

INTRODUCTION

BACKGROUND

For many years, outsourcing by state departments of transportation (DOTs) has been a subject of great interest in both the public and private sectors. In the public sector, it has offered a means of program and service delivery that complements that which is provided in-house. Outsourced services have developed into a substantial market share of private-sector business practice, with some companies providing a wide array of services and others offering specialty services to public agencies.

Two major factors appear to be driving the current trends to outsource. The first is the overall growth in state highway programs. The Transportation Equity Act for the 21st Century (TEA-21) was signed into law in 1998, providing states with an average funding increase of more than 44% in their federal programs. Ultimately, TEA-21 took the annual national appropriations level to \$30 billion, when just a few years before it was less than \$20 billion—reflecting an actual increase of more than 50% from previous funding levels. The second factor affecting outsourcing by state DOTs is the current status of their work forces. Results from a survey of state DOTs conducted last year showed that 80% have either the same or declining staffing levels (Warne 2001). Having more available money with the same or fewer people to deliver the program ultimately results in the need for state DOTs to rely on the private sector for delivering services to the public.

Outsourcing includes a variety of activities, which will be detailed in this report. These services range from litter removal and other mundane but necessary maintenance activities to the most sophisticated engineering and computer services. It goes beyond engineering services, even including the logical activities associated with technology implementation in an agency's information technology arena.

In 1997, the NCHRP published *NCHRP Synthesis 246: Outsourcing of State Highway Facilities and Services*. David Witheford, an experienced transportation professional with an extensive background in the subject of outsourcing services to the private sector, performed this work. This synthesis provides a comprehensive look at the status of outsourcing in the state DOTs, as it existed then. Many of Witheford's findings will be referenced in this report because of their relevance and value in examining trends and shifts in practice.

As mentioned previously, TEA-21 was a historic transportation bill that provided a significant boost to the capital program for each state. Other efforts within the states during the same time period have also added to the available funding. Examples of alternate funding sources include state initiatives such as the Utah Centennial Highway Fund, which created a \$2.8 billion pool of funds needed to build capacity-increasing projects throughout the state, and Florida, which recently launched an economic development program, infusing hundreds of millions of dollars into its highway program.

Other examples of funding mechanisms, over and above the levels provided by TEA-21, include two national programs. The Grant Anticipation Revenue Vehicle was established by Congress as a financing tool for states to bond against future federal revenues, which would then be used to pay certain debt-related expenses. This tool was used extensively in New Mexico to advance its NM-44 reconstruction program. The second program offered by Congress was based on the Transportation Infrastructure Finance and Innovation Act, in which DOTs were offered credit assistance through a variety of means that would allow them to advance major transportation projects. Both tools gave DOTs the ability to finance projects in advance of their scheduled construction dates. Ultimately, they become relevant to the discussion of outsourcing, because they have an impact on the overall size of a state's program.

Combined, the additional funds have led to two situations. First, the need to outsource engineering services increased as elected officials' expectations of delivery increased with the new money provided for state DOT projects. Officials were eager to show constituents that projects were being built with these new financing sources. Second (and perhaps more important to the discussion of outsourcing), state budgets for adding full-time employees to undertake administrative and maintenance activities did not simultaneously increase by the same 44%.

Furthermore, a misunderstanding can occur with newly completed transportation projects. Many elected officials and citizens believe that once a major project opens to traffic, there is no cost for use or maintenance of the facility until some future point in the aging process. However, such is not the case. Projects become maintenance issues as soon as they are completed, requiring expenditures by the state DOT from noncapital improvement funds. Landscaping

must be maintained, lighting bills paid, litter removed, painted delineation freshened, snow removed, and so forth. Such expenses begin to accrue immediately, and pavement maintenance begins within a few years. Thus, expenditures on the capital side of the highway funding ledger ultimately result in increased spending on the maintenance side.

Some outsourcing initiatives have their genesis from within the state DOTs, whereas others come from external sources. Limited resources in personnel, equipment, or money often generate internal initiatives. For example, a state may decide to outsource the landscaping operations along the highway shoulders. Such a decision could be made owing to the high cost of owning and maintaining the mowers. On the other hand, some states have gone through externally mandated outsourcing by direction from their executive or legislative branches or indirectly through personnel reduction. If a state DOT has a limited staff, it must turn to the private sector to accomplish its mission. The Florida DOT is an example of this phenomenon, because it experienced a 25% reduction in staff during a recent 3-year period. South Dakota and Iowa have also experienced similar reductions.

Regardless of the reason, the trend is toward ever-increasing levels of outsourcing. With so much interest in the status of outsourcing in the states, DOT leaders determined that an updated study, similar to that undertaken for *NCHRP Synthesis 246*, be completed.

PROJECT SCOPE AND OBJECTIVES

The purpose of this report is to quickly and effectively update *NCHRP Synthesis 246*. Additionally, it will provide state DOTs with the most up-to-date information available on outsourcing and use of the private sector. It is anticipated that this report will give the states valuable insights into current outsourcing practices and an understanding of national trends.

This report was designed to take advantage of the data from *NCHRP Synthesis 246* and coordinate that information with current findings. Ultimately, the result is a comprehensive review of the practice of outsourcing in state DOTs over two different periods.

NCHRP Synthesis 246 offered insights into the growing area of public-private partnerships. Examples of some activities within the states were cited. It was anticipated that the current study would reveal new and important information on this growing segment of the outsourcing market. However, in the 5 years since the publication of *NCHRP Synthesis 246*, the lines between traditional outsourcing and public-private partnerships have blurred to the point

that states are making less of a distinction between the two. Thus, in the state responses, there is no differentiation between either type of outsourcing.

STUDY PROCEDURES

Information for this project was partially acquired by means of a thorough review of the available literature on the subject of outsourcing. This review covered almost 15 years, but focused particularly on the last 5 years, the time period since the publication of *NCHRP Synthesis 246*. That report held a complete compendium of the available literature so that no attempt was made to recreate the review conducted by Witheford (1997). A summary of the literature reviewed for this updated report is found in chapter two.

