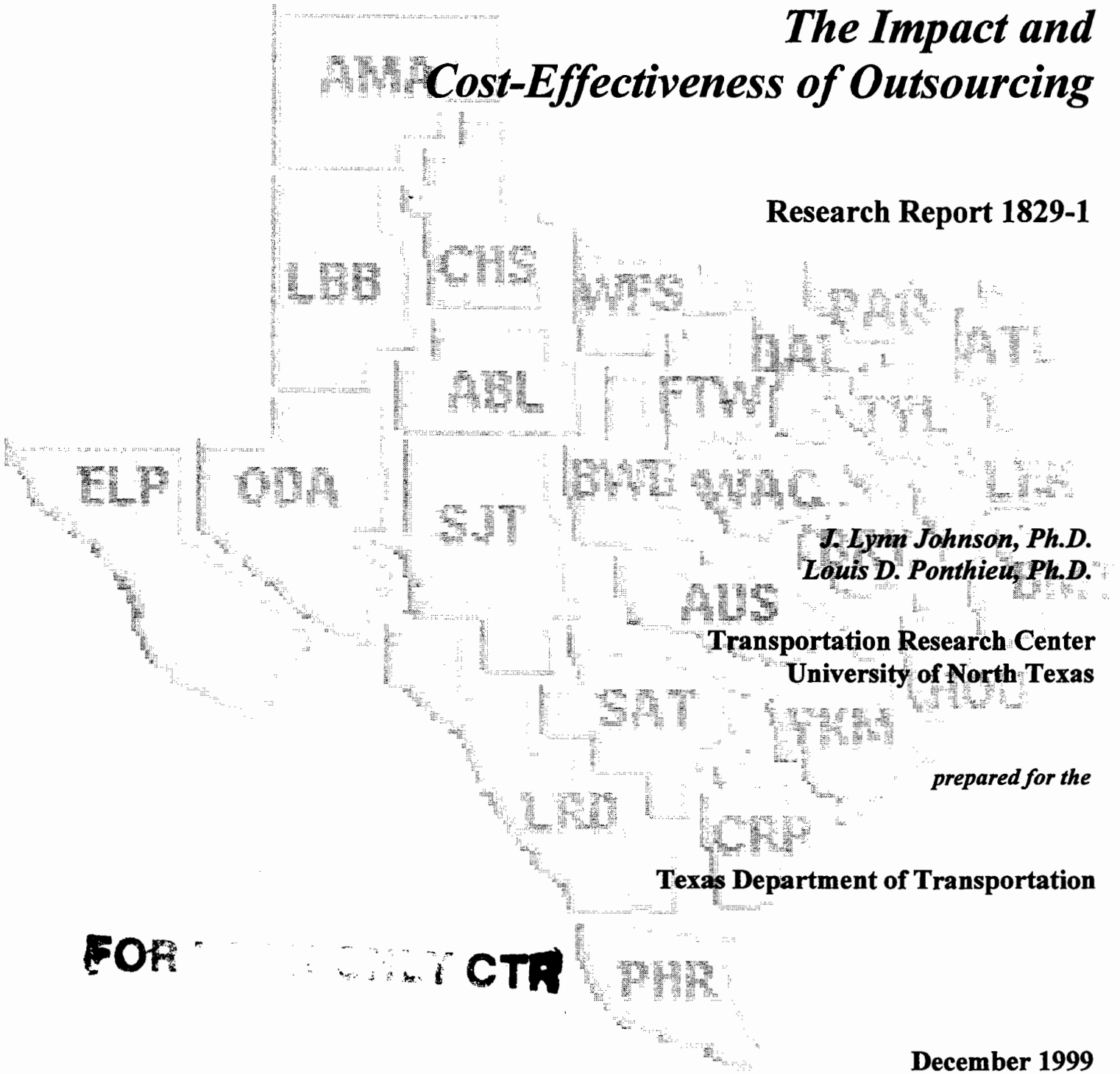
The Impact and Cost-Effectiveness of Outsourcing

