itself has undergone several rounds of modification since its full inception in 2003 and is now legislated on a project-specific basis. Shortly after the state's P3 authorization passed, the Texas Transportation Commission mandated that all statewide controlled-access mobility projects in any phase of development or construction must be evaluated for tolling.

NCTCOG has used its policies pertaining to regional toll road development as a framework for its MTP. An NCTCOG official remarked that the 2035 MTP contains $6 billion in expected revenues generated from projects that will be priced, including both traditional toll roads and priced managed lanes. The funding needed to build these projects is assumed to come from these toll proceeds and, in fact, if the proposed roadway improvements are not tolled, they will not be built. NCTCOG staff interviewed for this research point out that with these policies in place, a vision for a sustainable, regional roadway

network is relying in part on toll roads and, to an extent, on P3s, and such financing is generally accepted by the public, stakeholders, and potential private partners. It is important to note that fiscal constraint has also been demonstrated.

Taking the case project a step further, toll roads in the NCTCOG region are seen not simply as roads that pay for themselves but rather as roads that have broader implications, as the money they generate is used throughout the region to optimize financing for additional improvements. That is, these facilities are an integral component to a regional plan of finance. This approach is supported by an NCTCOG policy on excess toll revenue from nonmanaged lane facilities, whereby the revenue is allocated at the county level to fund projects selected on a cooperative basis among NCTCOG, TxDOT, cities, and counties.

NCTCOG also maintains a flexible relationship with other transportation agencies in North Texas. A senior TxDOT official reported that in 2011, the department had a new project that it wanted to get into the new MTP in Dallas. At the time, TxDOT had several projects in the old planning process and had obtained NCTCOG agreement to include the latest project if TxDOT could demonstrate within 6 months that the environmental impacts of its projects already in the plan could be addressed with FONSIs. In the end, TxDOT succeeded in obtaining FONSIs for three of the five projects, and NCTCOG then incorporated those projects into the MTP, removing the other two.

Other regions are beginning to examine NCTCOG's model. Officials at the agency receive inquiries monthly from other agencies in Anchorage, Austin, Kansas City, Phoenix, and San Antonio, among others, about how to incorporate toll projects into financially constrained plans.

Policies Must Be Supported and Complementary with Others

Adopting a policy that prioritizes tolled or priced roadway expansion does not ensure that P3s will be considered, because both the Atlanta and the San Diego metropolitan regional projects have demonstrated. Support for P3s throughout all levels of government, as well as complementary and compatible policies on the use of toll revenue, are also necessary for P3 implementation.

In June 2007, Georgia's state transportation board adopted a resolution stating that all new capacity within limited-access corridors in the Atlanta metropolitan region would be managed, including HOV lanes, HOT lanes, and express toll lanes. Two years later, the Atlanta Regional Managed Lane System Plan (MLSP) was established to implement this policy, and P3s are an integral part of the plan's development and are included in its financial feasibility analysis as an option assumed to be available for project delivery. The implementation strategy for the MLSP (HNTB Corporation 2010) also discusses linking the plan to the region's MTP and ultimately to project-specific NEPA analyses—important considerations that are discussed in the next section:

> The document is envisioned as a source for projects to be added to [the Atlanta Regional Council's] MTP and the adoption of "special funding sources" (tolls and public–private financing), which together rely on the continuity of system-wide managed lane tolling. Analysis conducted as part of the system plan is also expected to form the basis for alternative evaluation in specific corridor NEPA studies. The cost of the managed lanes and the anticipated private funding required should be incorporated into the need and purpose of the NEPA document. The costs of the MLSP as part of a fiscally constrained TIP should demonstrate the amount of investment of public and private funds and help to build public understanding and trust.

Nonetheless, as the section on strategies for gaining public support for P3 projects in Chapter 4 summarized, as of 2012, the P3 approach in Georgia has been curtailed at the state's executive level, indicating that a regional toll policy is not necessarily the definitive avenue to P3 implementation.

In addition, regional policies at the metropolitan level may support tolls or pricing on roadway expansion, but to be readily feasible, the policies must be consistent with the expected characteristics of P3 procurements to qualify private-sector involvement. For example, the San Diego Association of Governments (SANDAG) leads the development of a regional network of HOT lanes, but its board has established a policy requiring application of any excess revenue from the operations of a HOT lane to support transit operations within the same corridor. This regional policy discourages consideration of P3 development, because funds retained by the private sector are not available for transit operations.

Washington State's legislative requirements make P3 development of highways highly unlikely. A full P3 procurement in Washington State requires separate legislative approvals for both tolling and the P3 procurement on a project-by-project basis. The legislature has also established other requirements that would apply to any P3 projects: the most notable is that any financings associated with P3 projects must be issued as public debt. One senior WSDOT official describes these requirements as a "P3 poison pill," and, as a result, the department is focused on nonhighway P3 opportunities, such as the implementation of privately financed fast-charge facilities along I-5 for electric vehicles and the possible redevelopment of ferry terminals. The DOT official also was quick to point out that policies in other states and countries can take an opposite approach to P3 development, noting that in British Columbia and Ontario, for example, any transportation project over $50 million must be evaluated for implementation on a P3 basis.

Incorporating Tolling and Other Alternative Funding in NEPA

Consideration of tolling and other alternative funding sources to be used to finance a P3 should continue into the NEPA process on a project-specific basis. Indeed, incorporation of funding sources into statements of purpose and need and subsequent alternatives analyses (as suggested, for example, in the case of Atlanta's MLSP) are permitted and encouraged through federal regulation and guidance on linking the planning and environmental review processes. Nonetheless, challenges remain to establishing this approach as standard practice. Although a project may be implemented through a P3, it may not have to be addressed within an EIS because that determination is based on a project's level of impact and mitigation (and not by financing). There are significant advantages to taking this approach, both because it increases public awareness and anticipates potential issues that are peculiar to tolled or P3 projects that might otherwise raise questions later in a project's development.

Incorporating Tolling and Other Alternative Funding into Purpose and Need Statements

According to Council on Environmental Quality regulations (40 C.F.R. § 1502.13), an environmental document's purpose and need statement "shall briefly specify the underlying purpose and need to which the agency is responding in proposing the alternatives including the proposed action." The statement must clearly express the objectives that the proposed action is designed to achieve by making a transportation improvement. According to 23 C.F.R. § pt. 450, Appendix A, such objectives may include

a. Achieving a transportation objective identified in an applicable statewide or metropolitan transportation plan;
b. Supporting land use, economic development, or growth objectives established in applicable federal, state, local, or tribal plans; and
c. Serving national defense, national security, or other national objectives, as established in federal laws, plans, or policies.

The lead agency (in the case of a highway project, typically FHWA and often a state or a local transportation agency) is responsible for development; in the case of an EIS or EA (as distinct from a CE), the lead agency must consider input from other agencies and the public.

The transportation planning process is an appropriate and encouraged source for a project's purpose and need statement. Planning regulations in 23 C.F.R. § pt. 450 allow documents or source material produced during the planning process to be incorporated directly or by reference into an NEPA document. Appendix A to 23 C.F.R. § pt. 450 (Linking the Transportation and NEPA Processes), which is nonregulatory, describes how the transportation planning process can be used to develop a project's purpose and need statement:

a. Goals and objectives from the transportation planning process may be part of a project's purpose and need statement.
b. A general travel corridor or general mode or modes (e.g., highway, transit, or highway/transit combination) resulting from planning analyses may be part of a project's purpose and need statement.
c. If the financial plan for a metropolitan transportation plan indicates that funding for a specific project will require special funding sources (e.g., tolls or public–private financing), such information may be included in the purpose and need statement.
d. The results of analyses from management systems (e.g., congestion, pavement, bridge, and/or safety) may shape the purpose and need statement.

In particular, Item (c) is the relevant bridge between the consideration of toll and other alternative funding sources during the long-range planning and policy development processes described in the beginning of this chapter and their continued consideration and evolution during the NEPA process, specific to a single transportation improvement. Federal regulation also stipulates that the "use of these planning-level goals and choices must be appropriately explained during NEPA scoping and in the NEPA document."

Alternative funding sources, such as tolls, are often critical to successful private-sector involvement in a P3. Carrying their consideration forward from long-range planning into NEPA positions a public sponsor to make a decision on procuring a project on a P3 basis at the juncture it deems most appropriate. In this manner project financing, including from the private sector, can be evaluated among the alternatives considered in the NEPA document, as discussed in the next section.

Incorporating Tolling and Other Alternative Funding into NEPA Alternatives Analyses

After the development of a project's purpose and need, the lead agencies are responsible for developing the range of project alternatives. An alternatives analysis develops, evaluates, and eliminates potential alternatives based on the project's purpose and need and allows the public to understand what options are available to the project's sponsor to satisfy the stated objectives (Center for Environmental Excellence 2012).

A full range of alternatives must be considered, but this does not mean every potential alternative need be included. Appendix A to 23 C.F.R. § pt. 450 lists the nonregulatory ways

in which the transportation planning process can eliminate alternatives through a project's purpose and need:

1. The transportation planning process has selected a general travel corridor as best addressing identified transportation problems, and the rationale for the determination in the planning document is reflected in the purpose and need statement of the subsequent NEPA document.
2. The transportation planning process has selected a general mode (e.g., highway, transit, or a highway/transit combination) that accomplishes its goals and objectives, and these documented determinations are reflected in the purpose and need statement of the subsequent NEPA document.
3. The transportation planning process determines that the project needs to be funded by tolls or other nontraditional funding sources for the long-range transportation plan to be fiscally constrained or identifies goals and objectives that can only be met by toll roads or other nontraditional funding sources and that determination of those goals and objectives is reflected in the purpose and need statements of the subsequent NEPA document.

These provisions are similar to those permitted when linking the development of purpose and need to the planning process. As per Item 3, if the long-range planning process confirms the need for tolls or other alternative funding to meet fiscal constraint and the plan's objectives (as reflected in the purpose and need) can only be met under such a scenario, alternatives, without tolls or without the provision for alternative funding sources, do not need to be considered in the NEPA analysis. The legal basis for this provision was articulated in a 2004 FHWA chief counsel memorandum responding to an inquiry from the Colorado DOT (FHWA 2004). Specifically, the memorandum concludes,

> If the need for a toll road comes out of the transportation planning process, then tolling could be included as part of the purpose and need statement for an environmental analysis under NEPA. Absent these circumstances, specific goals and objectives of a project, such as the urgency of the project or the need to relieve congestion, could narrow the range of reasonable alternatives to only toll road alternatives. Finally, the economic feasibility of a particular alternative, especially when considered in conjunction with other factors, might provide the basis for eliminating that alternative as unreasonable.

Even so, the memorandum acknowledges and cautions against the potential public challenges that must be faced when proposing a toll road: "In circumstance where a public controversy exists regarding the use of tolls on a road, it may be advisable, even though not required, to examine nontoll alternatives in the NEPA document so as to help avoid future litigation." Nonetheless, regardless of the funding strategy, an FHWA chief counsel white paper on alternatives analysis emphasizes the importance of using "sound project cost estimation methods during screening to eliminate alternatives that are not economically feasible . . . lead agencies cannot make a determination about an alternative's economic feasibility without supporting cost estimates and an analysis of likely revenue (funding) sources" (FHWA 2010).

When conducting an EIS, the lead agencies must provide opportunities for participating agency and public involvement in developing project alternatives and must consider the input provided by these groups. The opportunity for involvement may occur through "public workshops or meetings, solicitations of verbal or written input, conference calls, postings on web sites, distribution of printed materials, or any other involvement technique or medium" (FHWA 2006).

The development of the project's purpose and need and range of alternatives with participating agency and public input builds awareness and consensus for the use of tolls or an alternative funding source and for the possibility of implementing the project as a P3. This process of project finance consideration can continue through the evaluation of the selected alternatives in terms of their environmental impacts and options for mitigation and on through the selection of a preferred alternative. This allows public sponsors to mitigate unanticipated backlash and the potential for succumbing to the "chutes and ladders" phenomenon of needing to revisit environmental or financial analysis resulting from insufficient consideration or preparation during earlier planning and NEPA activities. Nonetheless, challenges remain when examining this approach in practice.

Challenges with a Tolling Focus During Planning and NEPA

Despite federal regulatory provisions concerning incorporation of tolls and private financing into project purpose and need and NEPA alternatives, there has been limited experience in practice to judge the success of a systematic application of this strategy. The Dallas–Fort Worth Metroplex experience, introduced earlier, illustrates that even in a progressive region where NCTCOG has been at the forefront of mandatorily considering toll road options for new limited-access highway capacity—as well as using P3s to implement some of these projects—focusing on toll road options during NEPA has not been without its challenges.

Those interviewed at NCTCOG indicated that they have worked diligently over the past 10 years or so with the FHWA Texas Division Office to apply its mandatory toll road consideration policy to NEPA documents. The Texas Division Office tends to take a conservative approach to approving purpose and need and alternative analysis strategies that narrow the focus of a project to a particular (and often potentially

more controversial) means of implementation, in this case, for example, one that uses tolls. The office's position is one that directly correlates to public perception, which, given the public's opportunity for involvement in NEPA, naturally affects the kinds of alternatives they prefer to see.

Over time and with the experience of five or six large highway projects, NCTCOG and the local TxDOT districts have been able to gain acceptance from the Division Office to eliminate nontolled alternatives from consideration, an achievement that only occurred in 2009 despite the basis established in FHWA's 2004 legal determination previously referenced. The challenge was that the application of tolling is often perceived as an effort simply to raise revenue. This challenge slowly had to be overcome, and again, the Division Office's decision was heavily influenced by public opinion. Through this evolutionary process, which included capitalizing on complementary and favored policies on toll rate setting and revenue distribution, NCTCOG has identified purpose and need objectives potentially leading to P3 implementation with greater public buy-in, building flexibility into the NEPA process to allow a P3 option if it emerges as the most feasible. Even without a single mile of priced managed lane capacity yet open at the time of this research's completion (much of which is being implemented through DBFOM or design–build procurements), NCTCOG staff highlights that a level of public trust has been built, such that project planning and development continues in the region for additional priced roadway capacity with private-sector involvement.

Environmental Impact Statements

The level of public scrutiny, skepticism, and often controversy with P3s, as well as the fact that they are most often applied to projects of significant need, cost, and complexity, may mean that a P3 project would be subject to an EIS rather than to a lesser class of action, such as an EA or even a CE. This is particularly the case when a P3 is proposed for a new facility, rather than for an expansion or operational change of an existing facility. If it appears that the project may not require an EIS, an EA would be prepared to determine whether an EIS is required. In fact, there may be merit in proceeding under the assumption that an EIS is necessary for a P3 and, specifically, for one that incorporates private-sector financing (e.g., DBF and DBFOM). The decision about the type of NEPA document to be used to clear projects is ultimately made by the project sponsor and federal lead agencies.

The FHWA Environmental Review Toolkit (FHWA 2012d) states that an environmental impact statement "is a full disclosure document that details the process through which a transportation project was developed, includes consideration of a range of reasonable alternatives, analyzes the potential impacts resulting from the alternatives, and demonstrates compliance with other applicable environmental laws and executive orders." An alternatives analysis to determine the "range of reasonable alternatives" is more rigorous for an EIS than for an EA, as summarized in the FHWA office of the chief counsel's white paper on alternatives analysis, as cited earlier (FHWA 2010). The white paper states: "In cases involving EA/FONSIs, some courts have found the obligation to consider alternatives to be less than that required for an EIS, and consequently have allowed agencies to study a more limited range of alternatives, including the use of so-called 'Build/No-Build' or 'Project/No-Project' analyses." In using a Build/No-Build EA where only one alternative is compared against taking no action, only a "brief discussion of other alternatives considered and the basis for rejecting them during the scoping process" is required. The advantage of an EIS is that it requires comprehensive and rigorous analysis and agency coordination. The downside is that EISs are usually both resource-intensive and time-intensive.

Agency and public involvement for an EA is also less encompassing than it is for an EIS. The SAFETEA-LU established a revised process when conducting an EIS for highway projects that "requires a new public comment process on purpose and need and the range of alternatives, encourages more participation from more agencies and organizations, and defines more formal roles for state, local and tribal agencies in the process." (FHWA 2012e; 23 U.S.C. § 139). An EA is not subject to this heightened level of agency and public involvement; EAs do not require participating agencies, for example, federal and nonfederal agencies that may have an interest in the project (23 U.S.C. § 139d) to be invited, nor do EAs require involvement of cooperating agencies, those that have "jurisdiction by law or special expertise" regarding the proposed action (40 C.F.R. § 1508.5). (The glossary in Appendix A lists a further definition for these types of agencies.) Additionally, in its summary of FHWA regulations found in 23 C.F.R. pt. 771, the FHWA Environmental Review Toolkit states: "EAs do not need to be circulated but they must be made available to the public through notices of availability in local, state, or regional clearinghouses, newspapers and other means. Depending on the FHWA-approved state public involvement procedures, a public hearing may or may not be required" (FHWA 2012f). Overall, the involvement of interested or affected federal and nonfederal agencies and the public is far more rigorous and prescribed for an EIS than for an EA.

If the level of agency and public involvement required of an EIS is not reproduced in some fashion for an EA, the opportunity may be missed to uncover potentially problematic public acceptance issues. With a potential P3 project, these aspects especially include those associated with private involvement or operation, including tolling and toll rate setting.

The I-95/I-395 HOT lanes project in Northern Virginia may offer a related example. As was mentioned in Chapter 5, the I-95 HOT Lanes, a DBFOM P3 project, no longer includes improvements to I-395 inside the Capital Beltway. Arlington County objected to expanding the managed lane capacity along I-395, seeing little merit in doing so in a dense urban environment. Instead, they advocated for dedicating any expanded right-of-way to buses. They filed a lawsuit challenging the commonwealth's decision to clear that portion of the project using a categorical exclusion, claiming insufficient environmental analysis had been conducted. Interviews conducted for this research indicate there are those who believe that if a full EIS process had been conducted for the project, rather than using a CE and EA in combination, this outcome could have been avoided. An EIS would have provided a platform for vetting and mitigating the issues raised by Arlington County.

Aligning Project Definition with Revenue Potential and Available Funding

Despite the requirement for MPOs and state DOTs to develop financial plans and demonstrate fiscal constraint on MTPs, TIPs, and STIPs in order to gain fiscal clearance, some projects receive environmental clearance and then languish due to lack of funding and the recognition that regional priorities may not justify their expense given other needs. When such situations arise, projects either are not built or they are altered to become financially feasible. This may involve breaking them into smaller pieces, scaling back the scope of the project, or introducing tolling. As was described in Chapter 5, the alteration of projects is likely to require the NEPA process to be reopened. This invariably leads to delays and also subjects projects to the vagaries of inflation, changes in commodity costs, and to public skepticism.

As a senior TxDOT official responsible for the implementation of P3 projects observes,

> There is never enough money. In order to develop a NEPA footprint that aligns with the P3 process, you need a realistic project. TxDOT was introduced to P3 development with the LBJ Managed Lane project in Dallas. As it was preparing for the procurement, the private sector asked for clarity on three fundamental issues:
>
> 1. What is the scope of the project?
> 2. How will the project be procured?
> 3. How will the private partner be paid—project revenue, up-front subsidy, or subsidy over time?
>
> These questions took TxDOT back to the environmental analysis because they needed to modify the scope of the project to align with the financial resources—both public and private—that were expected to be available.

As this experience demonstrates, one of the most important findings from the research is the need to identify and address the challenge posed by funding gaps early on, and then to use the Decision Guide processes to vet the different options to advance projects. This approach is more common in the public toll road sector where revenue potential is assessed up front. This involves forecasting future cash flows and determining what level of debt they would be able to support. Once this is known, design can be developed that adheres to the revenues the project will be able to generate and, in cases where this is not possible, the additional level of public subsidy needed to move into implementation can be identified. Private investors use this same general approach when assessing whether to pursue potential P3 opportunities. The sections that follow describe how the Decision Guide could be adapted and how to use the planning and NEPA processes to introduce these analyses earlier in the development of highway improvement projects.

Assessing Revenue Potential

Whenever tolls are considered as a revenue source for new highway improvement projects, there is the obvious question about how much money can be generated. Traditional four-step travel demand forecast models and the newer generation of activity based models are used regularly to generate toll revenue forecasts. However, these modeling tools may need to be adapted to be used in regions that do not have existing toll roads. Toll revenue forecasts are prepared at several different levels of resolution, with initial feasibility studies often relying on standard assumptions on the value of time and pricing elasticities that are derived from data collected on existing toll facilities. However, more detailed analyses require an increasingly nuanced understanding of the local context and often extensive survey efforts.

MPOs in regions that have not considered tolling or P3 procurements in the past should consider enhancing their modeling tools to be able to study the possible use of tolling. Travel demand and toll revenue forecasting models are the subject of numerous SHRP 2 and NCHRP studies, which provide excellent information on the mechanics involved. In particular, the NCHRP 08-57 publication *Improved Framework and Tools for Highway Pricing Decisions* provides extensive documentation on enhancements to travel demand models to evaluate both fixed and variably priced tolls (Parsons Brinckerhoff, Inc. 2009). SHRP 2 Project C04, Improving Our Understanding of How Highway Congestion and Pricing Affect Travel Demand, advances the state of the practice in modeling the effects of highway congestion and pricing on travelers' decisions, including the choices of facility, route, mode, and time of day. Model enhancements needed to do high-level conceptual analyses do not require extensive

resources to be put in place and can provide local decision makers with a basic understanding of the revenue generation potential of different highway improvement projects under consideration. These forecasts are an essential first step toward the facilitation of regional decision making on the potential of tolling for meeting local transportation investment needs.

Defining Reasonable Alternatives

NEPA requires that EISs consider "all reasonable alternatives" (23 C.F.R. § 771.123(c) and 40 C.F.R. § 1502.14). With highway projects, alternatives are defined by factors, including location and alignment, the number of lanes, the use of tolling, and operations strategies. Although the regulations do not specifically define the term "reasonable," it is generally understood to mean those technically and economically feasible project alternatives that would satisfy the primary objectives of the project as defined in the purpose and need statement (Council on Environmental Quality 1981).