To achieve project objectives, a survey was prepared and distributed to each state DOT. Care was taken in drafting this document so that the original data collected for the earlier synthesis would be valuable for comparing and reviewing any trends or anomalies that might surface. In addition, questions were added to this new survey to ascertain further nuances about outsourcing relative to policy issues, which may currently be influencing such state efforts.

The review provided in this report includes a number of issues related to the outsourcing process.

- Types of contractors used,
- Prequalification procedures,
- Contract management processes,
- Selection processes, and
- Payment methodologies.

In addition, the following was covered: how these processes have changed in the last 5 years, anticipated changes in the next 2 years, and factors that influence an agency to outsource a particular activity. Each of these will be presented later in this report and compared, where appropriate, to the data gathered in *NCHRP Synthesis 246*.

The volume of information sought from the states was substantial. In total, the survey document exceeded 50 pages. A specialized fill-in-the-blank and check-the-box format was used to speed the completion of the different survey elements. In addition, the survey was divided into distinct parts. The first part was intended to be completed by an individual with a broad public policy view of outsourcing. The second part comprised the seven activity groups of outsourcing as established in the previous report: Administration, Construction, Design, Maintenance, Operations, Planning, and Right-of-Way. Within these groups,

individual activities as noted in the earlier report were continued in this effort, for the purposes of uniformity and comparison. A copy of the survey questionnaire can be found in Appendix A. The Construction activity group did not include the capital program for each state, but rather consisted of construction management and inspection and testing activities.

The survey was sent to the TRB representatives in each of the 50 state DOTs and the District of Columbia. These individuals then distributed the activity group surveys to respective units within their agency. For example, the outsourcing items found under the Maintenance activity group were generally sent to the maintenance division within the agency. Hence, the work required by any single individual or division was not overwhelming.

SURVEY RESPONSE RATE

Most completed surveys were returned directly to the contractor, although some states compiled them and returned them as a group. In all, 38 states, the District of Columbia, and associate members responded to some portion of the survey. In some cases, states responded to the first part and all seven of the activity groups in the second part, whereas others completed and returned various categories from the activity groups.

Nearly 500 responses were received from the second part of the survey, concerning the seven activity groups. Information about categories received from specific states can be found in Appendix B. All groups had sufficient response rates to allow for analysis and conclusions.

It should be noted that virtually all states outsource some activities within their work programs. In some areas, such as Design, all DOTs outsource some amount of the work. However, in both quantity and approach, the process of outsourcing and the determination of what to outsource is clearly unique to each DOT.

SYNTHESIS ORGANIZATION

This synthesis report is organized to allow for valuable comparative analysis with *NCHRP Synthesis 246*. Some tables and data from the earlier synthesis are included as appropriate, and a set of four tables from that report are included for comparison purposes and can be found in Appendix C. The following is a brief summary of each chapter and its content.

- Chapter one includes a review of the purpose of this report and an overview of the outsourcing issue. It provides a foundation for the discussion presented in the remaining chapters. A short discussion of the study process is also included, and the relationship of this effort to *NCHRP Synthesis 246* is established.
- Chapter two presents a summary of the literature. The findings were reviewed for relevancy and content for this report.
- Chapter three captures the survey results as reported by the state DOTs. Comparisons with *NCHRP Synthesis 246* are presented as appropriate.
- Chapter four reviews the factors considered in the decision-making process that a state DOT goes through to establish an outsourcing program.
- Chapter five examines the process of procuring outsourced services and the various attributes of such efforts.
- Chapter six examines the measures that state DOTs use to determine the effectiveness and success of their outsourced programs.
- Chapter seven describes important trends and attributes among the most frequently outsourced activities within each of the activity groups.
- Chapter eight summarizes the findings.

Appendix A is the survey questionnaire, Appendix B lists the states responding to the survey and which parts of the survey the responses cover, Appendix C presents relevant tables from *NCHRP Synthesis 246* and other tables pertinent to the current study for the purposes of comparison, and Appendix D provides responses to selected survey questions.

LITERATURE REVIEW

The literature review conducted for this synthesis examined the array of papers, reports, audits, and other related documents on the subject of outsourcing. The work performed by Witheford in preparing *NCHRP Synthesis 246: Outsourcing of State Highway Facilities and Services* was extensive and the current project made no attempt to repeat that effort. Instead, the literature review focused on more recent documents.

The literature was found to contain much information and many analyses concerning state outsourcing practices. Although not every work reviewed will be noted or referenced here, major points and significant works will be cited. A complete listing of additional sources reviewed is contained in the bibliography at the end of this report.

Outsourcing studies and literature can be divided into a number of categories. Some consider the various activities being outsourced, and others review the practices and their effectiveness. Other works look at the policy issues associated with outsourcing. The most commonly covered area of this topic concerns the outsourcing of engineering services and its cost-effectiveness.

PUBLIC–PRIVATE PARTNERSHIPS

Public–private partnerships have been the subject of much of the literature in the years since the publication of *NCHRP Synthesis 246*. Many studies have focused on how current practices in outsourcing can be improved and how the relationships between public–private partners can be more profitable for both parties.

In a resource paper prepared for the TRB conference on Transportation Finance for the 21st Century, Stephen Lockwood (1997) defines public–private partnerships as “a change in roles and relationships based on a new mix of complementary public and private resources (expertise, technology, finance) pooled toward a common objective—while still achieving the partners’ respective separate objectives.” He then lists five “models” for these partnerships.

1. Traditional free roads with conventional funding and development encompassing traditional major road development;
2. Advanced free roads with innovative finance and turnkey project delivery as in large road reconstruction projects such as I-15 in Salt Lake City;

3. Innovative public toll roads like the Transportation Corridor Agency toll roads in Orange County, California;
4. Nonprofit community association developer toll roads as used in some public–private partnership projects in Arizona, Minnesota, South Carolina, Virginia, and Washington; and
5. Private/developer-sponsored toll roads as used for the Dulles Greenway in Virginia and SR-91 in Orange County, California.

Zhang and Kumaraswamy (2001) listed the necessary elements for successful public–private partnerships. A suitable legal foundation is necessary to make partnerships possible, but it cannot be overregulated. Also, a workable procurement process and a coordinating and supportive authority are needed to guarantee that both parties will meet financial goals and that funds will be available for future projects. The next two elements are marketability and affordability. They ensure that the private partners are able to take the risks involved in the partnership and that users, through tolls and tariffs, can afford to use the finished project.