Research Report 1829-1



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16. Abstract: This study was concerned with determining and evaluating the long-term impact and cost-effectiveness of outsourcing certain TxDOT functions. A 30-item Functional Outsourcing Assessment Instrument incorporating the evaluation factors was developed and utilized in this research. Nine surveys (1 for each of the nine functions under study) were sent to each of the 25 district offices of TxDOT. In addition, one survey for each function was sent to the appropriate central office for completion. An economic and vendor analysis was also completed for each district and for the state as a whole, and a nine-state survey was completed to benchmark practices by other states relative to the functions selected for study. Completed surveys on each of the nine functions were received from all 25 districts and one completed survey for each appropriate survey from the applicable central office of TxDOT. The findings of the study suggest that TxDOT should: (1) increase outsourcing of the Base-in-Place Repair and Paint-and-Bead Striping functions, (2) selectively outsource certain subfunctions of the Information Systems/Resources; Facilities Management and Maintenance; and Training, Quality and Development functions, (3) increase outsourcing, under effective contract management procedures, of the Right-of-Way Acquisition, Recruiting, and Partnering/Quality Facilitation functions, and (4) continue to insource the Benefits Processing function.

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Report 1829-1

TxDOT Research Project 0-1829 "Evaluate the Long-Term Impact and Cost-Effectiveness of Outsourcing"

The Impact and Cost-Effectiveness of Outsourcing

by

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Texas Department of Transportation (TxDOT)

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Denton, Texas

December 1999

IMPLEMENTATION STATEMENT

The recommendations presented in this report should be implemented, particularly those dealing with implementation of a continuing system of outsourcing evaluation and decision making utilizing the Functional Sourcing Decision Support Model (FSDSM) suggested by this research. Training of personnel involved in contracting activities should also be implemented.

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This report reflects the views of the authors who are responsible for the accuracy of the data presented. The contents do not necessarily reflect the official view of the Texas Department of Transportation. This report does not constitute a standard, specification, or regulation.

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There was no invention or discovery conceived or first actually reduced to practice in the course of or under this contract, including any art, method, process, machine, manufacture, design or composition of matter, or any new useful improvement thereof, or any variety of plant which is or may be patentable under the patent laws of the United States of America or any foreign country.

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ACKNOWLEDGMENTS

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CREDITS FOR SPONSOR

Prepared in cooperation with the Texas Department of Transportation and the Federal Highway Administration.

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LIST OF ACRONYMS AND ABBREVIATIONS

BIPR	Base-in-Place Repair
BP	Benefits Processing
CO	Central Office
DSS	Decision Support System
FMM	Facilities Management and Maintenance
FSDI	Functional Sourcing Decision Index
FSDSM	Functional Sourcing Decision Support Model
GLM	General Linear Model
HRD	Human Resources Division
HSD	Honestly Significant Difference
ISD	Information Systems/Resources Division
ISR	Information Systems/Resources
MD	Maintenance Division
PBS	Paint-and-Bead Striping
PQF	Partnering/Quality Facilitation.
R	Recruiting
ROWA	Right-of-Way Acquisition
ROWD	Right-of-Way Division
TQD	Training, Quality and Development

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SECTION 1.0

EXECUTIVE SUMMARY OF FINDINGS AND RECOMMENDATIONS

1.1 Objectives of the Study

This study was concerned with determining and evaluating the long-term impact and cost-effectiveness of outsourcing certain TxDOT functions. More specifically, the objectives of this research were:

- to identify and evaluate TxDOT functions as they relate to outsourcing and to make specific recommendations as to which functions should be outsourced and which should be accomplished in-house;
- to provide TxDOT management with the specific information necessary to make informed and efficient decisions concerning outsourcing in each geographical and economic area of the state;
- to provide TxDOT administration with the information necessary to inform the Texas Legislature and the Governor's Office of statute changes required to make TxDOT more efficient in its approach to outsourcing; and
- to provide a model, decision tree or flow chart that would assist TxDOT managers in their outsourcing decision-making processes.

1.2 Research Methods

Nine independent TxDOT functions were selected for intensive study. These were:

1. Base-in-Place Repair
2. Paint-and-Bead Striping
3. Information Systems/Resources
4. Right-of-Way Acquisition
5. Facilities Management and Maintenance
6. Training, Quality and Development
7. Recruiting
8. Benefits Processing
9. Partnering/Quality Facilitation

The primary and secondary sources of information utilized in this research were:

- an outsourcing survey of each of the 25 TxDOT district offices,
- central (division) office outsourcing surveys relative to the functions under study,
- benchmark information from other states concerning their outsourcing practices,

- actual and/or potential vendors (suppliers) of these functions, and
- benchmark practices suggested by the outsourcing literature.