Several factors drive the definition of highway improvements in NEPA. One of the most fundamental is the size of a highway improvement. This involves determining the number of lanes the facility will have and the width of the shoulder. In an EIS, this is driven by the purpose and need statement, which usually identifies the volume of traffic the facility, should be designed to serve. These figures involve future year volumes that are normally derived from forecasts. Project sponsors should scrutinize any traffic volume benchmarks included in purpose and need statements to assess their reasonableness. The cost of implementing highway projects is far too great to build projects that are larger than necessary or that are too small to serve the intended purpose and need. In addition, numerous regulations require that impacts be avoided or minimized. If a project is too large, consequent mitigation efforts may be more difficult and costly than necessary.

Design standards are the other major factor driving the cost of alternatives that emerge from NEPA analyses. FHWA requires highway projects that receive federal funding to be designed according to the standards set forth by AASHTO in its publication, *A Policy on Geometric Design of Highways and Streets,* commonly referred to as the "Green Book." Although the Green Book establishes standards for all parameters germane to highway design, it also includes exception procedures that allow certain elements of highway projects to be designed to less rigorous standards as a result of economic, physical, social, or environmental constraints. All design exceptions must be approved by FHWA, and exceptions are regularly allowed to avoid right-of-way takings or the reconstruction of existing overpasses or structures. Design exceptions may also be permitted to avoid excessive construction costs. Design exceptions are commonly associated with improvements to existing highways where rights-of-way are constrained.

The scaling of projects and the extent to which design exceptions are allowed have a significant impact on cost. It is not uncommon for EISs to identify a set of alternatives that are unnecessarily expensive. If this situation is not addressed through the review process, it may lead to projects gaining final environmental clearance but not being implemented because of prohibitive cost. The research has focused on two cases where overdesigned projects were advanced and then reconsidered. One of these is the Capital Beltway HOT Lanes. The March 2002 DEIS of VDOT assessed three HOV-widening alternatives, together with 15 interchange improvement concepts with significant property impacts. The alternatives would have required up to 170 acres of new right-of-way and the displacement of nearly 300 residences, impacts to 32 commercial properties, and impacts to eight Section 4(f) resources. The costs of the alternatives were also extremely high, ranging from $2.68 to $3.25 billion.

Many local governments and residents expressed concerns over the extent and scale of the project during the public comment period. However, before it had the chance to revisit the DEIS alternatives, VDOT received an unsolicited offer from a private developer who proposed to add four new HOT lanes working entirely within the existing right-of-way. The private proposal not only addressed the public's concerns with the invasive scale of the proposed alternatives but it also reduced the estimated cost of the project by approximately $1 billion (subsequent design refinements raised the project cost to $2.0 billion, which is still significantly less than the original estimate). Several design exceptions were needed to keep the Beltway widening within the existing right-of-way, but the review process was flexible enough to accommodate making the required modifications. In so doing, the cost of the project was significantly reduced, and with a $409 million subsidy from VDOT, it became possible to implement it on a real toll DBFOM P3 basis. VDOT's subsidy, however, has increased to over $500 million due to subsequent design changes.

The Ohio River Bridges is another major project that incurred significant delay as a result of being overdesigned. As described in Chapter 5, this project gained a ROD in 2003, but with an estimated cost of over $4.0 billion, the project did not advance. The excessive cost was driven by several design elements that proved excessive and unnecessary. These included a design for the East End Bridge and its access roads in both Kentucky and Indiana with six lanes, even though the existing highways they connected are only four lanes with no plans to expand them. Moreover, the entire length of the East End component of the project had full 12-foot shoulders, including the bridge itself and a 2,000-foot tunnel passing below a historic property in Kentucky. Initial plans for the Downtown Bridge called for it to have a 17-foot pedestrian/bicycle path, as well as 12-foot shoulders. Those plans also included relocating the Kennedy Interchange of

I-64, I-65 and I-71 in downtown Louisville to the south of its existing location at a cost of over $1.0 billion.

In the end, these design elements were revisited as part of a supplemental EIS. The design now reduces the East End Crossing to four lanes, removes the pedestrian/bicycle path from the Downtown Bridge, and reconstructs the Kennedy Interchange in place. These changes have reduced the cost of the project by nearly 43%. The crossings will be tolled and Kentucky will procure the new Downtown Bridge on a design–build basis while Indiana will implement the East End Bridge as an availability payment P3. Design consultants on the project questioned the need for the large scale of the initial concept, particularly the use of 12-foot shoulders on major bridges and a tunnel and providing six lanes on the East Bridge. They report that the FHWA division offices pushed back against their suggestions to reduce the scale of the project, arguing that the wide shoulders were necessary for safety purposes and the wider East End cross section was necessary to provide the desired levels of traffic service on the projects. In the end, the governors of Kentucky and Indiana interjected their collective opinion that the project was too large and established a bistate commission to arrive at a sustainable solution.

Assembling a Financial Plan

Financial plans are the nexus where project costs and expected outlays during construction are benchmarked against the revenue generation potential of a project, the debt that such revenue can leverage, and other available funding. As such, they are an operative tool for determining whether projects are actually affordable. Financial plans distribute the estimated cost of constructing projects based on the anticipated sequencing of construction activities and track when revenues being used for the project will be available, as well as any project debt. These inputs are then imported into a pro forma cash flow model that documents the amount of money needed on an annual or monthly basis throughout the implementation period. With P3 projects, cash flow models also extend throughout the concession period and consider expected toll proceeds, debt service, toll collection, and operational costs, as well as routine and major maintenance.

Cash flow models are essential tools in assessing the merits of different financing options and help private partners identify an optimal financing strategy. They are also an important tool for public agencies, enabling determination of the rate of construction that the annual available revenues will support. They also are essential in managing large construction programs that are often supported by dedicated revenues, including state and local sales tax or motor fuel tax measures. When procuring P3 projects, public agencies use the cash flow model to develop a base case against which the offers submitted by different proposers are gauged in public-sector comparator assessments.

Although the preparation of financial plans would be helpful in enabling project sponsors to determine if different alternatives are actually affordable, project-specific cash flow models and financial plans are not required as part of NEPA or the planning process. FHWA, however, requires that financial plans be prepared for all highway improvements receiving federal funding with implementation costs over $500 million. Although FHWA recommends preparation of an initial financial plan as early in the project development process as practical, it generally expects to receive an initial version of the plan either at the time a ROD is issued or before right-of-way acquisition. Final financial plans must be approved before federal-aid funding may be authorized for project construction. Financial plans are also required for projects receiving federal funding with costs over $100 million and below $500 million, but such plans do not need FHWA approval.

If project sponsors were to perform cash flow assessments for large and complex projects earlier in the project development process, they would be able to determine early on whether funding gaps exist. If this determination is made while projects are still in NEPA, then additional alternatives reducing capital costs or generating new revenues through tolling could also be assessed. Similarly, this type of analysis would help DOTs to determine if particular projects have the potential to be largely financed through toll revenues and would also enable them to identify those projects with the potential to be developed on a P3 basis.

Interestingly, the federal financial plan requirements caused several regions, including Louisville/Southern Indiana, to come to the realization that projects are unaffordable and either need to be rethought or possibly dropped. Several of those interviewed expressed frustration with FHWA's major project requirements; however, the sentiment was also expressed that the requirements do cause project sponsors to think about the fundamental underpinning of large projects. While adding additional steps to a complex and time-consuming process like NEPA has an obvious downside, there is merit to encouraging project sponsors to face the difficult question of project funding while projects are still being defined. Doing so earlier in the process would enable owners to assess the feasibility of projects and understand the interplay between streamlining costs and the ability to generate revenue. Doing so would also help owners identify projects that may be feasible to implement as P3s.

Managing the NEPA Process to Afford Greater Speed and Flexibility

Gaining environmental clearance for complex highway improvements is a challenging endeavor at best. The process is full of unknowns, from design challenges to unforeseen

existing conditions and public acceptance challenges, all of which have the potential to cause delays or require previously completed individual analyses to be revisited. This reality is even more challenging with P3 projects that may include the added element of tolling and require other ancillary studies outside NEPA to assess toll feasibility, prepare P3 procurement packages, and assess P3 offers (see Chapter 4).

Although the potential for delay is great, it can be managed with proactive up-front planning. This section describes numerous strategies that can be used to coordinate data needs within NEPA and the other analyses that go hand in hand with P3 procurements. In addition, it also discusses strategies to afford greater flexibility for future innovation by private partners after the completion of NEPA. Although undertaking the activities that follow may require additional time and cost on the part of project sponsors, it is a valuable investment as the information it provides will streamline the completion of NEPA and the other assessments that are needed to advance P3 projects. Moreover, the actions described also have the potential to reduce the likelihood that environmental reevaluations or supplemental EISs may be necessary after the completion of NEPA due to innovations identified by a private partner. A DOT considering the use of P3 procurements should identify the shortlist of projects with the potential for P3 development during the early stages of conceptual development. The strategies that follow should then be applied on a programmatic basis as those projects move through NEPA order to expedite the process and avoid the risk of revisiting earlier stages of the project planning and development process.

Local planners interviewed for the research believe that the risk of revisiting earlier analyses may also be avoided by making existing regulations more flexible. For example, if a legacy project with NEPA clearance is waiting for funding, the NEPA and MPO documents often need to be revisited before the project can be built. As staff from NCTCOG explain,

> While federal guidance may suggest that this is the case, it may not be needed. The rules could allow you to say that you are adding eight lanes. That could involve four general purpose lanes per direction, or three general purpose lanes and one managed lane. There is no need for protracted analysis if a little flexibility is afforded.

Nonetheless, NEPA requires the lead agency to determine whether a supplemental document is necessary based on operational details. In cases where additional analysis is not necessary, the agency still has to assess that possibility.

Identifying Data Needs Up Front

A great deal of up-front data gathering is required for an environmental evaluation. With potential P3 projects, the information gathering process should be expanded to include the additional data sets needed to assess future P3 potential and should ensure that the data emerging from the environmental review is consistent and suitable for use in various analyses. Project sponsors should ensure that the data can support considerations that might not need to be assessed in the absence of P3 development.

This is particularly true with traffic data, which is used to assess traffic, air quality, and noise impacts, among other issues. With toll projects, traffic forecasts are also used to estimate revenue generation potential and to test the ability of different toll rates needed to achieve desired operational and revenue generation goals. In many cases, extensive data collection and survey efforts are needed to enhance the ability of existing travel demand models used to assess the effects of pricing on driver behavior and revenue generation potential. Modeling can be done at different levels of resolution and it can be expected that non-NEPA traffic data needs will become more detailed as projects advance to procurement and financial close. Sponsors of P3 projects must coordinate closely with MPOs to identify traffic data needs up front and to consider the merits of collecting that information in one coordinated effort, rather than in piecemeal fashion as new needs become apparent.

Virginia's OTP3 takes what it refers to as a "programmatic and project-specific approach" to data collection for P3 projects. The process begins with a project-specific risk analysis to identify the greatest risks (e.g., geotechnical conditions, hazardous materials, cultural and historic resources) and then involves assessments that are similar to cost-benefit analyses. These assessments are used to compare the cost of collecting the information in question and the likelihood that the information will enable proposers to submit lower costs.

Project sponsors should also consider what data or studies produced during NEPA would help proposers develop a better understanding of risks as they prepare their proposals and also reduce the risk of reevaluations as a private partner finalizes project designs after the completion of NEPA. This strategy was reiterated by a Virginia OTP3 staffer: "If you are in the field collecting data, collecting a little more is relatively easy. The schedule and budget might discourage this, but in the end there is value to undertaking this additional effort, especially for projects that may be developed on a P3 basis."

For example, geotechnical risk is a common concern among potential private-sector partners as they consider P3 opportunities. If a P3 project involves underground risk, project sponsors might want to consider undertaking a more comprehensive set of soil borings than needed for NEPA purposes so that bidders have access to the information and can use the data to prepare more refined cost estimates. The only prudent approach for private partners in the absence of such data is to assume that issues may arise and to prepare for them by adjusting cost estimates upward to account for this possibility.

Study Areas in Environmental Documents

The interviews conducted for the SHRP 2 C12 study revealed that in certain situations, expansion of study areas in environmental documents for potential impacts may reduce schedule delays and enable greater design flexibility both during NEPA and afterward. This is particularly true for interchange locations, because their costs are often quite high and variable, depending on project configuration. In addition, operational improvements are often necessary at interchanges when tolls are introduced on facilities that were initially designed to be toll-free. As a result, P3 partners can be expected to focus value engineering efforts on strategies to reconfigure interchanges to reduce construction costs and improve operational characteristics.

If the analysis envelopes around interchange locations are not large enough to accommodate the review of different design options (e.g., if a compressed ramp configuration was assumed in an EIS, and later analysis indicated that a cloverleaf design may be more appropriate), additional baseline data may need to be collected. This has the potential to cause delay, particularly if the project sponsor does not have a contract in place for the data collection services. The baseline data are also helpful to private developers because they can develop their alternative designs to avoid sensitive areas, such as wetlands, which in turn might have the potential to limit the need for a reevaluation. The study area's existing conditions data are also essential to the lead agency responsible for overseeing the environmental process, because it helps them to determine whether the proposed changes would warrant a reevaluation.

VDOT has also taken an interesting approach in clearing the U.S. Route 460 Corridor Improvements Project, which would involve construction of a new 55-mile four-lane divided limited-access highway between Petersburg and Suffolk in Virginia's Tidewater area. The project is being constructed in an alignment through largely undeveloped land where, as OTP3 staff described, "the alternatives were literally lines on a map." To provide maximum flexibility to its private development partner, VDOT gained environmental clearance for the project with an EIS assessing the impact of a 250-foot wide "development corridor," located anywhere within a wider 500-foot "alignment corridor." The average cross section of U.S. Route 460 is 131 feet wide. Although this unusual approach would seem to have overstated certain impacts, it affords the developer the flexibility to locate the project anywhere within the 500-foot alignment corridor. VDOT assumed that the benefits of this flexibility outweigh the cost associated with additional mitigation measures emanating from the review of the wider build section.

The U.S. 460 project achieved a ROD in September 2008, and VDOT initiated procurement for the project through its PPTA program in 2009. That initial procurement was canceled and the commonwealth issued a new PPTA procurement in mid-2010. It is anticipated that the $1.7 billion availability payment concession is set to reach financial close in 2012. The benefits of VDOT's innovative approach to clearing this project remain to be seen. The outcome of this project should be watched closely, as it may serve as a model for others to follow, if the flexibility afforded by this approach proves to have been helpful.

Officials at GDOT also believe that potential benefits may be derived from the use of this approach, noting that

> [t]here appears to be a difference in opinion as to what changes would trigger reevaluations in different FHWA Division Offices around the country. You need to be legally sufficient to comply with NEPA, but it is helpful if NEPA can be cleared in as general a way as possible so that there is flexibility for innovation down the road. It may be possible to clear a footprint without specifying other aspects of the design.

Determining the Appropriate Level of Design During NEPA

The level of design performed during NEPA is another factor to consider when agencies are contemplating procuring projects on a P3 basis. A balance must be struck between the need to reach a level of design that allows the project's impacts to be properly considered and mitigated in an FEIS and the desire to maximize the flexibility for a private partner to innovate during final design.

NEPA documentation is usually completed as part of a project's preliminary design. In fact, FHWA regulations provide that NEPA approval constitutes approval of "general project location and concepts" [23 C.F.R. § 771.113 3(b)]. Public owners can assume the risk of successfully completing this phase of work themselves, or as was discussed in Chapter 5, public owners can share this risk by entering into a predevelopment agreement P3 before NEPA completion. In most cases, the level of design required to complete the NEPA process represents approximately 30% of the total project design. Though such designs lack detail, their importance should not be underestimated, because the design will specify the location and general project concept, both of which are often critical to the ultimate financial success of a P3 project.

Even though a 30% design is usually sufficient for a public owner to obtain a NEPA approval, under certain circumstances (e.g., projects in environmentally sensitive areas) it may be necessary to design the project to a much higher level (e.g., 70% design) to address all potential impacts adequately. Where this is the case, federal participation is available for the increased design costs. However, design to this level of detail is typically the responsibility of the private P3 partner or the

design–build contractor. If the public owner delays P3 procurement until the NEPA evaluation is complete, the project design will be significantly advanced before the private entity starts its work, which reduces the potential benefits a public owner can obtain from a design–build/P3 project. Such a delay may not be necessary if the public owner is willing to enter into a predevelopment agreement P3. Under predevelopment agreements, the private entity assists the public owner in defining a feasible project, which may include work related to the NEPA evaluation process. These agreements are structured for the public owner to pay the private entity for some or all of its predevelopment work expenses. If the public owner ultimately selects a viable P3 alternative for the project, then the private entity has a right of first negotiation for the project's development phase agreement.

If the P3 procurement occurs after NEPA's completion, the sponsoring agency may wish to consider completing a less than 30% design to allow greater opportunity for the private sector to define the physical and operational characteristics of the project in a manner that capitalizes on its design expertise. According to officials at the Virginia OTP3, the EIS for the commonwealth's U.S. Route 460 project was completed based on a less than 30% design (sometimes referred to as a "10 percent design," although such a designation does not have a precise definition). As previously described, a planning corridor of 500 feet was studied, an area within which a road approximately 200 feet wide can ultimately be sited. The expectation is that the private partner will have significant flexibility in designating the road's alignment and interchange configurations. This approach, though, involves certain drawbacks. OTP3 officials remarked that the lesser location specificity within the larger-width analysis corridor made it more difficult to estimate costs. This scenario, in turn, caused greater uncertainty in pinpointing right-of-way impacts (which was more of a political challenge rather than a costing challenge when attempting to satisfy property owners' inquiries) and did not allow for a thorough understanding of the project's termini with respect to operational (e.g., system-to-system interchange configurations) and constructability issues.

Awarding Early Construction Contracts in Strategic Instances

In certain cases, some DOTs have used the award of nontraditional procurements to accelerate project delivery. Although state law makes it difficult, if not impossible, for WSDOT to enter into P3 arrangements with private financing, the department has accelerated the implementation of needed projects by entering into early design–build contracts before the completion of NEPA for two major projects. One is the SR 520 Bridge Replacement and HOV Program. SR 520 is a 13-mile east-west highway extending from SR 202 in Redmond west to I-5 in Seattle. A critical component of the route is the existing four-lane, 1.44-mile Evergreen Point Floating Bridge across Lake Washington. This is a high-priority project because the existing bridge is nearing the end of its useful life and is at risk of failure in the event of an extreme weather or seismic event.

To expedite the completion of the project, WSDOT split the project into three components, each of which had independent utility and was cleared with separate environmental documents. One of these components is the construction of the pontoons on which the new bridge will rest. To expedite completion of this portion of the project, WSDOT awarded a design–build contract for the fabrication of the pontoons 1 year before gaining a ROD for the bridge replacement in mid-2011. Among reasons for taking this approach was the ability to shorten the time required for an emergency bridge replacement, if needed, from 5 years to 1.5 years by using the 33 preconstructed (and stored) pontoons. In addition, the pontoons will be available for use in the construction of the permanent replacement of the bridge. WSDOT awarded a design–build contract for the replacement of the bridge in 2011 to the same firm that fabricated the pontoons.

WSDOT took a similar early contract approach for the replacement of the Alaskan Way Viaduct in downtown Seattle. The aging elevated structure, which separates much of downtown Seattle from the waterfront, will be replaced with a 54-foot diameter, bilevel vehicular tunnel. The 2-mile tunnel is expected to cost $2.0 billion. WSDOT awarded a design–build contract for the project in December 2010, with the ROD gained in August 2011. This approach enabled early procurement of the tunnel-boring machine, which significantly reduced the long lead time for obtaining such equipment. This approach was made possible because it was determined that the early award of the design–build contract would not result in any significant changes to the outcome of the NEPA review.

These experiences demonstrate that under the right circumstances, it is possible to expedite the implementation of projects by breaking them into component parts that can be separately cleared, and, in some cases, can help to facilitate the start of construction before the completion of NEPA. This approach may be used with P3 projects and non-P3 projects alike.

Maintaining the Independence of NEPA with Early Private-Sector Involvement

One common concern with early private involvement in the definition of projects is the perception that the private partner's participation will unduly influence the outcome of NEPA assessments. Private involvement can occur in two distinct

ways. In some cases, such as the I-95 HOT Lanes in Virginia or the I-35W component of the North Tarrant Express Phase II in Fort Worth, the private-sector partner may become involved in a project before the start of NEPA analyses. In this case, the private partner plays a planning role in developing projects at a conceptual level that will then be the subject of a NEPA analysis. With the I-95 HOT Lanes, private involvement was initiated through an unsolicited P3 offer, whereas with the I-35W, it was initiated as an adjunct to the solicited P3 procurement for the North Tarrant Express Phase I. With pre-NEPA private-sector proposals, the project sponsor has the ultimate responsibility for determining the merit of the offer and deciding whether to initiate a formal NEPA review.

In cases where a NEPA review does ensue, the preparation of all NEPA documents is led by the public-sector project sponsor, not the private partner. The project sponsor may use input from the private partner in the analysis, but any options supported by the private sector would be weighed against other options and vetted in front of the public. Private involvement may also arise during NEPA if an unsolicited P3 offer is received or the project sponsor initiates a P3 procurement. In this case, any concepts developed by private developers would be vetted independently by the project sponsor under the lead federal agency's review. This was the case, for example, with the Capital Beltway HOT Lanes, following VDOT's receipt of an unsolicited private development offer 3 days after the close of the public comment period and after the release of the DEIS in March 2002. The private offer was then considered together with the comments received on the DEIS. However, it was not until January 2005 that the Commonwealth Transportation Board selected the private partner's HOT widening concept as its locally preferred alternative.

As OTP3 officials explain, ultimately the locally preferred alternative for the Capital Beltway was an amalgam of public and private inputs:

> VDOT's environmental process was kept separate from the PPTA process. However, VDOT's FEIS alternative evolved Fluor's conceptual proposal. Fluor changed VDOT's slip ramps between the [General Purpose] and HOT lanes to direct access and also changed entrance and interchange locations. In the end, Fluor took the design concept even further after the ROD. In retrospect, VDOT and FHWA were able to incorporate Fluor's design refinements post-ROD.