Another important aspect of such partnerships is the selection of the most suitable concessionaire, through examination of the financial and technical proposals. Finally, Zhang and Kumaraswamy advocate adjustment of the public attitude: “The government’s perspective needs to shift from a regulatory stance and the somewhat judgmental role in traditional procurement routes to the proactive, more liberal, and dynamic outlook needed for public–private partnership scenarios.”

In a state-of-the-industry scan sponsored by AASHTO, researchers also looked at public–private partnerships. They noted that DOTs are using partnering in the following areas: environmental streamlining, road maintenance, intelligent transportation system (ITS) development, and planning. Specifically, the uses that DOTs find for public–private partnerships fall into the categories of project development, program delivery, planning or planning-related activities, and long-term relationship building. DOTs use these partnerships to solve problems, increase efficiency, and implement programs that cross agency or jurisdictional lines (Ford 2001).

According to Ashley et al. (1998), some of the pitfalls of public–private partnerships include unreliable traffic

predictions on toll roads and political uncertainty over time. The researchers concluded that projects were successful when partners could adapt to change in political and economic conditions. They advocated the use of a Project Scoring Table to outline the decisions that must be made among the partners, where each partner describes its interests in the following areas: political clearance, public-private structure, project scope, environmental clearance, construction risk, operational risk, financing package, economic viability, and developer financial involvement. Then the public and private partners can discuss the similarities and differences to better understand each other.

Giglio and Ankner (1998) listed the responsibilities of each party in the partnership. The public sector is responsible for the high-risk work of project development, environmental assessment, community outreach, and condemnation. The private sector is responsible for efficiency and quality. Both sectors share in profitability. The authors also listed roadblocks to working public-private partnerships; these include a lack of experience, institutional barriers, and legislative and political barriers.

According to Karen Hedlund in *Financing of Public-Private Partnerships* (2001), current tax law discourages public-private partnerships. Hedlund says, "private financing, construction, ownership and operation is subject to a significant cost penalty that discourages the utilization of private-sector efficiencies and risk taking in public projects, since private developers are extremely limited in their ability to tap the benefits and efficiencies of tax-exempt financing." Many states have proposed or completed public-private projects, including Arizona, California, Minnesota, New Jersey, Oregon, South Carolina, Texas, Virginia, and Washington. These types of projects are now common in some foreign countries, including Argentina, Australia, Brazil, Canada, Chile, China, France, Greece, Hungary, Indonesia, Israel, Italy, Portugal, South Africa, and Spain (Hedlund 2001).

OUTSOURCING

Studies of the outsourcing of engineering services, including analyzing the effectiveness of this practice, have been carried out since the early 1980s, and continue to be undertaken up to the present day. These studies were initiated by state DOTs, state legislatures, or by third parties, such as national or state industry associations. Some were probably "agenda driven," initiated to prove a certain predetermined result. However, it appears many were attempting an honest assessment of outsourcing engineering services in their particular locale. It is worth noting that the vast majority of the studies were directed to a specific state DOT rather than to the national view of outsourcing. Thus, variation in factors occurs from one state to another, for example, with

issues raised in a Montana study not necessarily relevant in New York.

The *NCHRP Synthesis 246* study (1997) found that one-third of the functions in a state DOT were outsourced, but that only 20% were totally outsourced. Reasons for outsourcing were most frequently related to either increased workloads or decreased staffing levels. For maintenance, reasons were frequently related to cost. The study also found that a majority of respondents expected levels of outsourcing to increase in the future. Much variation was found among states in areas such as outsourcing procedures, pre-award and prequalification processes, use of alternative bids, and value engineering. The most common benefits cited by respondents were the ability to supplement in-house staffing levels in meeting workloads and schedules, the ability to use specialized skills or equipment available in the private sector, and cost savings (Witthford 1997).

In a study produced by the National Association of State Highway and Transportation Unions, researchers explored the loss of technical expertise in state DOTs as a result of the contracting out of more work. The report also discusses the cost of outsourcing and the loss of accountability, because states are unable to apply quality control concerning consultants once the work has been contracted out (Kusnet 2002).

Randall Owen (2001) discusses the competition between a public-sector organization and a private-sector organization in a bid for vehicle maintenance in the city of Charlotte, North Carolina. The public-sector organization won the bid by incorporating private-sector practices into its organization. Owen advocates the use of competition to improve public-sector organization.

Transportation Research Board

For at least 15 years, the National Research Council, through TRB, has been involved in reviewing and analyzing the concept of outsourcing. Six studies sponsored by TRB were reviewed for this synthesis. The TRB studies focused on the policy issues pertaining to the use of private firms for preliminary engineering as opposed to the relative cost-effectiveness of this practice.

The first study in 1988 concluded, "The key to an adequate consultant management process is a capable agency staff. The importance of continual upgrading of in-house capability through internal and external training methods cannot be overemphasized" (Sternback 1988). More recently, a study done through NCHRP reviewed the topic of outsourcing with the goal of improving the management of state DOTs. The results revealed that the surveys and

internal study teams who have previously studied this question have come to conclusions based on personal judgment and insufficient data. The authors also noted that more study is really needed before drawing any major conclusions about outsourcing and its effectiveness (Hancher and Werkmeister 2001).

Legislative Audits

Another category of studies available on the subject of outsourcing engineering services pertains to those performed through a legislative audit format. These studies vary in their findings on the issues of cost-effectiveness, the quality of work performed by the private sector, and the relative success of outsourcing programs. Indeed, they seem almost equally balanced on either side of these issues.

An early legislative audit performed in Wisconsin found no cost difference between consultant-designed and in-house-designed projects. This same study also found the quality of work performed to be essentially the same (*An Evaluation . . .* 1990). A 1994 legislative audit performed on the Connecticut DOT concluded that outside consultants were more expensive than in-house personnel where projects had a construction value of less than \$5 million (*Analysis . . .* 1994). A legislative audit in Montana found that hourly costs for outsourced engineers were approximately 69% higher than for in-house employees, although the quality of consultant and in-house plans was comparable. Some outsourced projects were actually less expensive despite the Montana DOT's significant hourly rate advantage (Porter 1996). Finally, a study initiated by the Mississippi DOT (MDOT) in February 1998 noted, "Examining a set of comparative highway and bridge projects, we could find no substantial difference in the cost to MDOT in designing a project in-house versus by the private sector, either in actual total costs or in design costs as a percentage of construction costs" (Cameron and Donly 1998).