The nine functions were independently evaluated on a common set of six factors. These factors were:

- External Mandates and Influences
- Strategic and Organization Effectiveness
- Organization Systems and Operations
- Cost and Cost-Efficiency
- Human Resources and Organization Culture
- Vendor-Related Factors.

A pretested 30-item Functional Outsourcing Assessment Instrument incorporating the evaluation factors was developed and utilized in this research. Nine surveys (one for each of the nine functions under study) were sent to each of the 25 district offices of TxDOT. In addition, one survey for each function was sent to the appropriate central office for completion. To round out the assessment of the actual and potential for outsourcing by TxDOT survey respondents, an economic and vendor analysis was also completed for each district and for the state as a whole, and a nine-state survey was completed to benchmark practices by other states relative to the functions selected for study.

Completed surveys on each of the nine functions were received from all 25 districts and one completed survey for each appropriate survey from the applicable central office of TxDOT. A response rate of 100 percent was therefore achieved in this study. Data were analyzed using the General Linear Model Univariate (GLM) procedure. Tukey's Honestly Significant Difference (HSD) test was used for multiple comparisons.

1.3 Findings

1.3.1 Specific Findings Relative to the Functions Studied

Table 1.1 presents a summary of the findings of this study regarding the long-term impact, cost-effectiveness, and potential of outsourcing the TxDOT functions selected for study in this research. The independent judgements contained in Table 1.1 represent a synthesis of both quantitative and qualitative data gathered from the district office outsourcing surveys, the central offices of the functions studied, benchmark information from other states concerning their outsourcing practices, information from actual and/or potential vendors (suppliers) of the products or services relative to these functions, and general benchmark practices suggested by the outsourcing literature.

- The long-term impact of outsourcing the nine functions studied was generally positive. Two functions were assessed as having a positive long-term impact; one positive to marginal; three marginal to positive; one marginal; one marginal to negative; and one clearly negative.

Table 1.1 - Summary of 0-1829 Research Findings Regarding the Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the TxDOT Functions Selected for Study in this Research

CO = central office DO = division office

Research Findings	Base-in-Place Repair (BIPR)	Paint-and-Bead Striping (PBS)	Information Systems/Resources (IS/R)	Facilities Management Maintenance (FMM)	Right-of-Way Acquisition (ROWA)	Training, Quality & Development (TQD)	Recruiting	Benefits Processing (BP)	Partnering/ Quality Facilitation (P/QF)
Long-Term Impact	Positive	Positive	Marginal to negative	Positive to marginal	Marginal	Marginal to positive	Marginal to positive	Negative	Districts positive; CO very negative
Long-Term Effectiveness	Positive	Positive	Negative to marginal	Districts marginal; CO negative	Marginal	Marginal; CO negative	Marginal	Negative	Marginal; CO negative
Outsourcing Potential at this time	High	High	Low to marginal selective high	Marginal selective high	Marginal	Marginal selective high	Marginal selective medium	Low	Marginal selective high
Benchmarks (other states)	Favorable (more than other states)	Favorable (more than other states)	Marginal (about the same as other states)	Marginal (about the same as other states)	Unfavorable (less than other states)	Unfavorable (less than other states)	Unfavorable (less than other states)	Favorable (more than other states)	Unfavorable (less than other states)
Incentive to Outsource	Mandates	Mandates	Expertise, technical skills	Vendor quality/ availability, cost	Workload, expertise	Vendor quality, availability, cost	Need, occupational level/skill required	None observed	Need. External influences.
Direct Cost-Effectiveness	Negative	Negative	Negative selective positive	Negative selective positive	Negative selective positive	Negative selective positive	Neutral to negative	Very negative	Neutral to negative
Systems/ Operations Effects	Positive	Positive	Negative	Positive to neutral	Neutral	Urban and rural districts neutral to positive; central office and metro districts negative	Neutral to positive	Neutral to negative	Positive
Organizational Effectiveness Effects	Positive	Positive	Negative	Positive	Neutral to negative	Rural districts positive; other regions negative	Neutral to positive	Negative	Neutral to positive
Human Resources & Culture Effects	Positive	Positive	Positive	Positive	Neutral to positive	Positive in urban and rural districts; neutral to negative in metro districts and central office	Neutral to positive	Negative	Districts neutral to positive; central office negative
Vendor-related Effects	Favorable	Favorable	Unfavorable to neutral	Favorable; varies by district & division	Neutral to unfavorable	Neutral to unfavorable	Favorable	Neutral to unfavorable	Very favorable
District - Division Agreement	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No
Recommendation	Increase Emphasis	Increase Emphasis	Selective outsourcing of needed skills.	Selective outsourcing of sub-functions	Increase outsourcing under effective contract management	Selective outsourcing of some sub-functions	Increase outsourcing under effective contract management	Continue to insure at this time	Increase outsourcing under effective contract management