As senior planning staff from NCTCOG observe, early private-sector involvement in the definition of projects during NEPA has led to mixed results:

> There have been good and bad experiences with bringing a P3 developer onboard early in the project definition process. This happened with the Trans Texas Corridors. This was the idea of Governor Perry and was a top-down project that people were generally opposed to. The Governor's idea was to develop large highways bypassing urban areas and when TxDOT retained a private development partner early in the process to define the project the public reacted negatively because it appeared that the outcome of the process was predetermined.

OTP3 officials note that ultimately any input received from private partners during NEPA must be treated like suggestions offered by any other type of stakeholder. Yet, there remains a certain level of discomfort among some in considering suggestions from a private developer with a vested interest in the outcome of a NEPA action:

> A good idea is a good idea no matter where it comes from. It needs to be vetted just like any other concept. Regulatory agencies often treat private ideas with a certain level of skepticism, but when you compare the ability of private alternatives to meet the purpose and need established for the project to that of earlier alternatives you can see the value they add. You can also get good ideas from stakeholders at public meetings. Somehow using good ideas that originate from private partners is not viewed as being as robust or defendable.

As demonstrated by the experience with the Capital Beltway HOT Lanes EIS, it is entirely possible to use NEPA as a platform to assess private-sector concepts and to incorporate them into preferred alternatives that are viewed positively and are more likely to have successful outcomes as P3 concessions. However, as described in Chapter 5, there is general movement away from early private involvement during NEPA by public project sponsors and private development partners alike. An optimal outcome may be to use the NEPA process to consider the possible private development of transportation projects and inform the ultimate decision whether to proceed with a project on a P3 basis.

Other Strategies to Afford Flexibility After NEPA

After the completion of NEPA, if the decision is made to proceed with the procurement of a project on a P3 basis, there are numerous strategies to be considered to allow flexibility to accommodate private innovation.

Using Alternative Technical Concepts

Successful consideration and application of a P3 can benefit from a sound approach by allowing P3 proposers to incorporate alternative technical concepts (ATCs) into their proposals. The section on procuring the P3 following NEPA in Chapter 5 introduced the advantages of a prescribed ATC process during the selection of a preferred P3 bidder. An

effective ATC process can allow design innovations from the private sector—a primary reason for involving them on a P3 basis—to improve on the base project design requirements set forth in an RFP, from either a technical or development cost standpoint. Proposers are motivated to provide ATCs to gain technical advantage over the competition (Papernik and Farkas 2009).

By permitting ATCs during bidder solicitation, public sponsors must recognize that their acceptance can result in changes to the RFP requirements that are exclusive to the suggesting proposer; by establishing standards that the ATC must be "equal to or better than" the RFP's original requirements, the ability to make fair cost comparisons among proposers can be retained because the ATC cannot result in cost savings by merely reducing quantities. In addition, FHWA design–build regulations permit ATC proposals, but not as a substitute for a base proposal that responds to the RFP's original requirements (23 C.F.R. § 636.209). Many FHWA division offices, however, have permitted incorporation of preapproved ATCs without including the base option, effectively waiving this requirement, but it is also possible to formalize this approach through a SEP-14 waiver (Papernik and Farkas 2009).

A decision must also be made on whether the public sponsor or private entity will be responsible for additional environmental evaluation if the proposed ATC deviates sufficiently from the design concept as cleared in the applicable NEPA document. Private entities are likely more willing to introduce ATCs if the public sponsor bears this risk, but in a competitive environment, a private entity may be more willing to assume the risk if it knows its ATC will significantly differentiate it from any competition. In such a case, assuming the cost of a reevaluation (as well as waiting for its completion, regardless of who pays for it) may be worth the trade-off to surpass the quality of competing proposals or to improve the bottom line.

A private developer reports that in both Texas and Georgia opportunities for private partners to identify issues suitable for value engineering during the bidding process have emerged. However, when value engineering opportunities arise, the norm is for sponsors to become interested, but then transfer the risk associated with the changes to the private partner. The same developer has come across this type of situation four times within a few months but also has seen that changes can be put through if they are identified early enough in the process.

Although the project was canceled at the time of this writing, the Northwest Corridor P3 in Atlanta offers an excellent example of the evolution of a public project sponsor's approach to ATCs. As a GDOT official close to the Northwest procurement explained,

> One key element in being able to deliver value through P3 procurements is the ability to consider alternative technical solutions proposed by private partners. For instance, if your scope calls for a system-to-system interchange, which is designed with a certain number of bridges, the private partner may come up with a different approach that involves a smaller number of bridges or different specifications and can be built at a lower cost.

GDOT believes that a fair ATC process can enhance procurements. With the Northwest Corridor, initially GDOT was not prepared to assume the risk for any changes arising through the ATC process that would have required a reevaluation. However, in the end, GDOT agreed to complete any reevaluation within a given time frame that might be required as a result of the ATC. The GDOT official explains the rationale behind the department's change of approach:

> With P3s you need to adopt a NEPA strategy to provide for as many potential unknowns as possible. This type of approach gives private partners the flexibility they need to address unforeseen issues and to innovate. It is counterproductive if an innovative idea is subjected to a veto.

A Vision for Enhancing the Decision Guide Process to Consider the Potential for P3 Development

The initial intent of this study was to identify where in the Decision Guide processes the decision to procure projects on a partnership basis is made and to study the implications of that timing on the planning and NEPA processes. Although there is merit in engaging potential private partners early on in the definition of projects, the research reveals there is movement away from doing so. Private developers prefer to avoid the risks associated with gaining environmental clearance, whereas public sponsors want to maximize competition and avoid the appearance that private involvement may influence the outcome of NEPA reviews.

These findings suggest that most P3 procurements move forward after project sponsors have gained environmental clearance for projects and after the Decision Guide processes are complete. However, the research also revealed that several states and regions are considering the possible use of tolling and P3s early on in the Decision Guide and then using the planning and NEPA processes as a platform to vet these possibilities. In some cases, regions and states conduct their own feasibility assessments of projects in the early stages of conceptual development to identify viable candidates for P3 development and then adapt NEPA reviews to assess tolled alternatives.

The research also revealed that state and regional policies are especially effective in encouraging or even requiring the consideration of tolling and P3 development. When regions have well-defined policies, such as the need to sustain a regional

roadway system, it is possible to weave tolling and P3s into a regional vision. As a member of the planning team at NCTCOG was quick to point out, this is a relatively recent development:

> When NEPA and the MPO processes were first developed, financing was not incorporated into the process. The rules were developed first, but now financing and funding are pivotal to the project development process. Today major projects are required to have financial plans prior to the release of federal funding and states, including Texas, have policies that direct that projects adding new capacity will be tolled.

Regional policies and dialogue are perhaps the most effective tools to facilitate the consideration of P3s. This has led NCTCOG to identify $6 billion worth of priced projects in the 2035 MTP for the Dallas–Fort Worth Metroplex. As NCTCOG officials note, "If these roads are not tolled, they will not be built . . . it is hard for NCTCOG to think differently."

Although there is not one single way to develop the decision-making process, the way used needs to be flexible. One of the most important points is developing an understanding of which projects may be feasible for P3 development. As many interviewees observed, it is better to consider the possibility of P3 development during the Decision Guide processes and to decide not to go down that path than to defer the decision to the end of the process and then have to go back to the beginning of the planning development. To identify which projects are suitable for tolling and P3 development, project sponsors need to conduct analyses separate from the planning and NEPA processes. These include forecasts to ascertain the revenue generation potential of projects if they are tolled, as well as VfM assessments that include the calculation of life-cycle costs and a public-sector comparator analysis to identify the cost of implementing and maintaining the project on a public basis. These analyses should be prepared concurrently with the Decision Guide and be used to inform key decisions including whether projects will be tolled, if they will be implemented on a P3 basis, the type of concession to be used, the term of the concession, and the amount of any public subsidy that may be needed.

Both the planning and NEPA processes should be used to gauge the viability of tolling and P3 development. The planning process should explore the possible use of tolling and P3 procurements from a regional policy perspective and should engage stakeholders to determine the level of support for these options. Once candidate projects have been identified through the analyses described, the environmental process should compare the possible use of tolling and P3 delivery to traditional public procurement. This analysis should provide clear information on the implementation time frames that would result from using the different procurement and revenue options and should assess the implications of those different time frames as part of the analyses. If these different possibilities are debated and assessed in MPO and NEPA analyses, decision makers and their stakeholders will be better able to understand what is feasible and then use the Decision Guide as a platform to decide whether tolling and P3 development are appropriate for the local region.

As a former high-ranking U.S. DOT official and legal advisor states,

> We have approached the issue of P3s sideways in the United States, focusing on them using a project-by-projects basis rather than taking a programmatic approach. We have developed a culture in the United States that P3s are a "tool in the toolbox," but only one that is used infrequently, on a restricted basis and with skepticism.

Some states and territories, including Virginia, Texas, and Puerto Rico, are beginning to adopt a programmatic approach to P3 development for highway improvements—and even other modes of transportation. To be successful, forward-thinking public administrations would have to champion the use of tolling and P3 development. P3s also need to be integrated into the Decision Guide and into the different functions served by MPOs and DOTs involved in the project development process. P3 projects may still be implemented without using this philosophy, but its use will be more episodic rather than programmatic.

CHAPTER 7

Integrating P3s into the Decision Guide

This final chapter discusses how the findings and implications of the research can be incorporated into the Decision Guide. Together, the four phases in the Decision Guide comprise the state and metropolitan planning and environmental approval processes as mandated by current federal and state law. Broadly speaking, the long-range transportation planning and programming phases of the Decision Guide align with those of the state and metropolitan planning organization process; the corridor planning phase involves early, project-specific planning and early project study activities; and the environmental review/NEPA merged with permitting phase involves the NEPA and other environmental law processes that are typically addressed concurrently, at least to some extent, with the NEPA process.

The Decision Guide breaks these four phases into a series of 44 steps involving discrete decision points. An illustration of the Decision Guide's four phases and 44 decision points is shown in Figure 7.1, which is also provided on the TCAPP, now known as PlanWorks, website. It should be noted that although the Decision Guide establishes this structure, not all the steps in the process are followed or are applicable for every project. In addition, sometimes the steps that are followed do not necessarily occur sequentially but may occur concurrently, iteratively or in some cases, in a different order. Although the decisions that must be made to implement transportation improvements are predictable, there is a great deal of flexibility involved, because the timing and interaction between these steps are influenced by local conditions, institutional relationships, and happenstance. This is true with the planning and environmental processes, particularly with the consideration or implementation of P3 procurements.

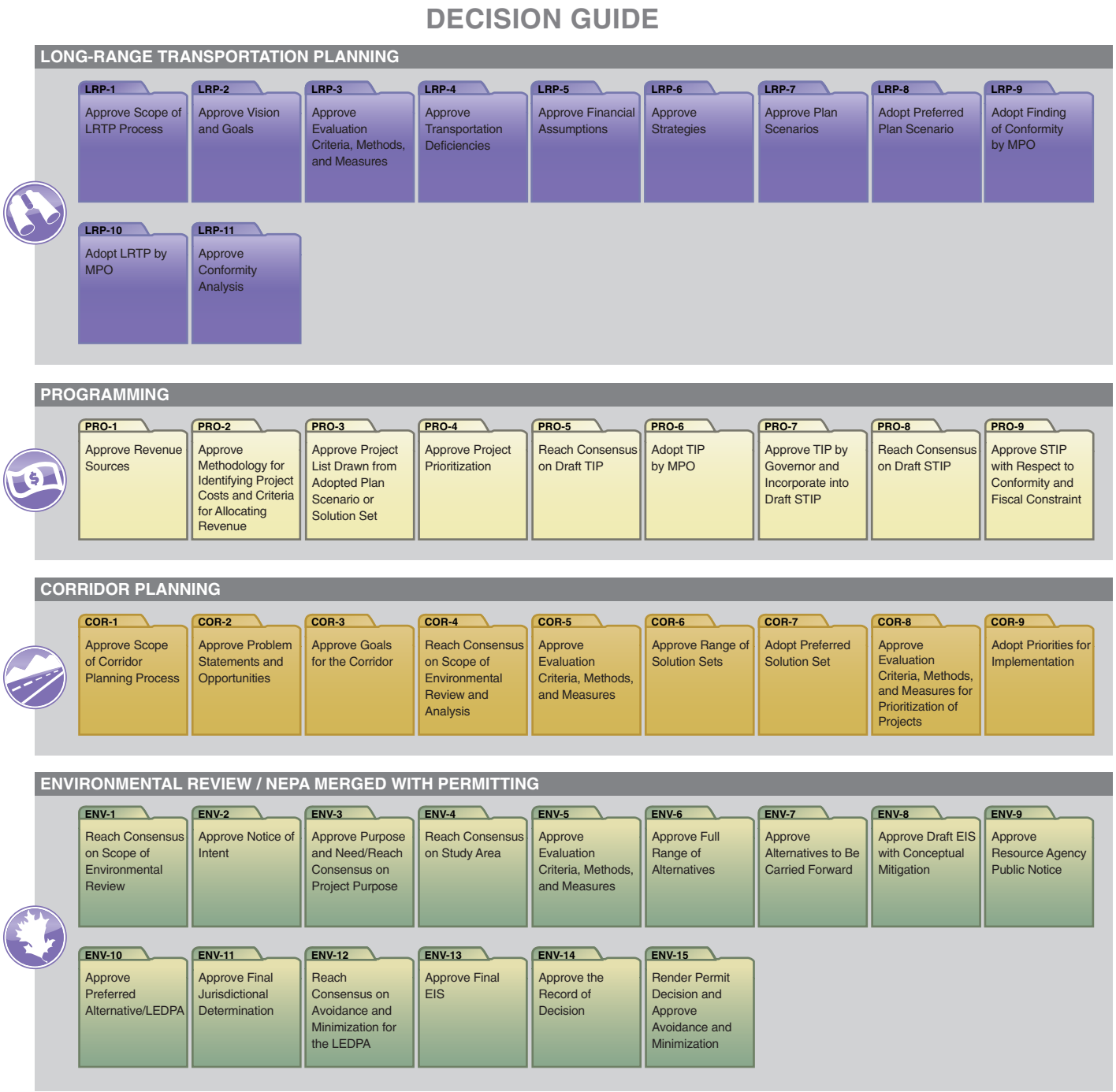
In discussing the Decision Guide, it should be recognized that many states—if they consider the use of P3s at all—first seek to procure P3 projects only after the completion of the NEPA process (see Chapter 5). The risk of administrative and litigation delays and changes to the project that can occur before completion of NEPA discourage private investors and make it difficult to obtain the financing that is always a part of transportation P3s. Nevertheless, the possibility of a P3 is often under consideration by the state or local transportation agency long before the P3 is actually formed (see Chapter 5). This possibility can have a significant impact on how the project is developed. In addition, involving the appropriate experts and the potential private partner can result in a project that is more easily and more profitably developed as a P3, resulting in greater benefits to the procuring agency and to users of the new project.

The rest of this chapter reviews each of the 44 decision points within the Decision Guide and their relationship to P3 consideration, drawing from the detailed research findings as presented in earlier chapters.

P3s and Long-Range Transportation Planning

The Decision Guide's first phase focuses on the long-range transportation process and the development of a long-range transportation plan (LRTP), equivalent to the MTP referred to throughout the report, under current federal guidance. As the TCAPP website states: "Long-range planning provides the foundation for all other aspects of transportation decision making by establishing the vision and goals for transportation within a region and identifying strategies and project concepts for implementation" (ICF International 2012a).

As highlighted throughout the following 11 steps, this phase in the Decision Guide offers the opportunity to begin consideration of alternative revenue sources for transportation improvements and those associated with P3 procurements (especially tolling) as part of a region's transportation vision and goals, fiscal constraint process, and preferred scenario of development. These outcomes can then be carried forward into later phases of the Decision Guide, especially into the NEPA process where specific projects are evaluated for implementation. Examining and setting goals, policies,



Source: ICF International and URS Corporation 2014.

Figure 7.1. The PlanWorks, formerly known as TCAPP, Decision Guide.

and identifying alternative funding sources during this phase will have a significant impact on the ability to consider and to ultimately decide on P3 procurements later in the Decision Guide process.

LRP-1—Approve Scope of Long-Range Transportation Plan Process

This first step in the long-range planning process is a scoping exercise, whereby local agencies and stakeholders involved in the development of the plan agree on the issues the plan will address and the information to be gathered and reviewed during the process. This is a strategic point in the long-range planning process to identify new processes and issues that should be considered in the process, such as the use of innovative revenue sources and procurement models.

LRP-2—Approve Vision and Goals

In this step of the long-range planning process, the local region establishes the vision and goals for the transportation plan. This process involves input from multiple stakeholders and should reflect larger regional goals and values. Although many stakeholders would not necessarily associate transportation goals with revenue generation, there are strong connections between the two, and if a region is facing funding shortages, the goals of generating new sources of revenue or being able to tap into new sources of equity and financing should be considered and included. An important source of revenue is the use of tolling, and its regional feasibility and public acceptability must also be considered. A goal of developing a regional network of tolled or priced managed lanes could be a major focus of a long-range plan that may form the basis for specific project identification and later evaluation. Or, if the goal is developed as a separate plan or study, it could be incorporated directly or be a reference.

This decision point is arguably the most important point in the long-range planning process in which to consider the use of P3 procurements and innovative revenue sources. If these are recognized goals, then through subsequent planning steps, an agency can develop appropriate criteria to assess the extent to which different projects and alternative plans achieve these important goals. If revenue generation and innovative procurement strategies are not included in the goals formulation stage, they are not likely to factor into the next steps in the long-range planning process.

LRP-3—Approve Evaluation Criteria, Methods, and Performance Measures

In this step, evaluation criteria and performance measures are identified to enable decision makers to compare different projects and scenarios and their ability to meet the goals and visions established for the long-range plan. If those goals include generating new revenue sources or gaining access to previously unavailable sources of equity and finance, then toll projects and P3 procurement strategies would score highly in this area and might therefore be more likely to be advanced.

LRP-4—Approve Transportation Deficiencies

Because this decision point is limited to identifying facilities and locations where deficiencies exist, this is not the appropriate juncture to consider opportunities for improvement-specific revenue or delivery strategies (e.g., tolling or P3s).

LRP-5—Approve Financial Assumptions

This step of the long-range planning process involves two important aspects. The first is to identify the revenue sources available to the region specifically to address transportation needs. The second is to establish a methodology to estimate the costs of individual projects and then to align the cost of the overall investment program with the resources available during the long-range planning period.

If the use of tolls and P3 procurements is on the table, then this step could involve an assessment of each project for the use of tolls or private financing. If tolling were found to be appropriate for given projects, the revenue sources could be expanded to account for this finding and the revenues generated through tolling could be introduced to the fiscal constraint analysis.

LRP-6—Approve Strategies

This decision point of the long-range planning process involves developing strategies to address the deficiencies identified in LRP-4. TCAPP defines strategies as specific tactics or policies employed or recommended by an organization and specifically points to land use as an example. Policies related to tolling, the use of other alternative revenue sources, and P3 consideration, in general, could also be considered at this decision point, as discussed in Chapter 6. Implementation of such policies, however, may be beyond the scope of the partners who typically participate in this decision point and may require the involvement of a higher-level decision-making body such as a state legislature.

LRP-7—Approve Plan Scenarios

This step involves developing scenarios—groups of projects and strategies—using the strategies emerging from LRP-6 and then testing and refining those strategies for their performance using the criteria established in LRP-3. Depending on

the goals and strategies adopted in earlier phases of the long-range planning process, the scenarios could involve the use of tolling and P3 procurements.

LRP-8—Adopt Preferred Plan Scenario

This step involves comparing the performance of the scenarios identified in LRP-7 for their ability to meet the vision and goals underpinning the long-range plan. This decision point culminates with the selection of a preferred plan scenario. Depending on the goals and strategies adopted in earlier phases of the long-range planning process, the compared scenarios and the preferred scenario could involve the use of tolling and P3 procurements. The preferred scenario could form the basis for a regional plan with a network of tolled or priced roadways, which could be carried forward into purpose and need statements and alternatives analysis for specific projects during the NEPA phase of the Decision Guide.

LRP-9—Adopt Finding of Conformity by MPO

In this step of the long-range planning process, the MPO conducts a regional air quality analysis to determine whether the adopted preferred plan scenario identified in LRP-8 meets current conformity requirements (see Chapter 3). The MPO Board must adopt a finding of conformity to meet federal requirements. If any components of the preferred plan scenario involve tolling, the models used in the conformity analysis should assess the effects of road pricing on travel behavior in the region. It is likely that the use of tolls would have the potential to result in air quality benefits.

LRP-10—Adopt LRTP by MPO

This penultimate step of the long-range planning process combines the preferred plan scenario, fiscal constraint, and air quality conformity processes emerging from earlier steps in the planning process and modifies them to reflect comments received on the draft LRTP. Once this is confirmed, the LRTP is adopted.

This phase would not involve new consideration of tolling or P3 procurements. However, it is possible that it could involve minor adjustments to the use of tolls or P3 procurements based on comments that may have been received.

LRP-11—Approve Conformity Analysis

This decision point in the long-range planning process involves the legal requirement to obtain federal approval of the conformity of the LRTP. This may involve approval of the assumptions and modeling techniques used to assess the effects of tolling on travel behavior.

P3s and Programming

The programming phase of the Decision Guide is the process through which the TIP is developed and adopted. TIPs are developed by MPOs for urban areas and by state DOTs for rural areas. The STIP combines all TIPs into one document for each state. Both the TIP and the STIP must be financially constrained. This means that both must include a financial plan for implementing the projects on the TIP or STIP, identifying the public and private funding sources that can reasonably be available for the project and the strategies that will be used to obtain any additional funding that may be required. This does not, however, include projects listed only for informational purposes. Only the projects for which full funding can reasonably be anticipated during the time contemplated for completion may be included in a TIP or STIP. In nonattainment and maintenance areas, funding for projects on the first 2 years of the TIP (and as it is incorporated into the STIP) must be "available or committed." See the section on understanding funding availability and fiscal constraint with P3s in Chapter 3 for more discussion about this area, which is of particular concern for P3 projects because P3 funding is often not yet committed until project financial close.