Many of the studies reviewed raise questions about the accuracy of the data used to perform the required analysis. For example, an audit report conducted on the North Carolina DOT (NCDOT) in 1992 concluded that, "We were unable to perform a comparison between the full cost of completing an engineering project in-house and contracting out a similar project because sufficient accounting data [are] not available" (Renfrow 1992). Additionally, according to this audit, "Interviews with Department personnel revealed that when the time budget for a project has been achieved, additional time on the project is usually charged to another project which has budget time remaining. This incorrect recording of project time distorts the information within the time management system and invalidates any analysis of the system's information" (Renfrow 1992). This situation is not unique to the NCDOT. A

legislative audit performed on the Texas DOT (TxDOT) outsourcing program concluded that the department's cost data had little value in evaluating the cost comparison between in-house and outsource engineering services (Alwin 1997). In addition, a 1997 audit in Wisconsin noted errors in coding hours worked on projects and found that some projects showed zero hours reported by state employees when they had actually worked on the project (*Management . . .* 1997). A comparative analysis by an internal DOT team in Missouri arrived at some project charges simply by polling district personnel for their opinion on the matter (*Design Cost . . .* 1992).

Outsourcing Costs

The studies reviewed for this synthesis include many attempts to ascertain the true value of the overhead burden borne by the state DOTs to make a fair and appropriate comparison of costs. There are differences of opinion about how to account for these costs. In addition, questions arise concerning utilization rates, how to account for non-project-related time for state employees in overhead, which management expenses can be distributed to projects by means of indirect overhead charges, proper accounting of insurance, utility and building expenses, and a variety of other factors. Ultimately, little agreement exists on these approaches, nor does any single approach surface as the defining model for this report.

Some of the research has examined management practices within state DOTs and has been critical of these activities. There were two audits performed on the Virginia DOT (VDOT). In the first audit performed in 1998 it was noted that, "Despite the fact that consultants are an increasingly significant mechanism through which VDOT accomplishes its work, the department does not adequately maintain and track meaningful consultant data to enable it to make sound decisions on consultant use" (*Review . . .* 1998). This report goes on to say that without such management systems in place, VDOT is in no position to determine the effectiveness of its outsourcing program. Another management issue was raised in other studies concerning the cost-estimating process for negotiating with selected consultants. An audit conducted in Delaware found that state employees were not using an independent written cost estimate before starting negotiations with a selected consultant (*Final Report* 1998). The same situation was noted in the 1997 Wisconsin audit, which found that state employees were not always following established procedures for estimating costs and negotiating contracts with consultants (*Management . . .* 1997).

This literature review has noted disparities between states concerning the actual cost of oversight for consultant engineering work. The Missouri study previously cited

polled state employees about the cost of oversight and other overhead charges related to preliminary engineering and concluded that in some cases it was approximately 30% (*Design Cost . . .* 1992). In North Carolina, NCDOT employees estimated their costs to supervise consultants to be approximately 5%, but the audit noted, “The time management system in place does not accurately capture employee time spent supervising consultant contracts. Therefore, we cannot accurately identify consultant supervision costs” (Renfrow 1992). Another study conducted in California concluded that California DOT employee charges accounted for 47.9% of all project costs for outsourced projects (Ashley et al. 1998).

For cost analysis of outsourcing versus in-house work, 80% of the studies done on the subject show that outsourcing of design work is more expensive than or as costly as in-house work. These studies varied as to the extent of the expense, claiming anywhere from 30% to 100%. Wilmot et al. (1999) did their cost comparison study for the Louisiana Department of Transportation and Development, adopting improved criteria, including using the same project to compare in-house and consultant design costs (instead of using similar projects). They performed a detailed analysis of overhead rates that are comparable between state and consultants, and measured comparative design costs as the ratio of in-house to consultant design costs, instead of the ratio of design to construction costs often used in past studies. Using these guidelines, the researchers found that the Louisiana Department of Transportation and Development had 20% higher costs for design work performed by consultants. The difference in cost was found to be mostly because of the increased cost of contract preparation and supervision of consultant designs.

Quality of Work

Questions have been raised over the years about the quality of the work performed by outsourced engineering services. The studies reviewed offer insight on this subject, including the early Wisconsin audit that reported, “We found no widespread evidence of poor consultant quality in contracted highway design projects” (*An Evaluation . . .* 1990). Additionally, the Montana audit performed in 1996 found that the quality of work performed by state personnel versus outside engineering firms was comparable (Porter 1996). In a 1987 study of outsourcing engineering by the TxDOT, the Center for Transportation Research concluded

there was no objective way to measure the quality of the work performed by consultants versus that of in-house-prepared plans (Ward 1987). Where an analysis was undertaken, the literature clearly indicates that consultant plans are at least equal to those produced in-house. Nowhere in the literature is there any indication of poor quality work on the part of private engineering firms performing work for state DOTs.

Level of Outsourcing

Some of the research reviewed focused on the level of outsourcing engineering services for state DOT projects. Some states outsource less than 10% of their program, whereas others outsource more than 75%. One report published in the *Professional Services Management Journal* attempted to determine an optimal level of outsourcing by comparing the cost of engineering with the total cost of construction for both in-house and outsourced projects. After reviewing 11 years of data from the FHWA, the authors concluded that states that contract out 50% to 70% of their engineering services have the lowest overall cost of engineering for their total program of projects. Those with less than 10% have the highest cost of engineering for their program (Fanning 1991).

The outsourcing of engineering services has been researched thoroughly over the years, and there has been much focus on the cost elements of this activity. However, two recent studies found that states primarily decide to outsource because of staffing constraints, increasing workloads, schedule considerations, or unique project requirements. It was noted that decisions to outsource are made with sensitivity to cost, but with recognition that there is probably no other way to deliver the projects (Witheyford 1997, 1999).