- The long-term effectiveness of outsourcing the nine functions studied was assessed as marginal. Two functions were assessed as clearly having a positive long-term effectiveness; two marginal; four marginal to negative; and one clearly negative.

- The outsourcing potential of the nine functions studied was generally marginal to selectively positive. Two functions were assessed as having high potential for outsourcing. Six functions were assessed as having marginal to selectively positive potential for outsourcing. One function was assessed as having a very low potential for outsourcing.

- TxDOT compared favorably with other states in outsourcing the functions studied. TxDOT outsource three of the functions more than did the other states surveyed; in two functions about the same as other states; and less than other states in four of the functions studied.

- The incentive to outsource the functions studied varied. In two cases, outsourcing was clearly motivated by external influences and mandates, while need, vendor quality, availability, and cost were incentives in six functions. No incentive was observed in one of the functions studied.

- Outsourcing was assessed as generally more expensive, or accomplished at a higher cost, in all of the functions studied. Selective positive cost-effectiveness was reported in four of the functions studied.

- The systems/operations effects of outsourcing the functions studied was generally found to be neutral to positive with seven functions being neutral to positive and two functions neutral to clearly negative. This finding essentially suggests that outsourcing does not generally affect systems and operations.

- Actual and potential outsourcing did not generally affect organizational effectiveness relative to the functions studied. Outsourcing resulted in a perceived negative impact on organizational effectiveness in only two of the functions studied.

- Actual or potential outsourcing did not generally affect human resources or organization culture relative to the functions studied. Outsourcing resulted in a perceived negative impact on human resources and organization culture in only one of the functions studied.

- Vendor-related factors (e.g. availability, cost and quality), were generally found to be favorable to outsourcing the functions studied. Outsourcing of five functions were assessed as favorable, or positive, relative to vendor-related factors, while four of the functions studied were assessed as having negative, or unfavorable, vendor-related effects.

- The districts and the relevant central offices generally agreed on the long-term impact and cost-effectiveness of outsourcing the functions studied. There was significant disagreement between districts and central offices in only three of the functions studied. These differences

may be attributed to differences in perspective, information, resources, special situations, and/or local conditions.

1.3.2 General Findings Having Implications for Outsourcing These and Other TxDOT Functions

The general findings of this study having implications for outsourcing these and other TxDOT functions may be summarized as follows:

- Determining the extent to which a function should be outsourced is a complex undertaking and must involve the use of multidimensional factors and evaluation criteria, rather than reliance on direct costing alone.

- Partial outsourcing can be a viable alternative to either 100% outsourcing or 100% in-house performance of functions. The tendency to polarize sourcing on an all or nothing at all basis inhibits effective outsource decision making.

- The direct cost savings associated with outsourcing the functions studied have generally been small. Meager direct cost savings in the short run may also be expected in outsourcing other TxDOT functions. When indirect transaction costs are considered, significant cost savings are likely in noncore competency areas over time.

- Core competencies of an organization are typically few in number. It is arguable whether any of the functions studied in this research represent a core competency of TxDOT. The tendency to view all functions as core competencies tends to inhibit effective outsource decision making.

- Costs typically increase after an initial outsourcing period. That is, vendors generally tend to raise their prices once they have an organization locked into an outsourcing arrangement.

- There is no evidence to suggest that there are necessary quality or other differences between work performed in-house and outsourced work. Differences vary by function, vendors, and the effectiveness of contract management by the outsourcing organization.

- Evidence suggests that outsourcing organizations become more satisfied with outsourcing after a three-to-five-year period. This trend may be due to organization re-engineering to effect outsourcing, or to more effective contract management over time.