Both TIPs and STIPs must also demonstrate transportation conformity. The bulk of this work is done by MPOs, because the nonattainment and maintenance areas are typically within MPO boundaries.

PRO-1—Approve Revenue Sources

Using the same revenue projections as the long-range plan, this initial step in programming confirms the funding sources available for the TIP and STIP, thereby achieving a relative level of consistency between the long-range plan and these short-range planning documents. This decision point also identifies where any funding restrictions or requirements may exist, such as the need for authorizing or enabling legislation, and establishes agreements between funding partners, as needed.

Because the TIP and STIP processes must be renewed at least every 4 years and can also be revised as often as necessary, new financial developments and funding sources should be captured at this stage of the programming process, including the use of tolling or P3 procurements, which may require legislative approvals.

PRO-2—Approve Methodology for Identifying Project Costs and Criteria for Allocating Revenue

This step encompasses multiple aspects. The first aspect is to establish an approach for estimating the project costs to be included in the TIP and STIP. This aspect is not directly

relevant to the consideration of P3 procurement, although it should be noted that under the right circumstances, the use of P3s can reduce project development costs.

The second aspect involves establishing criteria for allocating regional revenue among projects in the TIP or STIP. This aspect involves allocating funding based on project type, location, status of planning, engineering and environmental studies, and indication of the severity of project need. If expanding state and local revenues and engaging the private sector in the development of transportation infrastructure are goals established during long-range planning, then it could be expected that specific selection criteria could be developed to compare the feasibility of introducing tolling or P3 procurements for projects to be considered for TIP or STIP advancement. This activity also includes identifying any restrictions or requirements that may apply to specific funding sources occurring before the identification of transportation needs and solutions so that the criteria will not be targeted to support particular projects. If toll revenue is already a source of regional revenue, criteria for its distribution on a corridor-specific or regionwide basis is an important consideration to be formalized through policy.

One unique and powerful aspect of P3 procurement is leveraging effect. This is especially true with P3 projects that involve multiple sources of revenue and financing. This situation often occurs with projects that are not otherwise able to generate adequate revenue streams to pay for their entire implementation costs on a standalone basis with a limited-recourse financing. In such cases, projects may only be bankable and attractive to private-sector investors if they receive a subsidy in one form or another from the public sector. This situation is advantageous to public-sector sponsors because they are able to implement the project without having to pay the entire capital cost from public coffers, thereby freeing the money they would have spent for other uses. In such cases, it may actually be advantageous for local decision makers to prioritize the allocation of money to P3 projects, as described, before allocating money to those projects being funded by traditional means, because by doing so they increase revenues available to support the TIP or STIP.

PRO-3—Approve Project List Drawn from Adopted Plan Scenario or Solution Set

This step of the programming process involves identifying projects from the long-range plan or corridor planning processes that will be considered for funding in the TIP or STIP by using the methodology developed in PRO-2. To the extent that the methodology includes metrics to evaluate and/or consider the use of tolling or P3s for projects under review, projects that lend themselves to these options would have more likelihood of being advanced. If not, there is no P3 consideration at this step beyond those P3 considerations that are already designated within the long-range planning and corridor planning processes back to which this step refers.

PRO-4—Approve Project Prioritization

This decision point assesses candidate projects and then prioritizes them based on an assessment of their ability to meet the criteria as established in PRO-2. The prioritized list also includes information on project costs, implementation schedules, and any applicable revenue considerations. It is assumed that the review of applicable revenue considerations may result in potential tolling projects being advanced before other nontoll projects because they provide their own revenue sources. To the extent tolling and P3s have been considered in previous steps, the prioritization of projects using these tools would be considered in this step.

PRO-5—Reach Consensus on Draft TIP

In this step of the programming process, the projects to be included in the draft TIP are selected by using information from LRP-5 regarding funding restrictions and/or agreements. Depending on the groundwork laid through previous steps, consensus among decision makers at this point may favor prioritized projects with support from tolls or other alternate revenue sources, which may be most attractive to P3 implementation.

PRO-6—Adopt TIP by MPO

In this step, the draft TIP is reviewed by partner agencies and the public, with MPO determination if any comments require actions or modifications to the TIP. The different agencies involved also confirm that the conformity and fiscal constraint processes have been correctly conducted. Unless an issue is raised that may impact the inclusion of tolled or alternatively funded projects, no additional P3 consideration occurs at this step. Once this process has been completed, the TIP is approved by the MPO.

On occasion, the use of P3s can affect the conformity analysis, especially if tolls are involved and the traffic model shows a significant change in motorist behavior over a free facility. It is also possible that a project once prioritized in the TIP or STIP as a nontolled project could later be implemented as a toll project requiring an amendment to the TIP or STIP.

PRO-7—Approve TIP by Governor and Incorporate into Draft STIP

In this step, the governor or designee reviews and approves the TIP. The TIP must be updated at least every 4 years, but also

may be, and commonly is, updated more frequently. If the TIP includes projects scheduled for implementation beyond the 4-year horizon of the TIP, FHWA regards these elements as informational. In addition, in air quality nonattainment and maintenance areas, a conformity determination of the TIP and any update of the TIP must be made by the MPO, FHWA, and by the Federal Transit Administration (FTA). Once the conformity determination is made and the TIP is approved by the governor or designee, the approved TIP (or updated TIP) is then incorporated into the STIP without change. No new consideration of P3s takes place at this step.

PRO-8—Reach Consensus on Draft STIP

The STIP and TIP processes, although arising from separate legal requirements, are implemented in a coordinated and interactive way. The timing of the two processes must be compatible. The MPO must consider the STIP in developing the TIP, and the state DOT must develop portions of the STIP in urban population areas over 50,000 and in cooperation with MPOs. Thus, the process is interactive and concurrent. That is one reason why state DOTs sit on all MPO boards ex officio. The federal regulations applicable to STIPs and TIPs set forth this cooperative process in considerable detail. No new consideration of P3s takes place at this step.

PRO-9—Approve TIP and STIP with Respect to Conformity and Fiscal Constraint

Unlike TIPs, which are only subject to approval of the MPO and the governor or designee, STIPs are subject to approval by FHWA and FTA. No new consideration of P3s takes place at this step.

P3s and Corridor Planning

Corridor planning is not a step that is undertaken for all projects and is not technically a formal part of the project development process. Rather, it is the transition from long-range transportation planning to the formal beginning of the NEPA process. The TCAPP website indicates that corridor planning is presumed to precede the programming phase. Thus, environmental studies, preliminary engineering, initial right-of-way assessments, and other initiatives to better define the general location and scope of the proposed project are conducted in this phase of the process.

The utility of addressing the potential for P3s in the long-range plan and transportation improvement program was previously discussed. As the planning process hones in on specific aspects of individual projects, the benefits of involving potential P3 developers become more apparent. Private-sector developers can aid government transportation agencies in identifying general locations and project concepts that make the project a more attractive candidate for private investors. Although these factors should not be the sole determinants in the process, they should not be ignored, especially if project implementation is projected to require private equity investments.

Unfortunately, from the private investor's perspective, this is still a high-risk phase of the process. General locations, project scope, and a range of design concepts are still under active consideration. There is no guarantee that an investor-friendly project will come out of this process. Indeed, some projects never progress beyond this stage to final implementation. Thus, it is typically too early in the project development process to include private investors. Furthermore, a transportation agency may be concerned about involving a private investor with a strong stake in a particular outcome. The public could well raise objections about the possibility that a private investor might seek to skew the decision-making process in favor of its preferred alternative—although it should be noted that such concerns should be ameliorated by safeguards built into the process ensuring that the private investor merely provides input to the public agency decision makers. (See Chapter 5 for a complete discussion about these disadvantages.)

Several options are available to transportation agencies that would like to gain insight into issues relevant to a P3 development model. First, the agency can retain financial advisors, project development specialists, and other experts during the planning phase to advise the agency on the revenue and investment implications of various project alternatives. This process could include outreach efforts to potential P3 developers for their input regarding environmental risks and other factors that may impact project implementation.

Second, another option (which is not really an alternative, but possibly an additional option) is for the agency to solicit proposals from potential developers and enter into a predevelopment agreement with the selected entity. As was discussed in Chapter 5 under a PDA the transportation agency would typically pay a fee to the potential developer in return for provision of services, such as performing studies, providing information related to the project, and other similar commitments. For most projects, the fee covers only a portion of the cost borne by the developer. In these cases, the developer is willing to enter into this type of arrangement in exchange for the right of first negotiation if the project proceeds as a P3. PDA procurements are primarily qualifications-based, although the price for the initial services may also carry some weight during the selection process.

COR-1—Approve Scope of Corridor Planning Process

This step envisions the formation of the relationships in the corridor planning process. These relationships may well

endure through the end of the environmental process and may even extend to monitoring construction. Thus, it would be appropriate to indicate, even at this stage, that a potential project may be a candidate for development through a P3, if the transportation agency itself is considering using a P3 approach. Not only will this enhance public trust when the P3 is pursued at later stages but this could also provide early notice of potential issues that the agency may face while in pursuit of a P3. The transportation agency should ensure that it can adequately address any questions that arise at this stage through its own staff or through outside consultants.

COR-2—Approve Problem Statements and Opportunities and COR-3—Approve Goals for the Corridor

After having defined a process for corridor planning, the transportation agency begins to focus on the specific transportation, location, community, and environmental issues that must be addressed. COR-2 identifies the range of deficiencies and opportunities within the corridor, including those that extend beyond transportation. The problem statements and opportunities resulting from this step are informed by the transportation deficiencies as identified within long-range planning and, in turn, inform the purpose and need during NEPA. (See Appendix A for TCAPP definitions of problem statement and objective opportunity.)

In COR-3, the agency and other participants focus on the goals to be achieved during the implementation of the transportation project and on the factors that drive the decision-making process. As with COR-2, goals from long-range planning inform this process, which in turn informs purpose and need statements. As was discussed in Chapter 6, purpose and need statements allow for the incorporation of tolling and other alternative forms of funding, if identified in the financial plan of an LRTP, and opportunities that capitalize on these tools should be considered in this step.

If the transportation agency is not already contemplating the use of a P3, it is beneficial to include the possibility as it approves goals for the project, because P3 procurement could affect the scope and location of the project. Available funding sources for the project, if they include possible private investment, tolls, and leveraged financing, could also be a significant factor in how the project is located and designed.

COR-4—Reach Consensus on Scope of Environmental Review and Analysis and COR-5—Approve Evaluation Criteria, Methods and Measures

Although the Decision Guide lists COR-4 and COR-5 as distinct steps of the corridor planning process, they are not truly independent sets of events. The scope of the environmental review and analysis are necessarily driven by the proposed scope of the activities under consideration. The same can be said for evaluation criteria and performance measures. Thus, it is assumed that these steps are separately expressed because they are critical parts of project development, and not because they clearly arise at this point in the process. Both FHWA and the Council on Environmental Quality regulations require the early consideration of environmental impacts, and environmental studies are an important element of deciding what the scope of that impacts analysis should be. Those studies should first occur during the corridor planning phase. Substantial benefits to the development of a P3 project can be gained in COR-4, especially because this key decision is so closely connected to ENV-1 (see on page 69, ENV-1—Reach Consensus on Scope of Environmental Review). For example, the results of environmental review and analysis at this point can provide a P3 with risk analysis information (see Chapter 4, page 30, P3s Require Technical Analyses Independent of NEPA and the Planning Process). In addition, environmental studies undertaken as part of transportation planning may also be used to further this work during a NEPA evaluation. Moreover, the development of evaluation criteria and performance measures will link general concepts to specific proposed solutions.

P3s may play only a tangential role in these steps, except where an examination of the corridor characteristics discloses benefits from use of a P3 approach. Probably the most significant benefit is associated with financial feasibility of the projects under consideration by the agency. In this regard, P3s are not simply a source for funding particular projects, but are planning mechanisms that free up resources that agencies can then allocate to other projects (perhaps in other corridors), making those other projects possible. Consequently, whenever a corridor includes a project that has the potential to pay for itself, in whole or in part, through revenue generated by the project, such as tolls, it is appropriate for the agency to consider whether a P3 approach is in the public interest. Thus, for example, a sound corridor planning process should include consideration of P3s early on to ascertain whether any projects within the corridor might have potential to generate revenues.

COR-6—Approve Range of Solution Sets and COR-7—Adopt Preferred Solution Set

These steps in the corridor planning phase analyze a range of approved solution sets and prepare selection of a preferred set. The set is influenced by the preferred scenario in the LRTP and can inform the environmental review process. Cost estimates of proposed solution sets are prepared to eliminate those that are unrealistic given funding options. P3 options to

deliver one or more facilities within the corridor should be considered at this point to accurately estimate the solution sets' costs. In addition, the use of P3s can potentially influence both the number of facilities that can be built in a corridor and the timing of the delivery of those facilities. P3 involvement can play an indirect role in shaping potential solution sets.

A preferred solution set is adopted for inclusion in the corridor plan based on an evaluation using the approved criteria, methods, and measures. This evaluation process may indicate that a solution set involving a P3 is preferred.

At some point in the corridor planning phase beginning with COR-6, a transportation agency contemplating the use of P3s may wish to involve its experts or consultants (and/or potential P3 developers) to identify specific solutions that best suit P3 development and to determine the priorities for implementation. An agency may even wish to consider the possibility of a PDA as part of the process to identify the preferred solution set or the priorities for implementation, particularly where the transportation agency contemplates developing portions of a corridor with P3s.

COR-8—Approve Evaluation Criteria, Methods and Measures for Prioritization of Projects and COR-9—Adopt Priorities for Implementation

These decision points involve the prioritization of individual solution sets using approved evaluation criteria, methods, and measures that result in ranked individual projects, sequenced for implementation. Prioritization aligns projects with available funding and allows other actions to take place that support implementation, such as P3 or tolling approvals. Further financial analysis can reveal a P3 project or one with alternative funding support to rank highly. In fact, available funding should consider a potential contribution of private equity or P3 financing. The Decision Guide suggests financial planning tools employed during COR-8 and COR-9 may include value engineering, an exercise a P3 partner or consultant may perform.

P3s and Environmental Review/NEPA Merged with Permitting

The last phase of the Decision Guide is environmental review/NEPA combined with permitting activities. The TCAPP website states (ICF International 2012b),

> Environmental review merged with Permitting represents the regulatory process that encompasses the actions required under the National Environmental Policy Act (NEPA), the Clean Water Act, the Endangered Species Act, and various other state federal regulations. Environmental review is generally the last step in the planning process for a transportation improvement, and is followed by final design and construction. When preliminary design is included in the environmental review process, it is often referred to as project development.

A primary finding of this research is that there are clear advantages in the consideration of and commitment to P3 procurement to deliver a transportation project. Consideration during the NEPA process can play an important role in helping to advance a successful P3 because this phase of the Decision Guide defines a preferred alternative and assesses and addresses a project's environmental and social impacts. The process identifies opportunities for serious public review, input, and buy-in, not only to the project but also potentially to its preliminary plan of finance and delivery. These considerations are discussed extensively throughout the report, notably in Chapter 6 in the section on incorporating tolling and other alternative funding in NEPA, which discusses incorporating tolling and P3 financing into purpose and need statements and NEPA alternatives analysis. In addition, Chapter 6 outlined several means of managing the NEPA process to facilitate the flexibility for P3 implementation after an environmental decision has been reached.

ENV-1—Reach Consensus on Scope of Environmental Review

Scoping and early coordination is the normal start of the NEPA process. Consensus is reached on the data, decisions, and relationships that evolved throughout the environmental review. If the transportation agency has determined that a P3 is a viable option for proceeding with the project, it may wish to disclose this to the participants, although many of the issues raised at this step are probably unrelated to the decision regarding whether to implement the project as a P3. However, in some circumstances, a project would only be able to proceed as a P3 because of funding constraints, and therefore might be relevant to feasibility and alternatives evaluation. If a PDA already exists, the potential P3 developer will be in a position to provide information and analysis in support of the scoping process.

ENV-2—Approve Notice of Intent

The notice of intent is a relatively formal step in the process when an EIS is required to inform partners and the public of the commencement of the environmental review phase. Although potential private partners do not have an active role in this process, the transportation agency and FHWA must take care that the notice of intent is broad enough to accommodate use of a P3 later in the process.

ENV-3—Approve Purpose and Need/Reach Consensus on Project Purpose

The project purpose and need is a critical part of the NEPA process. Although in most cases the purpose and need process is independent of the decision to build the project using P3s, this is not true in every case. Some projects are designed to work as a P3 from the outset and would not otherwise be implemented. If the use of a P3 is not under consideration or only represents one of many potential models for delivery, then the discussion of a P3 may be less critical or premature.

Financial feasibility is a legitimate consideration in development of the project purpose and need, which may also relate to the project being developed through a P3. The reasons for this result should be part of the discussion of purpose and need, as well as the range of alternatives under consideration. FHWA recognizes that tolls or other "nontraditional" funding sources may have already been addressed in the transportation planning process and be carried forward to the purpose and need of the project, as well as to the analysis of alternatives. A complete discussion of purpose and need, as it relates to tolling and to P3s, can be found in Chapter 6.

ENV-4—Reach Consensus on Study Area and ENV-5—Approve Evaluation Criteria, Methods and Measures

Steps ENV-4 and ENV-5 define the scope of analysis for both alternatives and potential environmental and social impacts. Although these steps may not directly relate to the decision to use P3s or other alternative delivery strategies, they are of critical importance to a private developer involved in the project at this point. Even if there is no private partner involvement yet or the decision to implement the project as a P3 has not been made, consideration should be given to private partner involvement when defining the study area to facilitate flexibility in the subsequent design of the project, especially by a private partner post-NEPA, who would be engaged at that time.

If the study area is too broadly defined, or the evaluation criteria are too imprecise, environmental compliance becomes more difficult. In that event, a tiered or phased process may be further required to provide project-specific analysis. This can have real cost implications for the environmental review undertaken in subsequent steps of the NEPA process. Conversely, a broader study area may help to capture an area of potential impact if the design of the project changes based on a private partner's later input. This approach can help avoid the need for an environmental reevaluation or at least make a reevaluation process more predictable by capturing existing condition data up front.

In considering the evaluation criteria and measures, many factors that relate to possible P3 development may be implicated. For example, the use of toll roads may have operational implications and could change certain environmental impacts. Issues relating to accessibility of the facility could also arise. Environmental justice concerns are sometimes raised in connection with toll roads and may have to be assessed as both a potential impact and a benefit. In Chapter 6, the sections on identifying data needs up front and study areas in environmental documents discussed the importance of identifying and managing data needs as well as defining an appropriate study area for P3 consideration.

ENV-6—Approve Full Range of Alternatives and ENV-7—Approve Alternatives to Be Carried Forward

Steps ENV-6 and ENV-7 result in the development of the full range of alternatives that meet the project's purpose and that will be analyzed further to ultimately select a preferred alternative. The range of alternatives for a project should address the possible impacts and operational characteristics of the proposed project. Constructing a project as a P3 or toll facility may or may not have distinct environmental and social impacts. If the effects of a P3 are environmentally neutral, in theory they do not need to be separately addressed. Nevertheless, failure to discuss the possibility of project implementation through a P3 can lead to later public concern. Public perception may also play a role if P3 implementation is not openly discussed. As noted in ENV-3, in some cases it may be appropriate to consider only toll or P3 alternatives. FHWA's Office of the Chief Counsel issued guidance on the appropriate scope of an alternatives analysis and specifically indicated that tolling should be analyzed. Chapter 6 discussed further NEPA alternatives analysis and P3s and tolling.

The level of analysis, as required when a P3 or toll road option is introduced after issuance of a ROD or FONSI, is affected by the level and nature of the analysis originally undertaken. The question at that time is whether P3 implementation can result in significant differences in the project or in its impacts from those addressed in the original EIS. When, as is often the case, there are no significant differences, a supplemental EIS may not be required.

ENV-8 to ENV-14—Approval Processes

These steps in the environmental review phase include the following:

- ENV-8—Approve Draft EIS with Conceptual Mitigation: The DEIS is approved and circulated for public review.
- ENV-9—Approve Resource Agency Public Notice: This step satisfies the Section 404 permitting regulatory requirement that the public receive notice of application.

- ENV-10—Approve Preferred Alternative/Least Environmentally Damaging Practicable Alternative: The preferred alternative is approved with stakeholder input; a consistency check is made with the LRTP and TIP/STIP.
- ENV-11—Approve Final Jurisdictional Determination: A final determination is made under the Section 404 program.
- ENV-12—Reach Consensus on Avoidance and Minimization for the LEDPA: Consensus is reached on additional avoidance and minimization measures not included in the preliminary design.
- ENV-13—Approve Final EIS: The FEIS is approved that meets all legal requirements and addresses comments received on the draft EIS.
- ENV-14—Approve Record of Decision: The ROD is issued.

These steps in the Decision Guide represent the formal stages of the NEPA process involving approval of the DEIS, selection of the preferred alternative, approval of the final NEPA document, and approval of the FONSI or ROD. Although a FONSI is typically not an extended statement, a ROD for a complex project can be quite lengthy, setting forth the basis of the project decision. In the case of a toll or P3 project, the ROD provides the project sponsor the opportunity to make its case for proceeding with the project using a partnership approach.

A particular focus for a potential P3 project is to ensure that the documentation either directly addresses the impacts associated with implementation through a P3 or contains enough information to be able to anticipate what those impacts might be. Chapter 4 in the section on awarding early construction contracts in strategic instances, discusses how to determine the appropriate level of design during NEPA and its effect on P3 consideration. As discussed in the final report, private investors may be unwilling to participate in the NEPA process itself because of cost and risk issues. Regardless of whether a P3 developer participates in the process, it is recommended that any possible impacts of P3 implementation be addressed to avoid the potential of a supplemental EIS, which can be disruptive, cause unanticipated delays, and result in additional costs. Steps can be taken to anticipate the design flexibility private partners desire when participating in project implementation post-NEPA, as referenced earlier for ENV-4 and ENV-5.