The available literature is skewed toward outsourcing engineering services, with most of the other areas of outsourcing virtually neglected. In addition, the engineering services area is mostly studied from the cost comparison viewpoint and not with a view towards examining the quality of work performed. *NCHRP Synthesis 246* and this report probably represent the most comprehensive works on the subject of outsourcing with a broad look at the policy issues, procurement methods, satisfaction levels, quality of work performed, and program approaches. Coupled with the existing literature, these two NCHRP reports provide valuable insights into the practices of outsourcing in the states.

CURRENT PRACTICES IN OUTSOURCING HIGHWAY ACTIVITIES

This synthesis report focuses on the current outsourcing practices of state DOTs. A comparative review of the current data with the data from *NCHRP Synthesis 246* was undertaken to determine if there were any significant trends. In each subsequent chapter where data are reviewed, the current data will be presented and then compared with the earlier work as appropriate.

The two-part survey was sent to all 50 states and the District of Columbia, and 38 transportation agencies responded. The first part of the survey was designed to sample policy issues relating to outsourcing in the states. This chapter will review the survey results of the second part of the survey, which covered the following seven activity groups of outsourcing:

- Administration,
- Construction,
- Design,
- Maintenance,
- Operations,
- Planning, and
- Right-of-Way.

The original Witheford document (1997) referenced Construction Management, which in the current activity group will be noted as Construction. The activities within this group have not changed, and there is no substantive difference in the data collection process. Within the activity groups, the survey queried the states on outsourcing efforts relating to 31 activities as identified in *NCHRP Synthesis 246*. Not all states engage in outsourcing in all the major categories, nor do they all outsource in each of the subcategories. A complete listing of the seven activity groups and their respective activities is presented in Appendix A.

The questions relating to the activity groups of the survey were directed at the actual practice of outsourcing specific activities within a state DOT. For each outsourced activity, such as traffic surveys (found in the Planning activity group), a series of questions was posed to assess the nature and effectiveness of that particular activity. The following information was requested in each activity:

- Nature of the activity outsourced,
- Year that outsourcing began,
- Percentage of this activity outsourced,
- Whether the amount of outsourcing has changed during the last 5 years,
- Whether the amount of outsourcing would change in the next 2 years,
- Annual dollar volume outsourced,
- Types of contractors used,
- Nature of pre-award procedures,
- Nature of the selection process,
- Method of payment,
- Factors influencing the decision to outsource,
- Advantages of outsourcing this activity,
- Disadvantages of outsourcing this activity, and
- Overall satisfaction with outsourcing.

By evaluating the responses to these questions, it is possible to assess the characteristics of each outsourced activity and the effectiveness of that effort.

INITIATION OF OUTSOURCING

The first question posed to the DOTs concerned the decade in which the outsourcing activity began. Table 1 shows the breakdown by decade and by activity group. It should be noted that the amounts included in the table represent all

TABLE 1
DECADE OUTSOURCING BEGAN

| Activity Group | 1950–59 | 1960–69 | 1970–79 | 1980–89 | 1990–99 | 2000–02 |
|------------------|---------|---------|---------|---------|---------|---------|
| Administration | 0 | 1 | 6 | 3 | 21 | 11 |
| Construction | 3 | 1 | 2 | 8 | 9 | 5 |
| Design | 4 | 6 | 16 | 21 | 14 | 8 |
| Maintenance | 16 | 9 | 24 | 23 | 33 | 2 |
| Operations | 13 | 5 | 6 | 13 | 27 | 7 |
| Planning | 4 | 7 | 9 | 22 | 31 | 5 |
| Right-of-way | 7 | 10 | 16 | 21 | 31 | 11 |
| Total Activities | 47 | 39 | 79 | 111 | 166 | 49 |

the responses for a given activity group but do not necessarily represent the number of states responding. For example, in the area of Administration, there are 21 responses shown for the 1990s. This number reflects that a total of 21 activities were reported to have started during that time. However, there were actually 16 states reporting these 21 activities. Of interest is the sharp increase in outsourcing activities in the 1990s. With 49 newly outsourced activities already reported for that decade, the state DOTs are moving toward an even higher level of outsourcing in the future. This appears to be a reflection of policy direction, which will be discussed later in this report.

Perhaps more important than when the activities began to be contracted out is the information on trends that was obtained by the next four questions posed in the survey.

Tables 2–5 provide an insight into how much contracting out is being done by activity, by percent and level, plus both a 5-year “look back” and a 2-year “look ahead” into the amount of outsourcing that will be done.

PERCENTAGE OF ACTIVITIES OUTSOURCED

Table 2 contains information relating to the proportion by which a particular activity is outsourced. For example, some states outsource a major portion of their ITS activity. Again, the numbers presented in the table are a reflection of the total number of activities reported and are not a total of the states responding on a particular activity. Thus, it is possible for one state to have more than one activity shown in a given table. For example, one state may outsource

TABLE 2
PERCENTAGE OF ACTIVITIES OUTSOURCED

| Activity Group | 0–19% | 20–39% | 40–59% | 60–79% | 80–99% | 100% |
|------------------|-------|--------|--------|--------|--------|------|
| Administration | 7 | 8 | 10 | 3 | 9 | 6 |
| Construction | 10 | 4 | 4 | 4 | 4 | 2 |
| Design | 19 | 18 | 15 | 11 | 8 | 3 |
| Maintenance | 29 | 14 | 15 | 15 | 25 | 11 |
| Operations | 14 | 5 | 6 | 7 | 22 | 23 |
| Planning | 7 | 6 | 12 | 8 | 27 | 12 |
| Right-of-Way | 23 | 25 | 11 | 8 | 21 | 9 |
| Total Activities | 109 | 80 | 73 | 56 | 116 | 66 |