ENV-15—Render Permit Decision and Approve Avoidance and Minimization

At this final step in the environmental review process, permits for the project are approved, approved with conditions, or denied. In the case of a P3, the responsibility for obtaining permits after the ROD may fall to the public sponsor or the private partner and could impact the cost of the project if delay is incurred in obtaining them. Chapter 5 discussed the disadvantages that a private partner might face with obtaining permits from resource agencies accustomed to interacting with public-sector agencies.

References

American Association of State Highway and Transportation Officials, AASHTO Center for Excellence in Project Finance Website. http://www.transportation-finance.org/. Accessed April 19, 2012.

Buxbaum, J. N., and I. N. Ortiz. 2009. *NCHRP Synthesis of Highway Practice 391: Public Sector Decision Making for Public-Private Partnerships: A Synthesis of Highway Practice.* Transportation Research Board of the National Academies. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_391.pdf.

Center for Environmental Excellence by AASHTO. NEPA Process Overview. http://environment.transportation.org/environmental_issues/nepa_process/. Accessed April 19, 2012.

Commonwealth of Virginia. *Public-Private Transportation Act of 1995 (as Amended): Implementation Manual and Guidelines.* http://www.virginiadot.org/business/resources/PPTA/PPTA_Implementation_Manual_FINAL_December_10_2010.pdf. Accessed Dec. 8, 2010.

Council on Environmental Quality. *National Environmental Policy Act.* Executive Office of the President. http://ceq.hss.doe.gov/welcome.html. Accessed April 19, 2012.

Council on Environmental Quality. *Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations: Question 2A.* Executive Office of the President. http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm. Accessed March 16, 1981.

Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. 2007. *The Transportation Planning Process Key Issues: A Briefing Book for Transportation Decisionmakers, Officials, and Staff,* Publication No. FHWA-HEP-07-039. September. http://www.planning.dot.gov/documents/BriefingBook/bbook_07.pdf.

Federal Highway Administration, Office of Innovative Program Delivery P3 Website. http://www.fhwa.dot.gov/ipd/p3/defined/index.htm. Accessed April 19, 2012a.

Federal Highway Administration, Office of Innovative Program Delivery P3 Website. Tools & Programs: SEP-15. http://www.fhwa.dot.gov/ipd/p3/tools_programs/sep15.htm. Accessed April 19, 2012b.

Federal Highway Administration, Office of Innovative Program Delivery TIFIA Website. http://www.fhwa.dot.gov/ipd/tifia/projects_case_studies/index.htm. Accessed April 19, 2012c.

Federal Highway Administration, U.S. Department of Transportation. NEPA Documentation: Environmental Impact Statement. *Environmental Review Toolkit: NEPA and Project Development.* http://www.environment.fhwa.dot.gov/projdev/docueis.asp. Accessed April 19, 2012d.

Federal Highway Administration, U.S. Department of Transportation. Legislation, Regulations and Guidance. *Environmental Review Toolkit: Planning and Environment Linkages.* http://environment.fhwa.dot.gov/integ/related.asp. Accessed April 19, 2012e.

Federal Highway Administration, U.S. Department of Transportation. NEPA Documentation: Environmental Assessment. *Environmental Review Toolkit: NEPA and Project Development.* http://www.environment.fhwa.dot.gov/projdev/docueis.asp. Accessed April 19, 2012f.

Federal Highway Administration, U.S. Department of Transportation. Supplement to January 28, 2008, Transportation Planning Requirements and Their Relationship to NEPA Process Completion. Feb. 9, 2011. http://www.fhwa.dot.gov/planning/tprandnepasupplement.htm.

Federal Highway Administration, Office of the Chief Counsel, U.S. Department of Transportation. Alternatives Analyses White Paper. http://www.fhwa.dot.gov/everydaycounts/pdfs/altsanalysespaperhccwhitepaperwebversion9_22_10.pdf. Accessed Sept. 22, 2010.

Federal Highway Administration, U.S. Department of Transportation. Financial Planning and Fiscal Constraint for Transportation Plans and Programs: Questions & Answers. http://www.fhwa.dot.gov/planning/fsclcntrntques.htm. Accessed April 15, 2009.

Federal Highway Administration, U.S. Department of Transportation. *User Guidebook on Implementing Public-Private Partnerships for Transportation Infrastructure Projects in the United States.* http://www.fhwa.dot.gov/ipd/pdfs/ppp_user_guidebook_final_7-7-07.pdf. Accessed July 7, 2007.

Federal Highway Administration, U.S. Department of Transportation. *SAFETEA-LU Environmental Review Process Final Guidance.* http://www.fhwa.dot.gov/hep/section6002/section6002.pdf. Accessed Nov. 15, 2006.

Federal Highway Administration, U.S. Department of Transportation. Memorandum from D. J. Gribbin (Chief Counsel) to Peggy Catlin (Deputy Executive Director, Colorado Department of Transportation). http://www.environment.fhwa.dot.gov/guidebook/NEPA_tollroads.asp. Accessed Oct. 15, 2004.

Hart, A. Plan would fund I-75/I-575 toll project. *The Atlanta Journal-Constitution.* http://www.ajc.com/news/georgia-government/plan-would-fund-i-1328792.html. Accessed Feb. 2, 2012.

HNTB Corporation. 2010. *Atlanta Regional Managed Lane System Plan Technical Memorandum 11: Implementation Strategy.* January. http://www.dot.ga.gov/informationcenter/programs/studies/managedlanes/Documents/Implementation%20Strategy.pdf.

ICF International. Transportation for Communities: Advancing Projects through Partnerships Website, Applications—Long Range Transportation Planning. http://www.transportationforcommunities.com/shrpc01/framework_application_kdps/6/0. Accessed April 19, 2012a.

ICF International. Transportation for Communities: Advancing Projects through Partnerships Website, Applications—Environmental Review Merged With Permitting. http://www.transportationforcommunities.com/shrpc01/framework_application_kdps/8/0. Accessed April 19, 2012b.

ICF International and URS Corporation. 2014. *SHRP 2 Report S2-C01-RR-1: Framework for Collaborative Decision Making on Additions to Highway Capacity.* Transportation Research Board of the National Academies, Washington, D.C. http://www.trb.org/Main/Blurbs/166046.aspx.

KCI Technologies, Inc. 2005. *Current Practices in Public-Private Partnerships for Highways: Executive Summary.* July. http://www.mdta.maryland.gov/About/documents/ExecSumm.pdf.

King, M. 2012. "Full text of Gov. Nathan Deal's State of the State address." 11 Alive. Jan. 11, 2012. http://www.11alive.com/news/article/221491/40/Full-text-of-Gov-Nathan-Deals-State-of-the-State-address.

North Central Texas Council of Governments. 2011. *Mobility 2035: The Metropolitan Transportation Plan for North Central Texas.* March. http://www.nctcog.org/trans/mtp/2035/M2035Document.pdf.

Office of Transportation Public-Private Partnerships. 2011a. *PPTA Value for Money Guidance.* April. http://www.vappta.org/resources/VDOT%20VfM%20guidance%20document_final_20110404.pdf.

Office of Transportation Public-Private Partnerships. 2011b. *PPTA Risk Analysis Guidance.* September. http://www.vappta.org/resources/PPTA%20Office%20Risk%20Guidance%20Document%20v2.1%2020110930.pdf.

Papernik, B. G., and D. J. Farkas. Using Alternative Technical Concepts to Improve Design-Build and PPP Procurements. Nossaman LLP E-Alerts. http://www.nossaman.com/using-alternative-technical-concepts-improve-designbuild-ppp. Accessed March 31, 2009.

Parsons Brinckerhoff, Inc. 2009. *Improved Framework and Tools for Highway Pricing Decisions, NCHRP 08-57.* Transportation Research Board of the National Academies, Washington, D.C.

Perez, B. G. 2004. *Achieving Public-Private Partnership in the Transport Sector,* iUniverse Inc., Bloomington, Ind.

Pratt, K. Drivers React to Changes to HOT Lane Fees. Myfoxatlanta. http://www.myfoxatlanta.com/dpp/news/local_news/Drivers-React-to-Changes-in-HOT-Lane-Fees-20111007-am-sd. Accessed Oct. 7, 2011.

Rall, J. 2012. *Public-Private Partnerships for Transportation: A Toolkit for Legislators March 2012 Updates and Corrections,* National Conference of State Legislatures. http://www.ncsl.org/documents/transportation/PPPTOOLKIT-update-March2012.pdf.

Rall, J., J. B. Reed, and N. J. Farber. 2010. *Public-Private Partnerships for Transportation: A Toolkit for Legislators,* National Conference of State Legislatures. October. http://www.ncsl.org/documents/transportation/PPPTOOLKIT.pdf.

Samuel, P. Greenville SC Southern Connector toller files for bankruptcy. *TOLLROADSnews.* http://www.tollroadsnews.com/node/4808. Accessed June 25, 2010.

U.S. Department of Transportation. *Innovation Wave: An Update on the Burgeoning Private Sector Role in U.S. Highway and Transit Infrastructure.* http://www.fhwa.dot.gov/reports/pppwave/ppp_innovation_wave.pdf. Accessed July 18, 2008.

Wickert, D. HOT lane concerns dominate town hall meeting. *The Atlanta Journal-Constitution.* http://www.ajc.com/news/gwinnett/hot-lane-concerns-dominate-1209213.html. Accessed Oct. 24, 2011.

APPENDIX A

Glossary

alternative: One of a number of specific transportation improvement proposals, alignments, options, or design choices in a defined study area. (Source: TCAPP)

availability payment: A periodic payment made to a concessionaire by a public authority for providing an available facility. Payments are reduced if the facility is not available for a period of time, or not being maintained in satisfactory condition. Using an availability payment structure eliminates the need for the concessionaire to assume any traffic risk and protects the interests of the public by giving the concessionaire a financial incentive to maintain the facility in satisfactory condition and operating at a specified level of performance. (Source: FHWA)

capital improvement: Local planning for the addition of infrastructure such as roads, bridges, water and sewer systems, and other structures. (Source: TCAPP)

cash flow model: A valuation method used to estimate the attractiveness of an investment opportunity. Discounted cash flow (DCF) analysis uses future free cash flow projections and discounts them (most often using the weighted average cost of capital) to arrive at a present value, which is used to evaluate the potential for investment. (Source: Investopedia.com)

categorical exclusion: An NEPA finding documenting that a proposed transportation improvement does not individually or cumulatively create a significant effect on the human environment and for which neither an environmental assessment nor an environmental impact statement is required. (Source: FHWA)

collaboration: To cooperate with others in a joint endeavor or area of mutual interest to influence or affect the outcome. (Source: TCAPP)

collaborative decision-making framework: Series of key decisions properly sequenced and detailed to support collaborative decisions for capacity projects. (Source: TCAPP)

concession: A contractual agreement whereby a public agency engages a private development partner to design, build, finance, operate, and maintain a highway improvement for a specified time period in exchange for the right to collect tolls on the facility or receive availability payments.

concession period: This is the duration of a concession.

concurrence: This is a formal agreement among parties that is documented by the decision makers. (Source: TCAPP)

conformity: An MPO-led process to ensure that federal funding and approval go to transportation activities that are consistent with air quality goals. Conformity applies to transportation plans, transportation improvement programs, and projects funded or approved by the Federal Highway Administration or the Federal Transit Administration in areas that do not meet, or previously have not met, air quality standards for ozone, carbon monoxide, particulate matter, or nitrogen dioxide. These areas are known as "nonattainment areas" or "maintenance areas," respectively. (Source: FHWA)

congestion pricing: This is a variation on tolling, in which user fees for a transportation facility vary based on the level of traffic volume or the time of day. It is also known as "variable pricing." (Source: NCSL)

cooperating agency: Any federal agency other than a lead agency that has jurisdiction by law or special expertise with respect to any environmental impact involved in a proposal (or a reasonable alternative) for legislation or other major federal action significantly affecting the quality of the human environment. A state agency or local agency of similar qualifications or, when the effects are on a reservation, an Indian tribe may by agreement with the lead agency become a cooperating agency. (Source: CEQ)

corridor planning process: This is a procedure usually done when the long-range transportation plan leaves open the possibility of multiple approaches to fulfill goals and objectives and before the environmental review process. (Source: TCAPP)

credit enhancement: Financing tools (e.g., letters of credit, lines of credit, bond insurance, debt service reserves, and

debt service guarantees) that improve the credit quality of underlying financial commitments. Credit enhancements have the effect of lowering interest costs and improving the marketability or liquidity of bond issues. (Source: AASHTO)

Decision Guide: A framework of the key decisions in long-range planning, programming, corridor planning, and environmental review phases that includes the information needed to support collaboration and other important topics. The Decision Guide is the foundation for all concepts presented in TCAPP, now known as PlanWorks. (Source: TCAPP)

design–build: A procurement or project delivery arrangement in which a single entity (a contractor with subconsultants or a team of contractors and engineers, often with subconsultants) is entrusted with both design and construction of a project. This contrasts with traditional procurement where one contract is bid for the design phase and then a second contract is bid for the construction phase of the project. (Source: AASHTO)

design–build–finance–operate–maintain (DBFOM): A procurement approach in which the responsibilities for designing, building, financing, operating, and maintaining highway improvements are bundled together and transferred to private-sector partners. DBFOM projects are either partly or wholly financed by debt leveraging revenue streams dedicated to the project. Direct user fees (tolls) are the most common revenue source; other sources include lease payments, shadow tolls, and vehicle registration fees. Future revenues are leveraged to issue bonds or other debt that provide funds for capital and project development costs. They are also often supplemented by public-sector grants in the form of money or contributions in kind, such as right-of-way. Private partners are normally required to make equity investments as well. (Source: FHWA)

environmental assessment: A concise public document for which a federal agency is responsible, used to determine whether to prepare an environmental impact statement for a proposed transportation improvement or issue a finding of no significant impact. An environmental assessment includes a brief discussion of the need for the proposed improvement, a listing of conceptual alternatives, a discussion of anticipated environmental impacts of the proposed action and alternatives, and a listing of agencies and persons consulted. (Source: FHWA)

environmental impact statement (EIS): NEPA requires federal agencies to prepare environmental impact statements for major federal actions that significantly affect the quality of the human environment. An EIS is a full-disclosure document that details the process through which a transportation project was developed, includes consideration of a range of reasonable alternatives, analyzes the potential impacts resulting from the alternatives, and demonstrates compliance with other applicable environmental laws and executive orders. The EIS process is completed in the following ordered steps: notice of intent, draft EIS, final EIS, and record of decision. (Source: FHWA)

environmental review: The process during which proposed transportation improvement projects are examined with respect to the impacts to natural and human communities. (Source: TCAPP)

Federal Highway Administration: The division of the U.S. Department of Transportation charged with overseeing the development of highway infrastructure.

financial plan: The nexus in which project costs and expected outlays during construction are benchmarked against the revenue generation potential of a project, the debt that such revenue can leverage, and other available funding variables. As such, they are an operative tool for determining whether projects are actually affordable.

finding of no significant impact: A finding of no significant impact is issued when environmental analysis and interagency review during the environmental assessment process find a project to have no significant impacts on the quality of the environment. (Source: FHWA)

fiscal constraint: A demonstration of sufficient funds (federal, state, local, and private) to implement proposed transportation system improvements, as well as to operate and maintain the entire system, through the comparison of revenues and costs. For additional information, access http://www.fhwa.dot.gov/planning/fcdef62805.htm. (Source: TCAPP)

fiscally constrained: A fiscally constrained plan identifies revenues that are reasonably expected to be available to implement the plan while still providing operations and maintenance of the existing transportation infrastructure. (Source: TCAPP)

HOT lanes: Managed highway lanes open to buses and high-occupancy vehicles at no cost, as well as non-HOV vehicles that pay a variably priced toll. Tolls are adjusted using fixed or dynamic rates to maintain free-flow traffic conditions.

lead agency: The agency or agencies preparing, or having taken primary responsibility for preparing, the environmental impact statement. (Source: CEQ)

lead federal agency: This is the federal agency taking primary responsibility for reviewing and approving an EIS.

long-range transportation plan: A mandated federal procedure by which state and metropolitan transportation planning organizations develop a multimodal long-range transportation plan that evaluates the current status of the regional transportation system or identifies necessary improvements to the system and guides the advancement of the system for at least 20 years in the future. (Source: TCAPP)

metropolitan planning organization (MPO): An MPO is the local transportation planning entity responsible for

planning, programming, and coordinating federal highway and transit investments. Federal transportation statutes require that urbanized areas of 50,000 people or more must designate an MPO as a condition for spending federal highway or transit funds. MPOs are responsible for maintaining a long-range transportation plan, a transportation improvement plan, and a regional travel demand model, as well as completing conformity analysis.

metropolitan transportation plan: A federally mandated, MPO-led metropolitan planning process required in urbanized areas in the country with populations of more than 50,000 to identify transportation needs and policy over a 20-year horizon.

National Environmental Policy Act (NEPA): A federal environmental policy that establishes a process by which federal agencies must study the environmental effects of their proposals, document the analysis, and make the information available to the public for comment. For transportation projects, NEPA requires examination and avoidance of potential impacts to the social and natural environment when considering approval of proposed projects. It provides an interdisciplinary framework for federal agencies to prevent environmental damage and contains "action-forcing" procedures to ensure that federal agency decision makers take environmental factors into account. For additional information, access http://www.environment.fhwa.dot.gov/projdev/index.asp. (Source: TCAPP)

nonattainment area: Metropolitan areas of the country where air pollution levels persistently exceed the national ambient air quality standards. (Source: EPA)

objective opportunity: Specific and measureable statements related to the attainment of goals. An objective opportunity is a potential action within a corridor that has the ability to improve the corridor's transportation system performance. (Source: TCAPP)

obligation authority: The amount of budgetary resources (including new budget authority, balances of unobligated budget authority carried over from previous years, and obligation limitations) available for obligation in a given fiscal year. Within the federal-aid highway program, obligation authority often refers to the amount of federal-aid obligation limitation, established annually by Congress in appropriation acts, that is allocated to the states and controls the amount of apportioned contract authority that can be obligated by the states in a given fiscal year. (Source: AASHTO)

participating agency: SAFETEA-LU defines participating agencies as those with an interest in NEPA projects, as opposed to cooperating agencies, which are federal regulatory agencies with jurisdiction over environmental issues and permits. The roles and responsibilities of cooperating and participating agencies are similar, but cooperating agencies have a higher degree of authority, responsibility, and involvement in the environmental review process. (Source: CEQ)

pay-as-you-go financing: Government financing of capital outlays from current revenues or grants rather than by borrowing. (Source: AASHTO)

performance measure: Indicators of how well the transportation system is performing with regard to both qualitative and quantitative measurements. Sometimes used as feedback in the decision-making process. (Source: TCAPP)

PlanWorks: See *Transportation for Communities—Advancing Projects through Partnerships.*

practitioner: An individual professional who is directly involved in support of the transportation decision-making process in an ongoing manner. (Source: TCAPP)

predevelopment agreement: An agreement that allows private development partners to participate in the preliminary design of a project during the environmental review process at either a reduced or a deferred cost, in exchange for the right of first refusal to develop the project on a design–build–operate–maintain or design–build–finance–operate–maintain basis.

preferred alternative: The NEPA alternative that the project sponsor believes would fulfill its statutory mission and responsibilities, giving consideration to economic, environmental, technical, and other factors. The concept of the "agency's preferred alternative" is different from the "environmentally preferable alternative," although in some cases one alternative may be both. (Source: CEQ)

principal: Cash provided by a private borrower to obtain a loan and later recovered from project revenues after most other debt obligations have been paid off.

private activity bonds: Private activity bonds are a form of tax-exempt bond financing that can be issued by or on behalf of state or local governments for privately developed and operated projects. This gives private entities access to tax-exempt interest rates. Under SAFETEA-LU, the total amount of such bonds is limited to $15 billion. (Source: NCSL/FHWA)

problem statement: A statement outlining the underlying causes of the corridor or regional problems (not just transportation related but also economic, natural, cultural), and written in such a way that the statement is useful for development and evaluation of potential solutions. Problem statements should avoid being mode-specific, although they can relate a specific type of vehicle to the problem. For additional information, access http://www.contextsensitivesolutions.org/content/reading/problem-definition-3/. (Source: TCAPP)

procurement: The process on the part of project sponsors for obtaining services related to the implementation of highway improvement projects. Procurement processes for large highway improvement and P3 projects normally include a

request for qualifications, after which the project sponsor invites a shortlist of the most qualified bidders to submit detailed proposals. See *project delivery*.

project concepts: A transportation improvement idea that, when advanced through the stages of planning, environment, design, and construction, would satisfy an identified need and was considered in the context of the local area socioeconomics and topography, future travel demand, and infrastructure improvements in the area. (Source: TCAPP)

project definition: This is the act of assessing alternative designs and alignments for highway improvements and identifying a preferred, approved alternative, with a categorical exclusion (CE), finding of no significant impact (FONSI), or record of decision (ROD).

project delivery: This is the act of procuring private-sector services. See *procurement*.

project development: The general process of seeing a transportation project from the beginning (when a need is identified from an existing plan and then the plan is programmed) through to the end (when the plan is approved for implementation). (Source: TCAPP)

project sponsor: A public-sector agency is an agency that advances and procures a transportation improvement project.

public affairs: A term used to describe an organization's relationship with stakeholders with an interest in the organization's undertakings and operations. Public affairs practitioners engage stakeholders in order to explain the organization's policies, provide factual information, and gain support on issues that could affect the organization's ability to operate successfully. The field of public affairs combines government relations, media communications, issue management, information dissemination, and strategic communications advice. (Source: publicaffairsnet working.com)

public outreach: Public outreach is the act of communicating and engaging with the public to inform them about an agency's activities (e.g., the development of highway improvements) to gain feedback and support.

public–private partnership (P3): A contractual agreement formed between public-sector and private-sector partners, which allows more private-sector participation than is traditional. The agreement usually involves a government agency contracting with a private company to renovate, construct, operate, maintain, and/or manage a facility or system. Although the public sector usually retains ownership in the facility or system, the private party will be given additional decision rights in determining how the project or task will be completed. In some P3s, the private sector may also finance some or all of a project. (Source: FHWA)

public-sector comparator: A procedure used by governments to make decisions by testing whether a private investment proposal offers value for money in comparison with the most efficient form of public procurement. (Source: The World Bank)

purpose and need statement: A brief written statement specifying the underlying purpose and need to which the agency is responding in proposing alternatives included in an EIS. Purpose and need statements articulate the objectives that the proposed transportation improvements are designed to achieve. EIS analyses assess the ability of different project alternatives to meet the objectives established in the purpose and need statement. (Source: CEQ)

real toll concession: A concession awarded to a private development partner to design, build, finance, and operate a transportation project for a predetermined concession period in exchange for the right to collect all revenues generated by the project during the concession period. (Source: FHWA)

record of decision: A federal environmental decision document issued by FHWA approving an EIS and explaining the basis for the project decision, and summarizing mitigation measures incorporated into the project. (Source: TCAPP)

regional plan: See *metropolitan transportation plan*.

resource agencies: Federal agencies with regulatory and/or permitting authority related to protection of natural or cultural resources. Examples include (but are not limited to) the U.S. Environmental Protection Agency (EPA) and U.S. Army Corps of Engineers. (Source: TCAPP)

revenue bond: Bonds issued by the public sector to finance the construction or maintenance of a transportation facility. Unlike general obligation bonds, these are not backed by the full faith and credit of the government but, rather, depend on revenues from the roadway they finance. (Source: NCSL)

Second Strategic Highway Research Program (SHRP 2): A research program authorized by Congress to address some of the most pressing needs related to the nation's highway system: the high toll taken by highway deaths and injuries, aging infrastructure that must be rehabilitated with minimum disruption to users, and congestion stemming both from inadequate physical capacity and from events that reduce the effective capacity of a highway facility. These needs define the four focus areas in SHRP 2:

- The Safety area is conducting the largest ever naturalistic driving study to better understand the interaction among various factors involved in highway crashes (e.g., driver, vehicle, and infrastructure), so that better safety countermeasures can be developed and applied to save lives.
- The Renewal area is developing technologies and institutional solutions to support systematic rehabilitation

of highway infrastructure in a way that is rapid, presents minimal disruption to users, and results in long-lasting facilities.
- The Reliability area is developing basic analytical techniques, design procedures, and institutional approaches to address the events (e.g., crashes, work zones, special events, and inclement weather) that result in the unpredictable congestion that makes travel times unreliable.
- The Capacity area is developing a web-based tool to provide more accurate data and collaborative decision making in the development of new highway capacity to expedite the provision of that capacity while simultaneously addressing economic, community, and environmental objectives associated with new construction.

SHRP 2 is administered by the Transportation Research Board of the National Academies under a Memorandum of Understanding with the Federal Highway Administration and the America Association of State Highway and Transportation Officials. (Source: SHRP 2)

social media: Forms of electronic communication (such as websites for social networking and for microblogging) through which users create online communities to share information, ideas, personal messages, and other content, including videos. (Source: Merriam-Webster)

Special Experimental Project 15 (SEP-15): An experimental FHWA process to identify and test new public–private partnership approaches to project delivery. These new approaches facilitate the efficient delivery of transportation projects without impairing the FHWA's ability to carry out its stewardship responsibilities to protect both the environment and American taxpayers.

SEP-15 addresses but is not limited to four major components of project delivery: contracting, compliance with environmental requirements, right-of-way acquisition, and project finance. (Source: FHWA)

stakeholder: A stakeholder is a person or group that may be affected by a transportation plan, program, or project. Stakeholders may include government agencies that are not part of the decision-making partnership, formal advocacy groups, and informal groups that come together around transportation decision making (i.e., neighborhood associations). (Source: TCAPP)

state department of transportation: State public agencies charged with the maintenance, operation, and development of highway and transportation infrastructure.

state transportation improvement program (STIP): A state transportation improvement program identifying which projects in the MTP/SLRP are to be completed in the coming 4-year cycle.

study area: The area of analysis defined in a NEPA document for a highway improvement project.

toll: A fee paid by motorists to use a limited-access highway facility, often used to cover the costs of construction and operations.

Transportation for Communities—Advancing Projects through Partnerships: A decision support tool, now known as PlanWorks, developed through the SHRP 2 Capacity Series focused on a series of 44 decision points in the planning and NEPA processes that shape project outcomes encouraging collaboration and effective and informed decision making. (Source: TCAPP)

transportation improvement program: Near-term transportation investment programs maintained by MPOs identifying which projects in the MTP/SLRP are to be completed in the upcoming 4-year cycle.

The Transportation Infrastructure Finance and Innovation Act of 1998: Federal credit program for eligible transportation projects authorizing U.S. DOT to provide three forms of credit assistance: secured (direct) loans, loan guarantees, and standby lines of credit. The fundamental goal is to leverage federal funds by attracting substantial private and other nonfederal co-investment. (Source: FHWA)

unsolicited offer: Unsolicited proposals from private-sector developers to public-sector transportation agencies to design, build, finance, operate, and maintain transportation improvement projects. The ability for an agency to consider unsolicited offers is normally promulgated in state law.

value engineering: Value engineering is an organized application of common sense and engineering and technical knowledge directed at finding and eliminating unnecessary costs in a project. (Source: FHWA)

value for money analysis: An assessment of the monetary value of net life-cycle costs and quality to determine the benefits achieved by using a P3 procurement process relative to public project delivery, also taking into account factors that cannot be expressed in monetary terms, such as any predicted differences in service quality between the delivery options. (Source: VDOT)

vision: Vision is a statement representing a community's desires for the future. (Source: TCAPP)

APPENDIX B

Literature Review and Additional P3 Resources

General Guidance and Research Reports

General guidance documentation available to assist in screening P3 opportunities was reviewed with the objective of relating P3 opportunities to the decision points in the TCAPP, now known as PlanWorks, Decision Guide. For the most part, existing literature discussing use of P3s as a possible project delivery tool either provides a broad overview (FHWA 2007; Rall et al. 2010)—as in the case of a state without P3 experience—or focuses on specific analyses performed when weighing the decision to use a P3, for example, the best practices for performing value for money, or VfM, analyses (Williamson et al. 2011; Morallos et al. 2009; Buxbaum and Ortiz 2009). Given the relative inexperience with P3s in the United States and the concerns and skepticism that often accompany P3 projects (e.g., unease regarding foreign ownership of transportation assets or concern over private-sector control of a tolled roadway and its toll rates), it is not surprising that these two perspectives characterize the majority of existing literature and guidance (e.g., government sponsored, academic, industry).

A thorough synthesis of the literature as of early 2011, which covers a range of considerations when weighing the benefits and risks of applying a P3 approach, is in *National Cooperative Highway Research Program Synthesis 391, Public Sector Decision Making for Public–Private Partnerships* (*NCHRP Synthesis;* Buxbaum and Ortiz 2009). The literature reviewed in that synthesis generally is not re-reviewed here. It includes Federal Highway Administration (FHWA) resources; U.S. Government Accountability Office reports; studies by states, regions, and toll road authorities investigating P3 options; Transportation Research Board papers; academic and industry papers; and other resources. In addition, survey results were compiled by querying state DOTs and Canadian provincial counterparts on P3 decision making, including

1. Criteria used to select P3 projects;
2. Measures and/or strategies used to protect the public interest;
3. Level of importance of public concerns related to P3s;
4. Tools used by state DOTs to evaluate P3 proposals; and
5. Information provided to decision makers, including who provides.

The *NCHRP Synthesis* includes a summary of P3 valuation processes, which "should include the careful selection of inputs/variables that properly characterize the chosen procurement method and risk allocation, using quantitative methods that include sensitivity analysis to better assess the risk variables for a particular project." Tools that have been used in the United States include VfM, shadow bids and market valuation (Texas), and asset valuation (Chicago and Indiana). The study defines VfM as a financial model that "calculates the difference between the costs and benefits associated with both traditional and PPP procurements." Similarly, shadow bids are, "detailed estimates of design and construction costs, operating costs, and a detailed financial model" prepared by the state to compare with private-sector proposals.

VfM has seen widespread use internationally with some application also in the United States (e.g., Florida, Virginia, and Oregon). Often, to apply VfM, a public-sector comparator (PSC) model is developed, which attempts to capture the life-cycle project costs (construction, operations, maintenance, additional improvements) if the project were developed using traditional public resources and delivery methods. Then, "an estimate of VfM is achieved by calculating the present value of the PSC and . . . comparing it with one or more bids from private companies." It should be noted that the PSC approach has been criticized based on the premise that the elements associated with public versus private development are too different to allow a meaningful comparison.

The *NCHRP Synthesis* discussion notes that a project's scope needs to be advanced enough to make realistic estimates of the inputs required of the valuation process, many of which may be known or become pertinent only at stages or decision points past those identified in the TCAPP Decision Guide

(i.e., post-ROD), including advanced project design, value engineering results, and refined traffic and (toll) revenue studies. Estimates of life-cycle improvements and future expansions/extensions would be required of the P3 project planning process if these valuation tools are to be effective—estimates that are not necessarily captured in existing infrastructure planning processes. If they are, a high level of confidence would be required to make the valuation process credible. Indeed, criticism of the PSC and VfM techniques centers on their being an examination of only a hypothetical scenario, with varying degrees of uncertainty associated with the necessary inputs and assumptions. Overall, with respect to P3 valuation, the report concludes that "the most pressing research need surrounding PPPs is related to PPP valuation tools."

In attempting to synthesize the state of the practice of valuation tools, the *NCHRP Synthesis* concludes that other literature has found that "the industry would benefit from a compilation of existing valuation methodologies, a description of the advantages and disadvantages of each of these tools, sample applications, and the development of a framework that would help project sponsors to evaluate potential PPP deals objectively." Even so, many of these tools' applications may fall outside the Decision Guide's scope.

Among concerns raised over P3s—identified in *NCHRP Synthesis*—are issues of environmental safeguards and the environmental review process that occur during the planning process. Concerns exist that private-sector interests can limit or bypass the environmental review process, and the extent to which safeguards are put in place in response to any one issue could be deemed inadequate or compromised. Of course, any use of federal funding would require the project to comply with NEPA, and many states have their own environmental laws and requirements that afford similar protections. However, one of the *NCHRP Synthesis* survey responders recommended that P3 project approval not occur until after the completion of the NEPA process to "ensure the unbiased analysis of project alternatives and environmental impacts," among other reasons.

In addition, one principal result of the survey was a concern that private investors could circumvent the planning process when submitting unsolicited proposals, because they would represent only the most profitable projects that, at the same time, may not be the highest priority for the public. One response to this assertion is that safeguards to protect the public interest need to be in place, and if the proposal is not deemed to be in the public's best interest, there is no need to consider it. A simple mitigation is to require all proposed projects to be consistent with state, local, and MPO transportation plans. Allowing sufficient time for the submission of competing proposals would also help to alleviate these concerns.

Other concerns that may occur earlier in the P3 development process (e.g., before beginning the procurement process) and consequently may overlap or affect the decision points in the Decision Guide include early cost considerations, such as

1. Higher private-borrowing costs;
2. Foregone tax revenue on tax-exempt debt;
3. Cost of reviewing unsolicited proposals;
4. Cost of contracting financial and legal advisors or developing expertise in house;
5. Cost of performance monitoring; and
6. Cost of a project warranty (contractor includes contingency funds).

Each of these considerations could represent a critical decision point regarding whether a P3 is an appropriate choice for a project in question. Alternatively, assuming a P3 is the likely project delivery option, a project's scope and the later stages of its planning could be affected by changes deemed necessary to accommodate any one of these considerations and mitigate their negative consequences.

Beyond the *NCHRP Synthesis,* two comprehensive guidance documents on the use of P3s are worth noting: FHWA's *User Guidebook on Implementing Public–Private Partnerships for Transportation Infrastructure Projects in the United States* (FHWA 2007) and the National Conference of State Legislatures' (NCSL) *Public–Private Partnerships for Transportation: A Toolkit for Legislators* (Rall et al. 2010). The FHWA guide (included in the *NCHRP Synthesis*) is "aimed at both the early practitioners of PPP projects as well as those agencies just beginning to consider the possibility [of] instituting some form of PPP arrangement . . ." whereas the toolkit has been prepared for state legislators as they consider whether and how they pursue P3s in their states.

The FHWA *User Guidebook* is often cited among the literature and offers a broad overview of P3s, including a rationale for considering P3 approaches and definitions, and applications of different forms of P3s. In terms of screening a P3 opportunity, the document first lays out various criteria for evaluating the suitability of a P3 as a project delivery tool from a general perspective, as well as the perspectives of public sponsors and private entities. The general criteria cited include

1. Legal authority and stakeholder desire;
2. Demonstrated transportation need;
3. Sponsoring agency lacking resources;
4. Strong commitment by key stakeholders;
5. Large and complicated project;
6. Adequate funding potential;
7. Strong partner relationships; and
8. Level playing field for bidding teams.

These criteria require additional context and specific application to understand their impact on the transportation

planning process decision points. The document identifies criteria "to determine if a project is suitable for delivery as a PPP project." This information is replicated in Table B.1, which demonstrates that four primary considerations tend to drive P3 project selection: project scale, public/stakeholder demand, project stage and risk profile, and project revenue and funding potential. Several criteria in the matrix relate directly to the planning process (e.g., obtaining public and political support and including the project in state and local transportation improvement plans). However, throughout the FHWA *User Guidebook,* many of these lists of criteria lack specific context and explanation on how one would go about applying them in practice. Specifically, the FHWA *User Guidebook* lacks a discussion on the timing and duration of decision points, whether the discussion relates to a single P3 project, a program of P3 projects, or both, and how the process or considerations would change once legal authority or a P3 program is put in place. Therefore, it is difficult to extract specific decision points and relate them to the Decision Guide.

The NCSL's *A Toolkit for Legislators* offers a perspective on making policy decisions related to P3, but by taking a broad-based, high-level approach suffers from the same limitations as the FHWA *User Guidebook.* The toolkit provides key definitions and characteristics of P3s and summarizes the expected benefits, concerns, and controversies from applying a P3 approach. Accompanying that background, the focus of the toolkit is a set of nine principles for state legislators to follow when making policy decisions. They are presented as "general good governance principles that can support legislative decision making about whether and how to involve the private sector . . . [in] providing transportation infrastructure." The

Table B.1. FHWA* User Guidebook *Table of Criteria

Threshold Criteria for Considering P3s		Decision Factors for Selecting P3 Approach	
Project Scale	**Public/Stakeholder Demand**	**Project Stage and Risk Profile**	**Project Revenue and Funding Potential**
Project size in terms of cost and financing requirements—the higher the cost, the more likely the private sector will be needed to bridge the financing gap.	Urgency of project to satisfy transportation mobility need.	Preliminary concept planning favors joint development and life-cycle P3 approaches that maximize potential for cost minimization and value-capture maximization.	Scarce public funding sources to meet transportation program budgets are enhanced by pooling multiple modal program resources.
Project design and construction complexity—the more complex the design and the more sophisticated the financing, the greater the potential role of private partners.	Significant transportation-related economic development potential.	Public sector takes responsibility for environmental clearance, obtaining most permits, and most right-of-way acquisition, including advanced acquisition.	P3s enhance ability of project to secure adequate financing and funding to support the project's development based on user pricing and/or economic development value capture.
Project functional scope (whether financing and/or operations and maintenance are included)—the broader it is, the more likely private partners can leverage public resources to meet the needs.	Broad public support for P3 approach to project delivery, financing, and funding approaches used.	Design is at less than 30% to optimize best practice input by P3 team.	Legal authority must exist to permit sponsoring agency to engage in P3s that include use of private capital financing.
Capability of sponsoring public agency not adequate to deliver project by itself in a timely manner.	Broad and sustaining political support for P3 approaches to leverage scarce public funds and expedite project delivery.	Postconstruction responsibility for operations and maintenance and preservation transfers significant project performance risk to the P3 team through operations and maintenance contract or brownfield long-term concession lease.	Projects with high initial costs and long-range revenue potential require alternative financial approaches, which can be more readily obtained through a P3 arrangement.
Low-risk tolerance of sponsoring public agency for large, complex projects.	Presence of project in state or local transportation improvement plans (statewide transportation improvement program or transportation improvement program).	The greater the risks of the project and the public sponsor's aversion to risk, the more likely that a P3 approach will be considered.	Projects that lack financial feasibility will not attract private sector interest—therefore sponsoring agencies should not limit P3s to the least feasible projects.

Source: FHWA *User Guidebook.*

most germane to the evaluation of P3 opportunities is one principle that advises a legislator to "support comprehensive project analyses," which seek to show that a P3 is a better option than traditional project delivery. As discussed, these analyses refer to project valuation techniques (such as VfM and the use of a PSC), but given their limited application to date in the United States, their impacts on decision making during the planning process—assuming the analyses are undertaken early enough in the planning/project development process—are not well understood. Overall, the principles and recommendations included in the toolkit are designed to support state-level policy makers with limited knowledge and experience with P3s. They do not offer significant insight on potential impacts to the Decision Guide's decision points.

One additional feature of the NCSL's toolkit is Appendix B, which details state P3-enabling legislation including statute reference, the authorization's provisions, and whether legislative approval is needed for specific P3 projects. The list of enabling legislation was current as of October 2010 and was updated in a March 2012 Updates and Corrections addendum (Rall 2012).

One recent journal article on evaluating P3s that incorporates a planning focus that is not covered in the *NCHRP Synthesis* detailed earlier is "Delivering Transportation Infrastructure through Public–Private Partnerships: Planning Concerns" (Siemiatycki 2010). The article presents a "set of criteria on which to evaluate the procedural, spatial, design, public policy, and political implications of . . . PPPs from a planning perspective." As the author states, "there has been only limited examination of infrastructure PPPs through the disciplinary lens of planning."

To help close this gap, a set of nine criteria (six pertaining to short-term concerns and three pertaining to long-term concerns) are presented to assist planners in evaluating whether P3 project delivery is a proper tool to use by asking the following questions:

1. Will it tap new money for infrastructure?
2. Will it undermine systemwide planning?
3. Will it spur project-level innovation?
4. Will it limit meaningful community consultation and involvement?
5. Will the project be within budget and on time, meet traffic forecasts, and deliver desired community benefits?
6. Will supply and demand risks be transferred to the private partners?
7. Will DBFOM contracts constrain future options?
8. Will the P3 deliver value for public money?
9. Will conflict between the partners threaten project success?

The author then evaluates three P3 case studies (the SR 91 Express Lanes in Orange County, California, and two international P3s in the United Kingdom and Australia) against these criteria to examine how actual experience compared with the questions raised. The examination concluded that, in the short term, "private-sector involvement in project financing and delivery does not appear to have significantly distorted the government's regional planning objectives or investment priorities." Rather, a greater impact was felt at the "scale of project design and policy." The P3 project delivery model was found to disrupt the public involvement process and access to information and to limit accountability in decision making. The case studies also revealed that in the long term, "DBFOM PPP arrangements highlighted conflicts in planning objectives, demonstrating that maximizing private returns was sometimes, but not always, congruent with government social or environmental policy."

These findings raise valid points that may arise at decision points throughout the planning process; however, the impacts of these decisions were found to have a greater effect past the planning process as defined by the Decision Guide (e.g., during detailed project design and the negotiation and setting of contractual arrangements that transfer risks). Although the conclusions of this article offer a good starting point for evaluating P3s from a planning perspective, further research is required to better understand impacts on specific planning decision points and processes.

State Guidance Documents

The literature review also included a scan of state P3 program implementation guideline documents, policies and procedures manuals, rules, and other related documentation. The extent and detail of these documents vary considerably across state P3 programs, from marginally informative, with unclear decision points, to significantly detailed, with decision points clearly identified or at least made apparent. Of the states examined, a select group of four and their programs are summarized in Table B.2. The table lays out key information about each program, beginning with the source and timing of projects for consideration as a P3, through the compilation, prioritization, and selection of specific projects to advance to procurement, and on through the procurement process, including RFQ/RFP issuance and the negotiation with and selection of a P3 partner. The details provided for each of these categories summarize briefly the decision points and decision makers involved as the process advances, to the extent that information is made available in the documentation examined. Not all guidance on the programs presented in the table offers information on each of these topics.

Included among the four state programs in Table B.2 is the earliest and arguably most advanced P3 program—Virginia's Public–Private Transportation Act (PPTA) of 1995. A summary of earlier guidance dating from 2005 (Commonwealth of Virginia 2005) is presented alongside recently revised and reissued guidance from 2010 (Commonwealth of Virginia 2010). The new guidance was a response to an independent audit performed on the program and establishment of a new PPTA Office within the Virginia DOT. The revised program and guidance makes significant changes in identifying and articulating the decision points and details of the P3 process. In the earlier guidance, for example, it was not clear how projects were compiled, prioritized, or selected, nor was the NEPA process discussed with respect to the timing of the start of the procurement process and solicitation of proposals. In the newly reissued guidance, key decision points are identified, and it is easier to overlay or map steps in the transportation planning process to those laid out for P3 project consideration. Flowchart diagrams of the processes for solicited and unsolicited proposals and identification of decision points (taken directly from the Implementation Manual and Guidelines) are shown in Figures B.1a, B.1b, and B.1c.

The three other state programs shown in Table B.2 are Arizona's recently enacted P3 Program Guidelines issued in September 2010, Georgia's P3 Program Guidelines from February 2010, and the Louisiana Transportation Authority's P3 Program Guidelines issued in 2009. Louisiana's P3 program was created by statue in 2006. Georgia and Arizona's programs are newly established, and the procedures put forth in their respective guidelines have been done so through careful and deliberative processes. Louisiana is included because, although it has yet to procure a project through its P3 program, it offers another good example of guidance documentation for analysis and comparison purposes.