TABLE 3
PERCENTAGE OF ACTIVITIES OUTSOURCED (1996 vs. 2002)

| | 0–19% | | 20–39% | | 40–59% | | 60–79% | | 80–99% | | 100% | |
|------------------|-------|------|--------|------|--------|------|--------|------|--------|------|------|------|
| | 1996 | 2002 | 1996 | 1996 | 1996 | 2002 | 1996 | 2002 | 1996 | 2002 | 1996 | 2002 |
| Administration | 4 | 7 | 6 | 8 | 7 | 10 | 1 | 3 | 4 | 9 | 1 | 6 |
| Construction | 14 | 10 | 3 | 4 | 3 | 4 | 3 | 4 | 1 | 4 | 0 | 2 |
| Design | 29 | 19 | 11 | 18 | 9 | 15 | 8 | 11 | 10 | 8 | 1 | 3 |
| Maintenance | 52 | 29 | 10 | 14 | 16 | 15 | 12 | 15 | 14 | 25 | 10 | 11 |
| Operations | 13 | 14 | 7 | 5 | 3 | 6 | 2 | 7 | 10 | 22 | 8 | 23 |
| Planning | 8 | 7 | 6 | 6 | 5 | 12 | 4 | 8 | 11 | 27 | 3 | 12 |
| Right-of-Way | 9 | 23 | 9 | 25 | 7 | 11 | 3 | 8 | 6 | 21 | 0 | 9 |
| Other | 6 | — | 4 | — | 0 | — | 2 | — | 6 | — | 15 | — |
| Total Activities | 135 | 109 | 56 | 80 | 50 | 73 | 35 | 56 | 62 | 116 | 38 | 66 |

TABLE 4
CHANGE IN LEVEL OF OUTSOURCING ACTIVITY OVER A 5-YEAR PERIOD,
1997–2001

| Activity Group | Increased | Decreased | Same |
|------------------|-----------|-----------|-----------|
| Administration | 23 | 8 | 15 |
| Construction | 19 | 1 | 8 |
| Design | 55 | 2 | 16 |
| Maintenance | 45 | 7 | 57 |
| Operations | 30 | 1 | 42 |
| Planning | 39 | 4 | 39 |
| Right-of-Way | 62 | 1 | 32 |
| Total Activities | 273 (54%) | 24 (5%) | 209 (41%) |

TABLE 5
PREDICTED CHANGE IN LEVEL OF OUTSOURCING ACTIVITIES,
2002–2004

| Activity Group | Increased | Decreased | Same |
|------------------|-----------|-----------|-----------|
| Administration | 7 | 10 | 27 |
| Construction | 13 | 4 | 11 |
| Design | 18 | 16 | 34 |
| Maintenance | 32 | 6 | 71 |
| Operations | 15 | 4 | 50 |
| Planning | 24 | 7 | 51 |
| Right-of-Way | 39 | 10 | 46 |
| Total Activities | 148 (30%) | 57 (11%) | 290 (59%) |

training and database management and may do so at two different levels. That situation would be shown in Table 2 as two different entries under the Administration activity group in the appropriate columns.

Some trends worth noting emerge from the data in this table. Only 66 of the 495 activities reported were 100% outsourced; representing 13% of the activities in which the states have decided to completely outsource the activity. Of these 66 activities, more than one-third were in the Operations activity group, and 6 of those were in the area of ITS. The following two conclusions may be drawn: (1) The states seem reluctant to give away all of an activity, with the exception of a trend in the ITS arena; and (2) If the activity requires expertise not likely to become common within the agency, then the decision may be to outsource the activity completely. On the other hand, if the state plans to develop the expertise in-house, then it would be less likely to outsource 100% of the work. It also should be noted that ITS represents a specialty skill set that might be difficult to establish within the state employment system of a DOT.

In examining data from *NCHRP Synthesis 246* and comparing it with the information gathered for this report, two findings become clear. Table 3 shows the relative percent values outsourced in each activity group for each of the studies. In both cases, the two most predominant categories are the 0% to 19% and 80% to 99% ranges. Additionally, the values in the other columns appear to stay relatively constant other than the increase already noted in the 100% column in this study. Comparison of the values for both studies across the entire table shows that there is clearly an upward trend in the amount of outsourcing being performed. That trend also reflects the policy shifts occurring in the various states.

CHANGES IN OUTSOURCING PRACTICES

One of the objectives of this study was to examine outsourcing practices in the states and to determine patterns or trends that might indicate the future of these activities. Two new questions were added to the survey to obtain such

information. The first one attempted to take a look back toward the time when *NCHRP Synthesis 246* was completed, to identify what has happened since then. The second question attempted to have the states predict, 2 years into the future, what will be happening in outsourcing in their state.

Table 4 shows the 5-year look back at state outsourcing activities. The data in this table show outsourcing in the states as having increased over the last 5 years. Indeed, only a scant 5% of the activities saw a decrease during this 5-year period. Meanwhile, 54% of the activities increased their level of outsourcing. By examining the number of activities that increased versus those that stayed the same, it may be noted that Design is the activity with the highest percentage increase in the last 5 years, whereas it also has the greatest difference between the “increasing” and “staying the same” categories. This result is probably a reflection of the increasing workload, which occurred in the outsourcing of design services due to the passage of the TEA-21.

Table 5 shows the predictions of survey respondents concerning the future of outsourcing in their states from 2002 to 2004. Some interesting facts emerge from these data and from comparing them with that found in Table 4. First, although the predicted number of those increasing activities clearly leads those that are declining, approximately 11% of the respondents did foresee a general decline in outsourcing. There was no clear trend in the survey data; rather, the decline was in isolated cases from different states. Examples of where there was a predicted decline included relocation, acquisitions, location, and traffic studies. In total, outsourcing in 59% of the activities will stay the same, whereas 30% will increase. The Administration activity group is the only one where an overall decline is anticipated in the next two years.

A comparative review of both tables indicates that there is an upward trend toward an increase in outsourcing, but that the trend was much steeper for the last 5 years than predicted for the next 2 years. Some activities, which were increasing in the past, are now declining or staying the same. Others currently staying the same will be declining in the future.