Taken as a whole, state P3 program documents, including those presented in Table B.2, reveal little about how P3s are to be considered during the planning process. For the most part, these documents refer to the compilation of potential projects that, under a certain set of stated criteria, can be put forth as a possible P3, either on a solicited basis from the state DOT (or other agency, local government, or MPO in some cases) or, frequently, on an unsolicited basis from a qualified private entity.

These guideline and procedure documents focus on institutional and procedural aspects of a P3 program, often outlining the roles and responsibilities of a P3 office, within or separate from the state DOT, specially established oversight or steering committees, and a state transportation board or secretary's office. Collaborative decision making often takes place among members of these specially composed committees (P3 program oversight or steering committees), with high-level approvals sought from a state transportation board or department secretary. The documents also tend to discuss at a high level the procedures and timing for prioritizing potential P3 projects, selecting them for development, and pursuing presolicitation and procurement activities, including the issuance of requests for information, RFQs, RFPs, holding industry forums and one-on-one meetings, and selecting and negotiating with a preferred partner.

With the exception of Virginia's program, the state P3 programs examined offer little insight on how decisions made during the planning process—including early project selection, prioritization, programming, and the application of the NEPA process—could be influenced by the consideration or selection of a P3. Guideline and procedure documents by their nature (and as described above) offer only a framework for implementing P3 projects (often in a linear, stepwise fashion) and do not consider the dynamics of the processes themselves. Some state guideline documents make only a brief mention of a list of projects for P3 consideration that could emanate from any qualified public agency during the planning process.

The specific case of an unsolicited proposal, where applicable, could have a significant impact on an environmental or decision-making process because timing for such proposals is not as strictly controlled as in the case of solicited proposals. This consideration could potentially lead to unforeseen changes to a project's status, either within a planning document (long-range plan, programmatic document) or a pre-ROD project development phase, or be proposed for the first time outside existing planning considerations. These considerations, however, are generally not addressed in state P3 program guidelines.

The P3 process flowcharts for Arizona (Figures B.2 and B.3) and Georgia (Figures B.4a and B.4b) are similar to those referenced earlier for Virginia. Like Virginia, Arizona's guidelines are accompanied by two flowcharts depicting the state's solicited and unsolicited P3 proposal processes. Georgia does not publish a flowchart of its process, but one has been constructed based on the procedures outlined in the state's P3 Guidelines. The flowcharts show that the processes are procedural in nature with distinct, linear steps. Generally they show a single path from start to finish and do not account for a P3's influence on the planning process. Indeed, most aspects of the planning process are assumed to be complete or incorporated as a static process early on, with a greater focus on process steps that take place following the selection of a particular project, including procurement, proposal evaluation, and contract award activities.

(text continues on page 95)

Table B.2. Overview of State P3 Programs in Arizona, Georgia, Louisiana, and Virginia

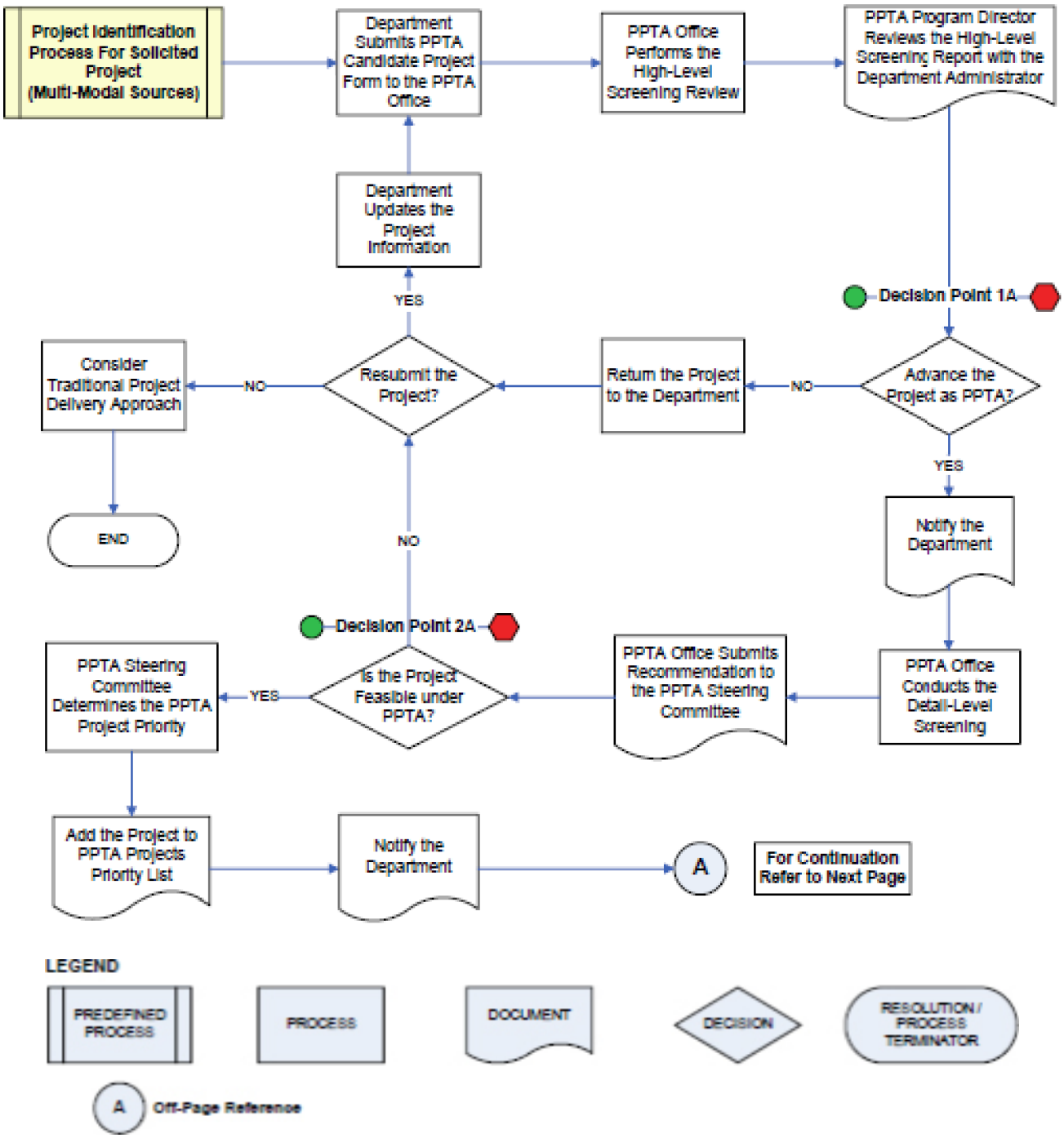
P3 Programs	When Are Projects Identified?	Who Identifies Them?	How Are They Screened/ Compiled?	How Are They Prioritized?	How Are They Selected for Procurement/Developed?	Guidance on NEPA	Procurement Planning/ Presolicitation	RFQ/RFP	Selection and Award Process Steps
ADOT P3 Program Guidelines (September 7, 2010)	Not really referenced. Reference to an "internal project selection process."	Solicited: ADOT. Unsolicited: private entities.	Office of P3 Initiatives has responsibility (reports to Executive Director for Planning and Policy, and in turn, to Arizona DOT director). Process for solicited proposals not explicitly discussed. Unsolicited proposers encouraged to request one-on-one meetings with the department to discuss "sufficient merit." Unsolicited: 3-step evaluation process: pass/fail (meet requirements?), initial evaluation (does it have value?), and detailed evaluation (may involve public input; technical, financial, legal examination); after, may initiate request for competing proposals.	Not specified.	Input from the P3 Advisory Committee, which serves at the pleasure of Arizona DOT director. P3 Technical Advisory Committee advises on technical issues of candidate projects and advises during solicitation process.	Not specified.	Use some or all of: RFI, RFQ, proposer review meetings, RFP—project-specific. One-step or two-step process. One option is a procurement delivery agreement (PDA) approach—proposal for services for a project in early stages (no firm technical scope, pricing, or financing; environmental approvals may not be in place); PDAs focus on conceptual plans. A lot of detail is given on the required content of the responses to these requests but not on the process of utilization, decision making, or timing.	If RFQ, a short-list is developed from statements of qualifications (SOQs).	Evaluation criteria and their weightings determined on a project-specific basis. Best value evaluation methodology expected in most cases—Office of P3 Initiatives will determine in advance an internal proposal evaluation plan. Best and final offer (BAFO) process may be used.
Georgia DOT PPP Guidelines (February 2, 2010)	Anytime during the planning process; no unsolicited proposals.	GDOT, also other state agencies, local governments, MPOs.	An initial project screening list is developed and reduced to a final project screening list by applying Screening Committee-developed criteria/methodology. Requested project data and a workshop facilitate the process and include project delivery method recommendations. A report is generated, and a list of candidate projects is ultimately approved by the state transportation board.	Included as part of the screening report and evaluation workshop results.	Not specified.	Not specified.	A Procurement Team develops a work plan, master schedule, and conducts a risk workshop. The work plan identifies technical, financial, legal, and public outreach tasks to be performed before solicitation. Presolicitation industry outreach can include an industry forum and one-on-one meetings. A public information and stakeholder outreach plan is prepared. A one-step (RFP) or two-step (RFQ/RFP) process is selected. Project delivery method is confirmed, and payment considerations made.	If RFQ: The procurement team develops an evaluation methodology and manual for the Selection Recommendation Committee (SRC) to review and rank SOQs. A recommended list of 2–5 proposers receives an RFP. Draft RFPs and one-on-one meetings optional.	The procurement team develops an evaluation methodology and manual for SRC to identify two or more proposers. Discussion and interviews held to select one or more to negotiate. BAFO solicited. Recommendation made to the board, which decides on the award.
Louisiana Transportation Authority PPP Guidelines (March 19, 2009)	Not specified.	Solicited: Authority identifies them and conducts economic feasibility studies to substantiate project need and feasibility. Must be part of approved transportation plan and Louisiana Department of Transportation and Development program. Unsolicited: private entities.	Authority considers a range of issues (e.g., demonstrated need, political support, funding, transfer of risks, expedited project delivery).	Not specified.	Not specified.	Unsolicited proposal to include preliminary list of local, state, and federal permits/approvals.	Two-step process used; RFI optional before RFQ/RFP. Joint proposer workshops or one-on-one meetings may be held before submission of proposals. If authority proceeds with procurement from an unsolicited proposal, public hearing held with information submitted to House and Senate Committees on Transportation. After this, a one- or two-step procurement process is initiated to solicit competitive proposals and qualifications.		Evaluations may include the invitation for observation of representatives from federal, state, or local agencies. May select proposer for comprehensive or predevelopment agreement with or without negotiations or select more than one for competitive negotiations. Best value used, other selection processes possible.

(continued on next page)

Table B.2. Overview of State P3 Programs in Arizona, Georgia, Louisiana, and Virginia (continued)

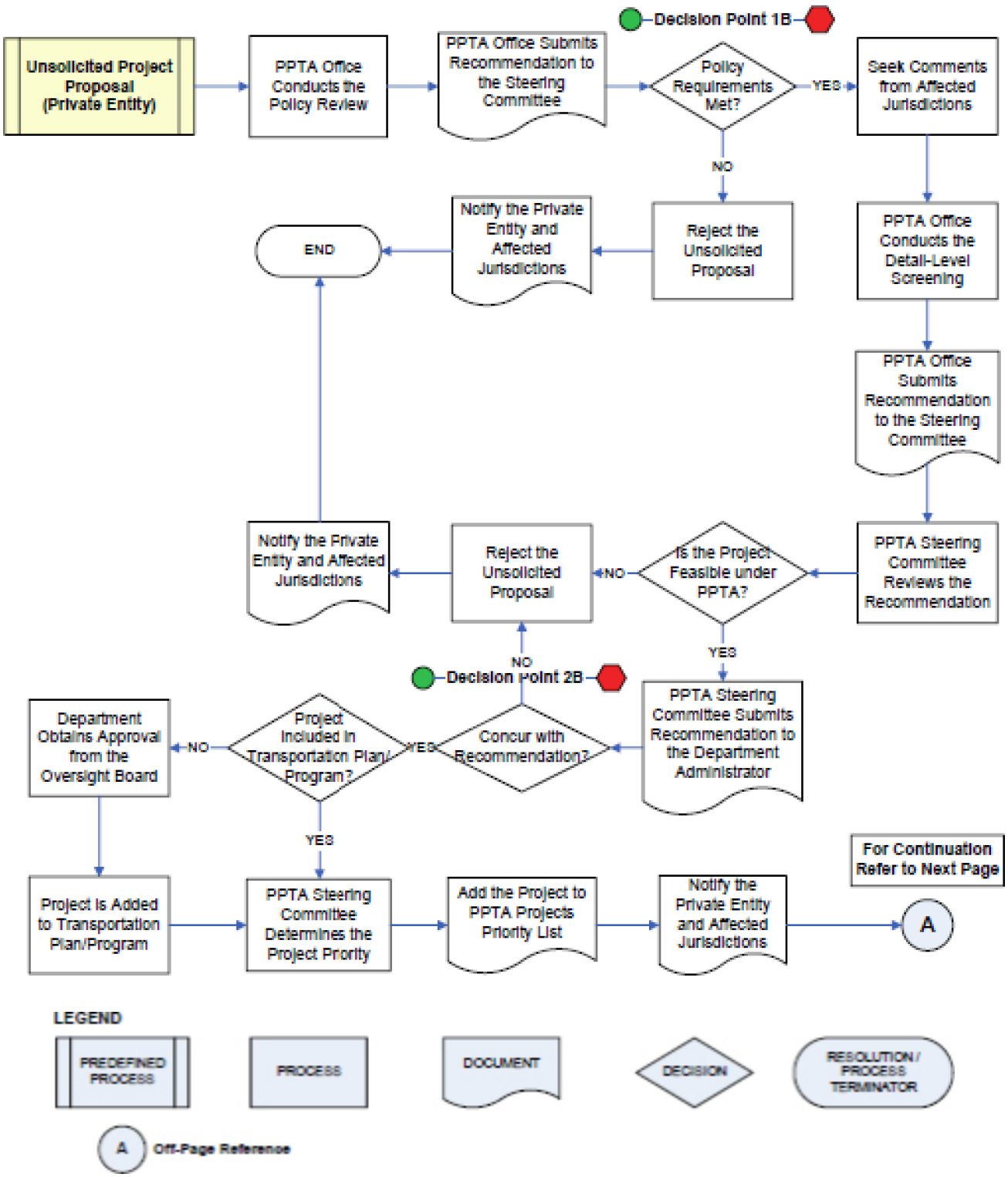
P3 Programs	When Are Projects Identified?	Who Identifies Them?	How Are They Screened/ Compiled?	How Are They Prioritized?	How Are They Selected for Procurement/Developed?	Guidance on NEPA	Procurement Planning/ Presolicitation	RFQ/RFP	Selection and Award Process Steps
Virginia PPTA Implementation Guidelines (October 31, 2005)	Project selected for solicited proposals—not specified. Unsolicited proposals anytime.	VDOT/Virginia Department of Rail and Public Transportation (DRPT)/Virginia Department of Aviation (VDOA)/Virginia Port Authority (VPA) may solicit proposals in general or for specific projects. Private entities (unsolicited—skip to selection process steps).	Not specified.	Not specified.	Not specified.	Not specified.	SFP (solicitation for proposal) (conceptual proposal). Asked to outline "the independent process(es) for environmental review and compliance," that is, they must specify how the project will satisfy NEPA and all applicable state and/or federal laws. Preproposal conferences optional. Unsolicited proposals (if accepted) will trigger notice that competing proposals will be solicited.	6 Phases, including 2 in adjacent column: 1. Quality control—does (conceptual) proposal meet requirements of law and guidelines. 2. Independent Review Panel evaluation and recommendation, includes public comments. 3. Oversight board concurrence/rejection and decision to seek detailed proposal. 4. Submission of detailed proposal via request for detailed proposals and final selection of detailed proposal (step can be skipped in certain cases).	5. Negotiation of interim and/or comprehensive agreement—determines maximum return on revenue, liability, end date. 6. Attorney General review/ approval, then final review by department administrator.
Virginia Public-Private Transportation Act (PPTA) Implementation Manual and Guidelines (December 8, 2010)	PPTA office maintains a portfolio and periodically performs a high-level screening. Solicited proposals from various sources: state planning documents, General Assembly legislation, STIP, LRTP. Unsolicited proposals anytime.	Solicited: planning staffs from all transportation agencies, offices, and MPOs—use a candidate project form for submission. Unsolicited: private entities. VDOT/DRPT/VDOA/VPA planning divisions and PPTA office manage the process.	All submissions (solicited and unsolicited) go to the PPTA Office. Phase 1 Solicited: high-level screening (twice per fiscal year as necessary); guidance provided in manual; recommendations made for detail-level screening. Unsolicited: policy review, evaluation of concepts and benefits; guidance provided in manual. Phase 2 Detail-level screening at least once every 2 years; produce project screening reports. PPTA Steering Committee reviews reports and approves/rejects projects. For Unsolicited: advance to competitive procurement; may have to add project to appropriate planning documents.	Steering Committee prioritizes into short-, medium-, and long-term (financial close in <2 years, 2–4 years, 4–6 years); prioritization criteria provided in manual. Includes projects from unsolicited proposals that meet approval and are added (if necessary) to department transportation plan/program; may require coordination with MPO to reflect project in LRTP/TIP.	Selected from prioritized list. Critical steps: NEPA, public involvement, procurement strategy assessment, and initial VfM.	Solicited: relevant department or agency responsible for completion of environmental document before inviting proposals (procurement). After this, PPTA Office makes a decision on advancing project as a P3.	Typically two-step (RFQ/RFP) but could be merged.	RFQ issued. PPTA office reviews, scores, and ranks SOQs received; approval from Steering Committee for short list for RFP. RFP issued. Option to issue as draft and hold one-on-one meetings to solicit feedback.	Before selection, final VfM analysis to compare department's public-sector comparator (PSC) and preferred proposer's proposal. Conditional award made based on PPTA office recommendation and Steering Committee decision. Audit conducted (traffic and revenue forecasts, public costs, and liabilities). Comprehensive agreement executed to reach commercial close.

Note: PPP = public–private partnership.
Source: Parsons Brinckerhoff.



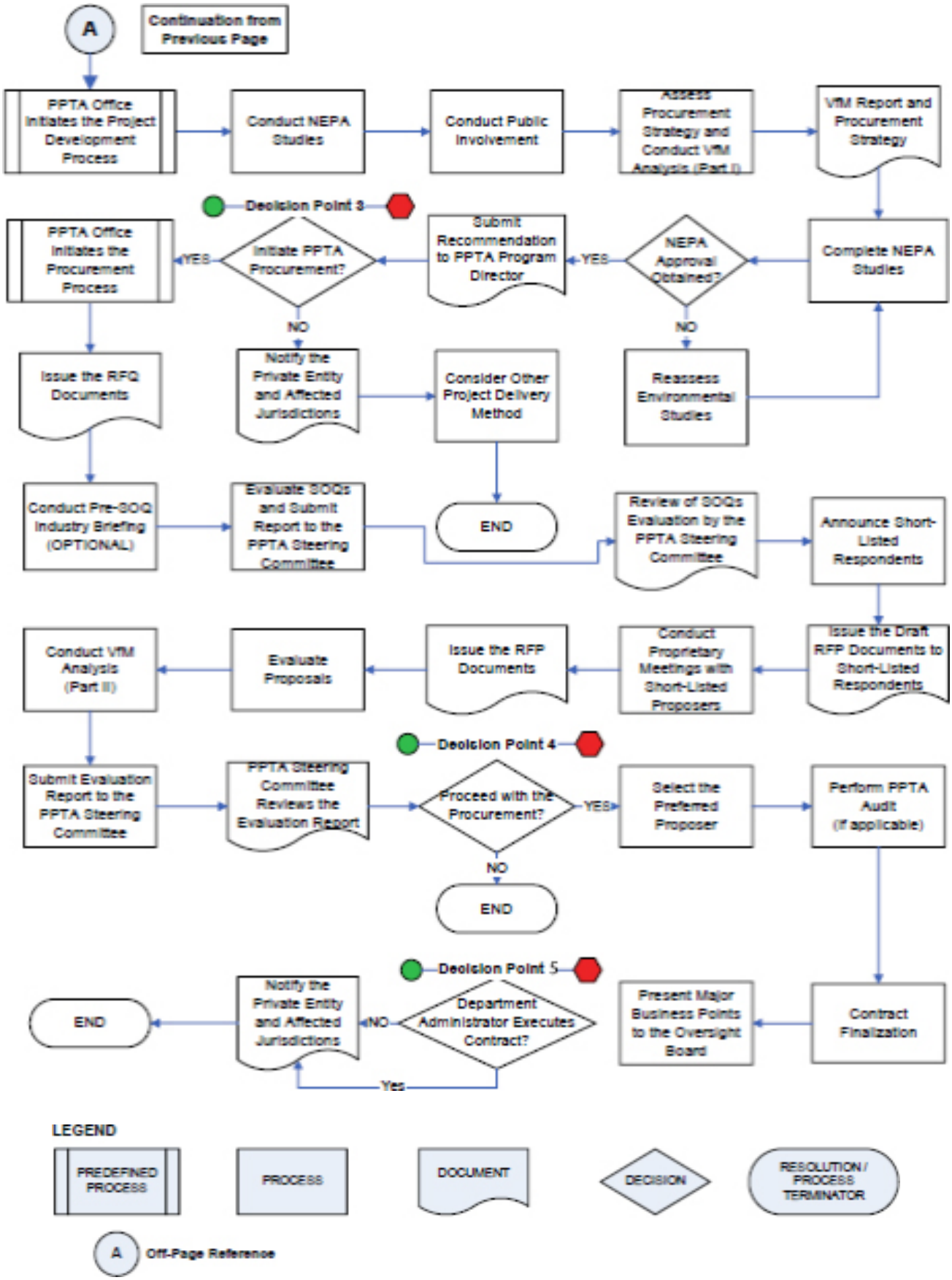
Source: VDOT.

Figure B.1a. Virginia PPTA Implementation Manual and Guidelines: Project Delivery Framework Flowchart (Solicited Projects).