TABLE 6
ANNUAL EXPENDITURES (\$) FOR OUTSOURCED ACTIVITIES

| Activity Group | 0–99,000 | 100,000– 499,000 | 500,000– 999,000 | 1,000,000– 1,999,000 | 2,000,000– 4,999,000 | 5,000,000– 9,999,000 | 10,000,000+ |
|------------------|----------|---------------------|---------------------|-------------------------|-------------------------|-------------------------|-------------|
| Administration | 12 | 23 | 1 | 1 | 2 | 1 | 2 |
| Construction | 4 | 9 | 2 | 2 | 3 | 3 | 3 |
| Design | 3 | 10 | 1 | 6 | 16 | 10 | 25 |
| Maintenance | 16 | 15 | 13 | 16 | 17 | 13 | 18 |
| Operations | 2 | 11 | 13 | 15 | 11 | 12 | 11 |
| Planning | 15 | 26 | 10 | 14 | 10 | 2 | 1 |
| Right-of-Way | 16 | 39 | 8 | 12 | 8 | 4 | 0 |
| Total Activities | 68 (14%) | 133 (27%) | 48 (10%) | 66 (14%) | 67 (14%) | 45 (9%) | 60 (12%) |

Notes: All values are in 2002 dollars.

ANNUAL VOLUME OF OUTSOURCING

The annual volume of contracted-out activities was also measured in the survey. Table 6 reflects the values based on the activities reported and the dollar amounts outsourced on an annual basis. Right-of-Way has the most activities outsourced in the \$100,000 to \$499,000 range, followed by Planning and Administration. Not surprisingly, the numbers in Administration decline considerably after the \$499,000 level. In the upper ranges, there is a clear distinction between Design, Maintenance, and Operations for all three activity groups starting at \$2 million and moving higher. Some of the DOTs with activities rising above the \$10 million threshold are Maryland and West Virginia with their construction inspection programs, Washington State with its design efforts, and Florida with its materials testing activity.

Table C2 in Appendix C is from *NCHRP Synthesis 246* and can be compared with Table 6 to contrast the changes from 1996 through 2002. Caution should be exercised in this comparison, because the levels of funding from both reports were surveyed as ranges. Thus, direct comparison of the data from both tables should be done with the recognition that no adjustment for inflation, or its impact on the range boundaries, or other factors is possible given the manner in which the data are reported.

However, some comparison of the results from the current study with those of the earlier synthesis yields observations that are significant. In the \$10 million and above category, three activity groups had no reported activities: Administration, Planning, and Right-of-Way. In the current report, all activities except Right-of-Way show activity at the \$10 million and above level. In addition, Design has eclipsed Maintenance as the category with the highest volume of activity since the original study. Operations, hardly a strong area in the earlier report, is currently a much more significant player in the outsourcing world, owing largely to the amount of work outsourced in the ITS arena.

PREQUALIFICATION

In Table 7, the states' information reflects their patterns in whether or not they prequalify contractors. Here there is a

clear trend towards prequalification overall, but in some of the activity groups there is a fairly even split. For example, in Administration, the activities are almost equally divided, whereas in Right-of-Way, the majority of the providers of outsourced services are prequalified.

TABLE 7
PREQUALIFICATION OF CONTRACTORS

| Activity Group | Prequalified? | |
|------------------|---------------|-----------|
| | Yes | No |
| Administration | 23 | 20 |
| Construction | 11 | 11 |
| Design | 44 | 20 |
| Maintenance | 51 | 53 |
| Operations | 60 | 13 |
| Planning | 48 | 27 |
| Right-of-Way | 72 | 18 |
| Total Activities | 309 (66%) | 162 (34%) |

TABLE 8
HOW OUTSOURCED CONTRACTS ARE MANAGED

| Activity Group | Central | Functional | Both |
|------------------|------------|------------|-----------|
| | Management | Unit | |
| Administration | 11 | 5 | 24 |
| Construction | 10 | 3 | 13 |
| Design | 27 | 27 | 14 |
| Maintenance | 58 | 27 | 22 |
| Operations | 42 | 13 | 17 |
| Planning | 27 | 27 | 21 |
| Right-of-Way | 19 | 56 | 22 |
| Total Activities | 194 (40%) | 158 (33%) | 133 (27%) |

CONTRACT MANAGEMENT

Management of outsourced contracts was another area sampled in the survey of the DOTs. The question was intended to determine which part of the state organization managed the contract and administered the provider. The data contained in Table 8 show results for all seven activity groups. In this case, the results are split between the three options with no single management location overwhelmingly predominant. The method selected for contract administration in the states depends on several factors, including the type of contract, organizational structure of the DOT (e.g., centralized or decentralized), and size of contract. No management method is used exclusively by a state for all of its outsourced activities.

DECIDING TO OUTSOURCE

One of the major issues facing state DOTs is deciding when to outsource. Some activities are presented as a clear business case, such as highway construction projects, whereas others are less obvious, such as training activities. Ultimately, the decision to outsource becomes one unique to each state and its policies and circumstances.

Questions in both parts of the survey addressed the reasons behind the outsourcing decision in the states. The first part concentrated on specific policy issues and included a wider view of the outsourcing process in a given DOT. The second part concentrated on the reasons for outsourcing a particular activity.

DECISIONS BASED ON POLICY

The first two questions on the survey were intended to determine if actual policy issues drove the decision to outsource or whether other considerations resulted in a particular activity's being turned over to the private sector. In most cases, DOTs responded that no policy decisions influenced a widespread use of outsourcing.

South Carolina responded that it had specific legislation requiring the state to do more maintenance work through outsourcing processes. All other narrative responses from the states reflected no overt policy leading to a significant effort to outsource major portions of a state DOTs workload. Although the Florida DOT did not respond to this part of the survey directly, it is widely known that the department is undergoing significant outsourcing as a consequence of policy direction from its executive branch.

DECISIONS BASED ON OTHER FACTORS

Narrative responses to the first part of the survey netted additional information relating to the outsourcing decision. This information demonstrates that, in the absence of policy direction, other factors exert an influence.

The Connecticut DOT reported that its decision to contract out work was based on the following factors:

- Available staffing,
- Construction cost threshold—more than \$5 million favors contracting out,
- Complexity of the work/time line, and

- Specialized expertise.

Employees from Illinois indicated that they contract out most of their engineering services. This decision was driven by the lack of available resources, a need for outside expertise or equipment, and the need to meet specific time frames or achieve economic advantages.

In Tennessee, a lack of in-house staff, a lack of in-house expertise, and cost and time frames for accomplishing a project were all forces leading the DOT to outsource, even though it had no specific policy mandating that. Iowa identified in-house expertise and in-house workload as two factors in its decision.