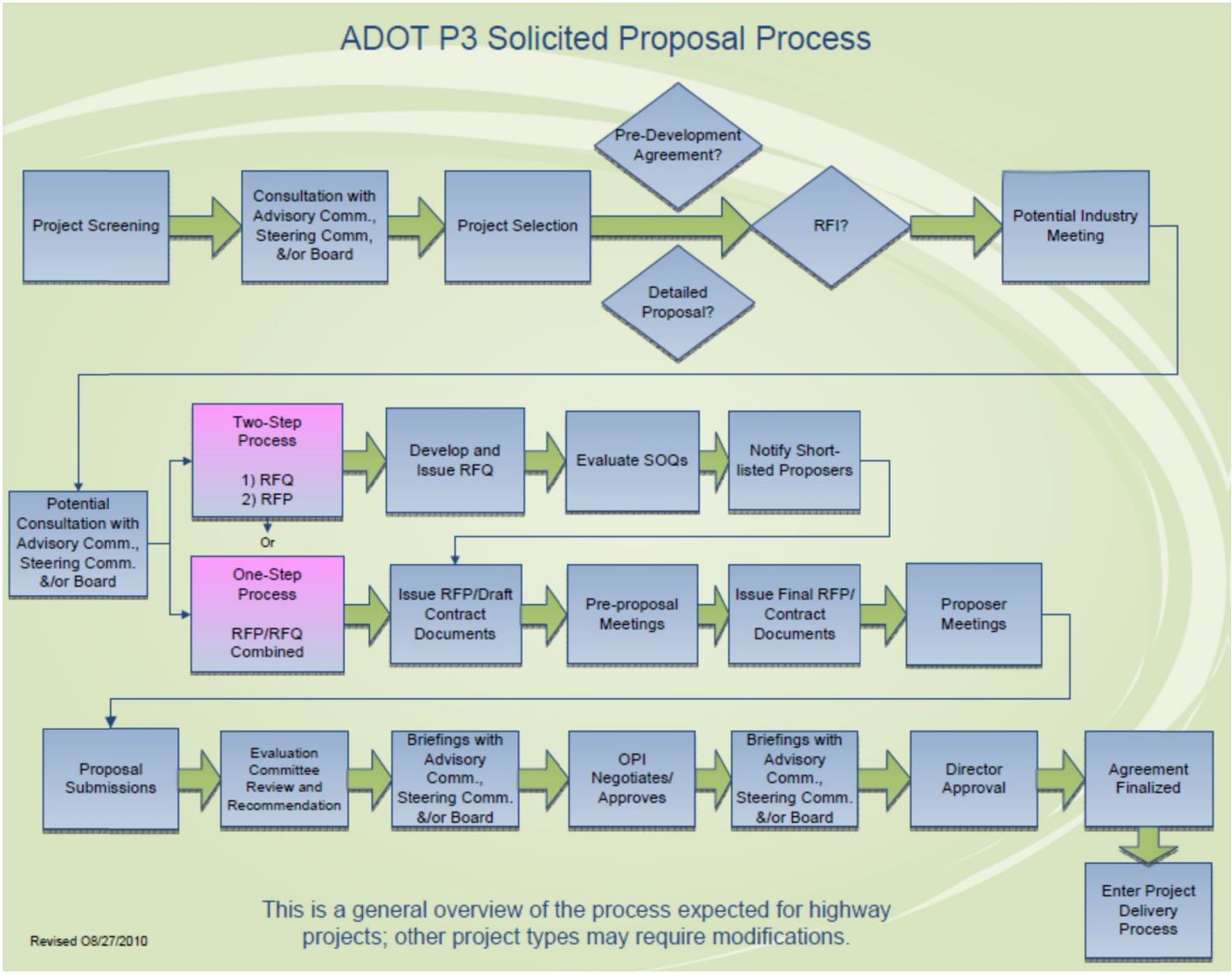
Source: VDOT.

Figure B.1b. Virginia PPTA Implementation Manual and Guidelines: Project Delivery Framework Flowchart (Unsolicited Projects).



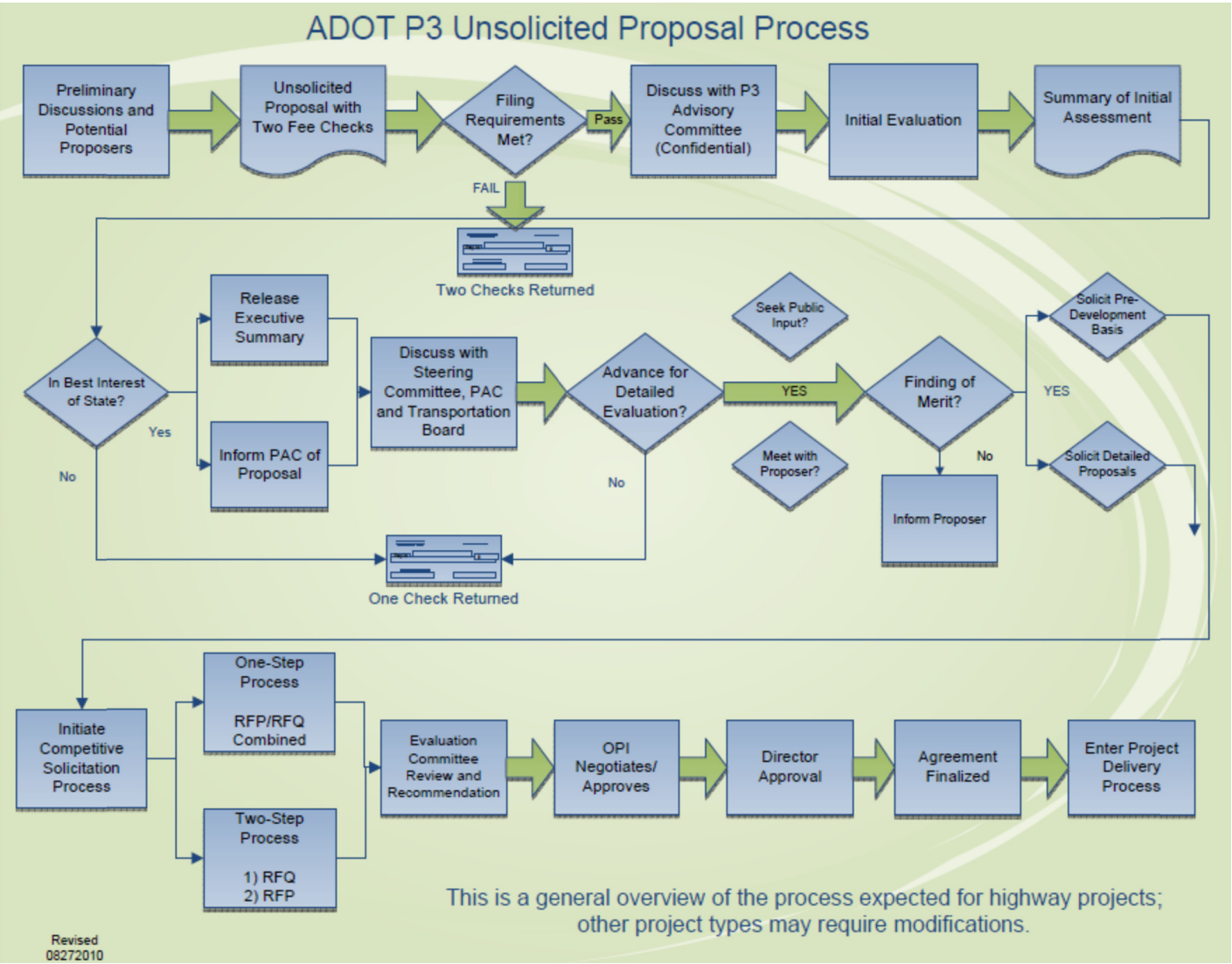
Source: VDOT.

Figure B.1c. Virginia PPTA Implementation Manual and Guidelines: Project Delivery Framework Flowchart (Solicited and Unsolicited Projects).



Source: ADOT.

Figure B.2. ADOT P3 Solicited Proposal Process Flowchart.

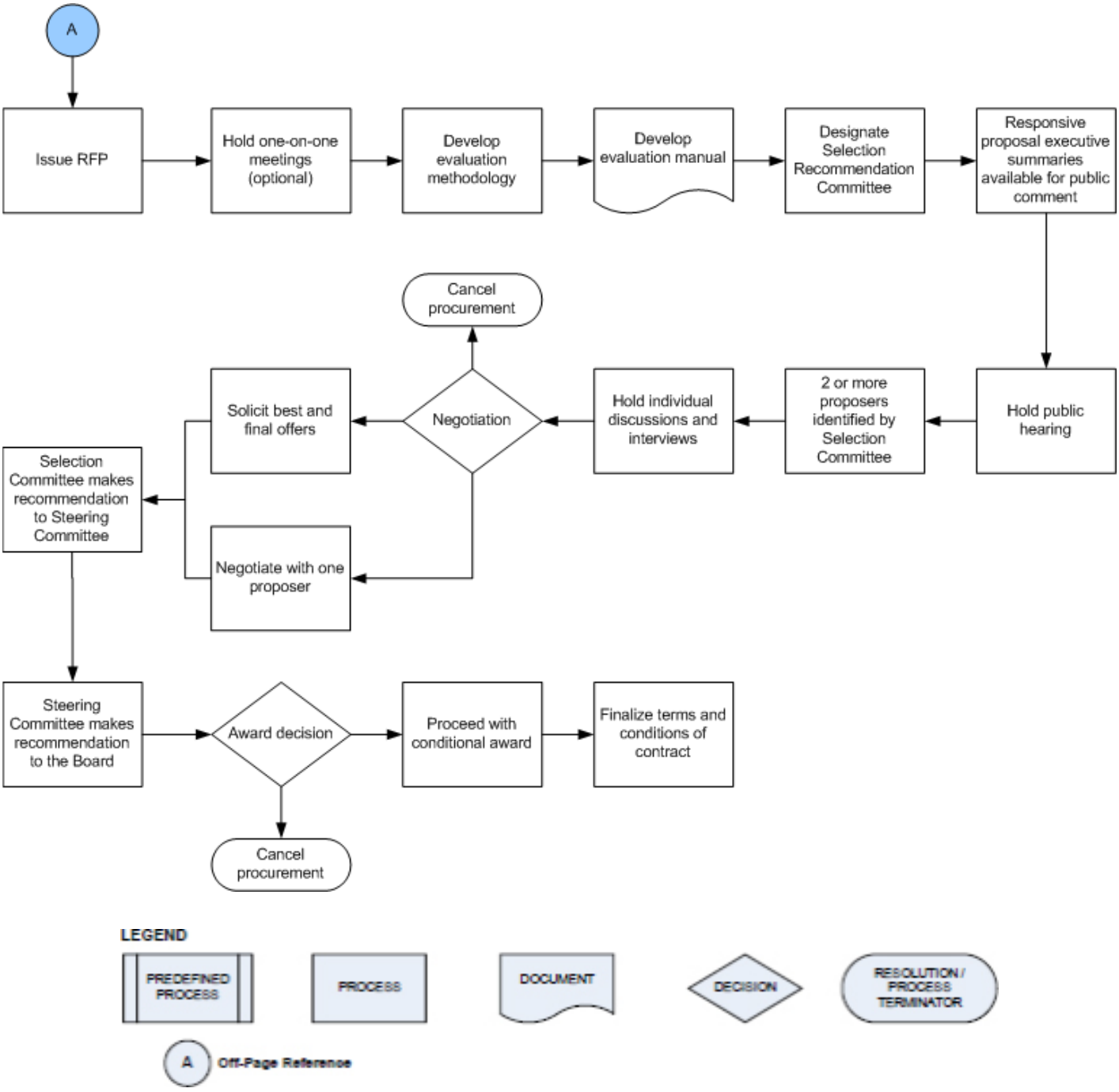


Source: ADOT.

Figure B.3. ADOT P3 Unsolicited Proposal Process Flowchart.

Source: Parsons Brinckerhoff.

Figure B.4a. GDOT Public–Private Partnership Guidelines Flowchart. (Continued on next page.)



Source: Parsons Brinckerhoff.

Figure B.4b. GDOT Public–Private Partnership Guidelines Flowchart. (Continued from previous page.)

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P3 Resources

The following is a list of useful P3 resources as they pertain to their general definition and application, to the transportation planning and environmental review processes, and to specific analyses conducted to gauge their value. The resources include research reports, general guidance and synthesis of best practice, and agency-specific publications on particular aspects of P3s or P3 programs. The set of resources includes those cited among the references used in the main research report for SHRP 2 Project C12 and in the literature review. The set also includes other resources that were consulted throughout the research and have been deemed helpful to practitioners and readers of the report.

General P3 Guidance and Synthesis of Best Practice

Buxbaum, J. N., and I. N. Ortiz. 2009. *NCHRP Synthesis of Highway Practice 391: Public Sector Decision Making for Public-Private Partnerships: A Synthesis of Highway Practice,* Transportation Research Board of the National Academies. http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_syn_391.pdf.

Federal Highway Administration, U.S. Department of Transportation. *User Guidebook on Implementing Public-Private Partnerships for Transportation Infrastructure Projects in the United States.* http://www.fhwa.dot.gov/ipd/pdfs/ppp_user_guidebook_final_7-7-07.pdf. Accessed July 7, 2007.

KCI Technologies, Inc. 2005. *Current Practices in Public-Private Partnerships for Highways.* July. http://transportationfortomorrow.com/final_report/pdf/volume_3/background_material/23_current_practices_in_public_private_partnerships.pdf.

Perez, B. G. 2004. *Achieving Public-Private Partnership in the Transport Sector,* iUniverse, Bloomington, Ind.

Rall, J. *Public-Private Partnerships for Transportation: A Toolkit for Legislators March 2012 Updates and Corrections,* National Conference of State Legislatures. http://www.ncsl.org/documents/transportation/PPPTOOLKIT-update-March2012.pdf.

Rall, J., J. B. Reed, and N. J. Farber. 2010. *Public-Private Partnerships for Transportation: A Toolkit for Legislators,* National Conference of State Legislatures. October. http://www.ncsl.org/documents/transportation/PPPTOOLKIT.pdf.

U.S. Department of Transportation. *Innovation Wave: An Update on the Burgeoning Private Sector Role in U.S. Highway and Transit Infrastructure.* http://www.fhwa.dot.gov/reports/pppwave/ppp_innovation_wave.pdf. Accessed July 18, 2008.

P3 Valuation Analysis

Morallos, D., A. A. Amekudzi, C. Ross, and M. D. Meyer. 2009. Value for Money Analysis in U.S. Transportation Public-Private Partnerships. In *Transportation Research Record: Journal of the Transportation Research Board, No. 2115,* Transportation Research Board of the National Academies, pp. 27–36.

Papernik, B. G., and D. J. Farkas. Using Alternative Technical Concepts to Improve Design-Build and PPP Procurements. Nossaman LLP E-Alerts. http://www.nossaman.com/using-alternative-technical-concepts-improve-designbuild-ppp. Accessed March 31, 2009.

Siemiatycki, M. 2010. Delivering Transportation Infrastructure Through Public-Private Partnerships: Planning Concerns. *Journal of the American Planning Association,* Vol. 76, No. 1, pp. 43–58.

Williamson, S., M. F. Lawrence, and J. Mueller. 2011. State-of-the-Art of Value for Money Analysis: Determining the Value of Public-Private Partnerships. Presented at 90th Annual Meeting of the Transportation Research Board, Washington, D.C.

State Guidance

California Department of Transportation. *Draft Public-Private Partnerships Program Guide.* http://www.dot.ca.gov/p3/documents/prog_guide_final_draft_for_posting.pdf. Accessed Dec. 30, 2011.

Commonwealth of Virginia. *Public-Private Transportation Act of 1995 (as Amended): Implementation Manual and Guidelines.* http://www.virginiadot.org/business/resources/PPTA/PPTA_Implementation_Manual_FINAL_December_10_2010.pdf. Accessed Dec. 8, 2010.

Commonwealth of Virginia. *Public-Private Transportation Act of 1995 (as Amended): Implementation Manual and Guidelines.* http://www.virginiadot.org/business/resources/PPTA_Guidelines_FINAL_Revised_081205.pdf. Accessed Oct. 31, 2005.

Georgia Department of Transportation. *Public-Private Partnership Guidelines.* http://www.dot.ga.gov/informationcenter/p3/Documents/P3Guidelines.pdf. Accessed Feb. 2, 2010.

Louisiana Transportation Authority. *Public-Private Partnership Guidelines.* http://www.dotd.la.gov/administration/lta/documents/Public-Private%20Partnership%20Guidelines.pdf. Accessed March 19, 2009.

Office of P3 Initiatives, Arizona Department of Transportation. *ADOT P3 Program Guidelines.* http://www.azdot.gov/highways/Projects/Public_Private_Partnerships/PDF/ADOT_P3_Guidelines.pdf. Accessed Aug. 30, 2011.

Office of Transportation Public-Private Partnerships, Virginia Department of Transportation. 2011. *PPTA Value for Money Guidance.* April. http://www.vappta.org/resources/VDOT%20VfM%20guidance%20document_final_20110404.pdf.

Office of Transportation Public-Private Partnerships, Virginia Department of Transportation. 2011. *PPTA Risk Analysis Guidance.* September. http://www.vappta.org/resources/PPTA%20Office%20Risk%20Guidance%20Document%20v2.1%2020110930.pdf.

Office of Transportation Public-Private Partnerships, Virginia Department of Transportation. 2012. *PPTA Project Identification and Screening Guide.* April. http://www.vappta.org/resources/PPTA_Project_Identification_and_Screening_Guide_April_2012%203.pdf.

NEPA Guidance

American Association of State Highway and Transportation Officials. 2008. *Using the SAFETEA-LU Environmental Review Process (23 U.S.C. 139),* AASHTO Practitioner's Handbook 09. January. http://environment.transportation.org/pdf/programs/practitioners_handbook09.pdf.

Center for Environmental Excellency by AASHTO. 2007. *Defining the Purpose and Need and Determining the Range of Alternatives for Transportation Projects,* AASHTO Practitioner's Handbook 07. August. http://environment.transportation.org/pdf/programs/PG07.pdf.

Center for Environmental Excellency by AASHTO. 2006. *Managing the NEPA Process for Toll Lanes and Toll Roads,* AASHTO Practitioner's Handbook 03. July. http://environment.transportation.org/pdf/programs/PG03.pdf.

Center for Environmental Excellency by AASHTO. NEPA Process Overview. http://environment.transportation.org/environmental_issues/nepa_process/. Accessed April 19, 2012.

Center for Environmental Excellency by AASHTO. NEPA Process Research, Documents & Reports. http://environment.transportation.org/environmental_issues/nepa_process/docs_reports.aspx.

Council on Environmental Quality. 1981. NEPA's Forty Most Asked Questions, Question 2A. March 16. http://ceq.hss.doe.gov/nepa/regs/40/40p3.htm.

Federal Highway Administration, U.S. Department of Transportation. Environmental Review Toolkit. http://environment.fhwa.dot.gov/index.asp.

Federal Highway Administration, U.S. Department of Transportation. Memorandum from D. J. Gribbin (Chief Counsel) to Peggy Catlin (Deputy Executive Director, Colorado Department of Transportation). http://www.environment.fhwa.dot.gov/guidebook/NEPA_tollroads.asp. Accessed Oct. 15, 2004.

Federal Highway Administration, Office of the Chief Counsel, U.S. Department of Transportation. Alternatives Analyses White Paper. http://www.fhwa.dot.gov/everydaycounts/pdfs/altsanalysespaperhccwhitepaperwebversion9_22_10.pdf. Accessed Sept. 22, 2010.

Federal Highway Administration, U.S. Department of Transportation. *SAFETEA-LU Environmental Review Process Final Guidance.* http://www.fhwa.dot.gov/hep/section6002/section6002.pdf. Accessed Nov. 15, 2006.

Transportation Planning Process

Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. Environment and Planning Linkage Processes Legal Guidance. Memorandum from D. J. Gribbin (Chief Counsel, FHWA) and Judith S. Kaleta (Acting Chief Counsel, FTA) to Cindy Burbank (Associate Administrator, Office of Planning Environment and Realty, FHWA) and David A. Vozzolo, Deputy Associate Administrator, Office of Planning and Environment, FTA. http://www.fhwa.dot.gov/hep/plannepalegal050222.htm. Accessed Feb. 22, 2005.

Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. 2007. *The Transportation Planning Process Key Issues: A Briefing Book for Transportation Decisionmakers, Officials, and Staff.* Publication No. FHWA-HEP-07-039. September. http://www.planning.dot.gov/documents/BriefingBook/bbook_07.pdf.

Federal Highway Administration, U.S. Department of Transportation. Financial Planning and Fiscal Constraint for Transportation Plans and Programs: Questions & Answers. http://www.fhwa.dot.gov/planning/fsclcntrntques.htm. Accessed April 15, 2009.

Federal Highway Administration, U.S. Department of Transportation. Innovative Financing/Public Private Partnerships. Memorandum from Gloria Shepard (FHWA) to Division Offices Planning Staffs. http://www.fhwa.dot.gov/planning/invtvfnc.htm. Accessed May 21, 2007.

Federal Highway Administration, U.S. Department of Transportation. Link the Transportation Planning and National Environmental Policy Act (NEPA) Processes. http://nepa.fhwa.dot.gov/ReNepa/ReNepa.nsf/All+Documents/9FD918150AC2449685256FB10050726C/$FILE/Planning-NEPA%20Guidance%20%20final%20%202-22-05.pdf. Accessed Feb. 22, 2005.

Federal Highway Administration, U.S. Department of Transportation. Supplement to January 28, 2008, Transportation Planning Requirements and Their Relationship to NEPA Process Completion. http://www.fhwa.dot.gov/planning/tprandnepasupplement.htm. Accessed Feb. 9, 2011.

Federal Highway Administration, U.S. Department of Transportation. Transportation Planning Requirements and their Relationship to NEPA Process Completion. http://www.fhwa.dot.gov/planning/tprandnepa.htm. Accessed Jan. 28, 2008.

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