The narrative in the survey was designed as a snapshot of the policy view toward outsourcing. A review of these responses makes it clear that several factors are consistently mentioned. The major factors influencing states to outsource activities traditionally done in-house are

- Lack of resources,
- Lack of specific skills or expertise,
- Meeting a schedule, and
- Saving money.

DECISIONS BASED ON A SPECIFIC ACTIVITY

The second part of the survey was designed to highlight information about specific outsourced activities to determine trends and characteristics. This section differs from the previous discussion of survey results, which focused on outsourcing from a policy viewpoint. Each of the 31 activities called for a response to a question about factors that led to the outsourcing of that particular activity. However, both parts of the survey were relevant to the topic of influences, because they help to reveal whether high-level or agencywide issues are involved or whether the factors that led to outsourcing were more activity specific.

Table 9 contains results for the activities queried. For some activities there were multiple responses, and for others there was no response at all. The reader should understand these data limitations and that there is not necessarily a one-to-one correlation between activities and the factors reported.

Some interesting observations can be made as the data are reviewed. First, although there seemed to be little

TABLE 9
FACTORS INFLUENCING THE DECISION TO OUTSOURCE (2002 vs. 1996)

| Activity Group | Factors | | | | | |
|--------------------|-------------------|------------------|-------------------|------------------|-------------------------------|-------|
| | Legal Requirement | Policy Direction | Staff Constraints | Cost Comparisons | Specialty Skills or Equipment | Other |
| Administration | 7 | 10 | 32 | 6 | 28 | 0 |
| Construction | 1 | 6 | 24 | 1 | 12 | 1 |
| Design | 6 | 9 | 63 | 1 | 35 | 3 |
| Maintenance | 15 | 37 | 70 | 21 | 67 | 4 |
| Operations | 10 | 20 | 52 | 11 | 41 | 1 |
| Planning | 3 | 23 | 65 | 3 | 54 | 4 |
| Right-of-Way | 13 | 29 | 83 | 9 | 30 | 3 |
| Total Activities | 55 | 134 | 389 | 52 | 267 | 16 |
| % Reported in 2002 | 6 | 15 | 42 | 6 | 29 | 2 |
| % Reported in 1996 | 4 | 22 | 41 | 8 | 24 | 1 |

evidence of specific policy directives to outsource, for 15% of the activities, respondents felt that policy directives were involved. Alternatively, these data may be interpreted to mean that although agencywide directives were not involved, at a certain level in the agency, policies impacted specific activities.

Three areas were clearly less influential in making the decision to outsource these activities: legal requirements (6%), cost comparisons (6%), and other (2%). Even if their total of 14% were combined with the 15% for policy direction, the result would not represent even one-third of the activities surveyed.

The two most common factors influencing the decision to outsource were staff constraints (42%) and specialty skills (29%), which combine for a total of 71%. This outcome is not surprising when compared with information gathered in the narrative responses from the first part of the survey.

Some variations occur among specific activity groups. In all responses, staff constraints was the reason most frequently given for outsourcing. The percentage of activities within each of the activity groups that were influenced toward outsourcing by staff constraints ranged from a low of 31% for Maintenance to a high of 54% for Design. The second most frequently mentioned influence on outsourcing was specialty skills or equipment.

The subject of much of the literature reviewed for this report concerned state agencies' attempts to perform cost comparisons of in-house engineering work versus that performed through outsourcing methods. Great effort was made in these studies to review overhead rates, in-house and private labor rates, labor utilization rates, and other factors, to determine the cost-effectiveness of outsourcing.

Despite of these substantial studies to prove or disprove the cost-effectiveness of outsourcing engineering services, states are not making outsourcing decisions in Design based on cost. The data show cost comparisons ranking

just above other as the reason for outsourcing in activities reported. This dichotomy between the focus of the literature on cost and the actual reported frequency in the survey data is noteworthy. Most of the literature and studies are generated by outside organizations having a singular viewpoint of the decision to outsource: cost. On the other hand, the states must deal with an array of complexities including staff constraints, schedules, skill requirements, and workload in making their decision. Such responses from the states are an excellent reflection of the multidimensional nature of the decision to outsource.

TRENDS IN OUTSOURCING DECISION MAKING

In the original surveys for *NCHRP Synthesis 246*, DOTs were asked to identify factors influencing their decision to outsource. "Workload, described in various terms such as staff constraints or scheduling, appeared most often" (Witthford 1997). A second most-often-mentioned factor in making the decision to outsource was the need for specialized skills. The factor of cost-effectiveness appeared in 14 of the 81 responses, or 17% of the time. Next came considerations such as quality, the need for a third party, or political pressure.

In comparing results from the earlier synthesis to those from this study, some similarities as well as some differences can be observed. The earlier survey results are presented in Table C4. Staff constraints and specialty skills remained the most often cited reasons for outsourcing, with a combined percentage of nearly 64%. Nevertheless, the consistency with which both these factors are mentioned as leading the decision-making process is significant. In the Witthford study, policy direction was reported in 22% of the cases for outsourced activities, whereas data acquired for the current report revealed a value of 15%.

Also noteworthy is that cost-effectiveness ranked third in the earlier study, but now ranks fifth. In addition, although originally 8% of the DOTs cited cost-effectiveness as a reason for outsourcing, this number has now shrunk to

6%. The downward trend is significant for two reasons: first, because of the amount of the decline—a loss of two-thirds—and second, because this change occurred in such a short period of time between 1996 and 2002. The factor of cost-effectiveness is declining in importance to the DOTs in their basic decision to outsource selected activities.

The data from this survey reflect a strong tendency by DOTs to outsource as a result of staffing constraints. What is not clear from the survey responses is the cause and effect relationship between increased outsourcing and state staffing levels. Although it was not specifically sampled in the survey, that lack of adequate staff appears to be the

precipitating situation causing more outsourcing, as opposed to outsourcing's resulting in the need for less staff. The overall impact on staffing, new skill sets, management practices, and other ripple effects of outsourcing was not investigated as part of this synthesis report.

The discussion about why states outsource has been going on for many years. Studies have examined and will continue to examine the issue of cost-effectiveness. Nevertheless, to fully understand why a state chooses to outsource certain activities more than it does others, research must look beyond cost and review some of the other factors discussed in this report.