- Functions do not tend to be brought back in-house once they have been outsourced. Outsourcing increased, rather than declined, over time relative to the functions studied.

- Effective contract management is a necessary ingredient in successful outsourcing. Likewise, effective partnering with suppliers can make the difference in outsourcing success.

- Traditional direct costing tends to be an ineffective indicator determining the extent to which a function should be outsourced. Outsource decision making is more effective when a constellation of relevant factors are considered.

- A true cost-benefit analysis of functions is difficult when deciding to outsource a function or perform it in-house. True cost-benefit analysis involves a consideration of transaction costs; that is all actual and potential, internal and external, direct and indirect, tangible and intangible, discretionary and nondiscretionary costs associated with an outsourcing/in-house transaction.

- Outsourcing can negatively impact an organization's in-house capability to deliver. In the event that the outsourced function is not a core competency of the organization, such impact may be problematic.

- Outsourcing is justified when the function in question is not a core competency of the organization and when the overall impact of outsourcing on the organization is positive.

- Pilot studies are valuable adjuncts to the outsourcing decision making process. Such studies may indicate the extent to which a function should be outsourced over time.

1.4 Recommendations

1.4.1 Recommendations Regarding Outsourcing of the Functions Studied

Based on the findings of this study, TxDOT should:

1. increase outsourcing of the Base-in-Place Repair and Paint-and-Bead Striping functions,

2. selectively outsource certain sub-functions of the Information Systems/Resources; Facilities Management and Maintenance; and Training, Quality and Development functions,

3. increase outsourcing, under effective contract management procedures, of the Right-of-Way Acquisition, Recruiting, and Partnering/Quality Facilitation functions, and

4. continue to insure the Benefits Processing function.

1.4.2 Recommendations Regarding Outsourcing of Other TxDOT Functions

Based on the findings of this study, TxDOT should:

5. broaden the criteria by which outsourcing decisions are evaluated. Although cost savings is an important factor in a decision to outsource, reliance on direct cost alone may understate the potential and value of outsourcing since traditional direct cost does not include the cost

and benefit of transactions. Transaction cost as a criteria for evaluation would typically include "all cost" such as actual and potential, internal and external, direct and indirect, tangible and intangible, discretionary and nondiscretionary costs associated with outsourcing/in-house transactions. Such imputed costs may make more functions economically outsourceable;

6. use the Functional Sourcing Decision Support Model (FSDSM) proposed by this research to account for and weigh all of the factors important in making an outsourcing decision;

7. engage itself in effective contract management training. Included here would be a predetermination of effective contract management skills;

8. continue to benchmark itself against the DOTs in other states, and with trends and outsourcing approaches utilized by private industry;

9. increase emphasis on the value and necessity of effective partnering with suppliers;

10. promote and emphasize a broader approach in dealing with the Legislature. More detailed analysis will need to be presented in any attempt to defend in-house performance versus outsourcing of proposed functions; and

11. determine which TxDOT functions represent core competencies and which are noncore. In the longer run, core competencies should be retained and performed in-house; the remainder should be outsourced to some extent.

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SECTION 2.0

BACKGROUND AND INTRODUCTION

2.1 Need and Justification for the Study

TxDOT has historically entered contractual agreements with private sector vendors to supply products or services that the department could not efficiently or effectively perform in-house. Construction, for example, is, and has always been, accomplished by the private sector. Recently, some functions that have traditionally been performed in-house by TxDOT are being considered for, or have been outsourced to some degree (e.g., certain maintenance, research, design, right-of-way management, rest areas, training, and certain aspects of human resource management, among others). In large part, this movement toward outsourcing functions traditionally performed in-house is due to personnel reductions within the department, TxDOT workforce inexperience, an emphasis on economic efficiency, and legislative mandates.

For example, between 1970 and 1995, TxDOT has experienced an effective workforce reduction from 21,000 employees to less than 15,000 employees. Normal attrition and the hiring of TxDOT personnel by the private sector has worked to reduce the capability of TxDOT to perform many functions in-house.

The emphasis on economic efficiency is an ongoing concern of a viable and progressive organization such as TxDOT. Moreover, HB 9, 72nd Legislature mandated that TxDOT contract 50% of the maintenance work if TxDOT could show that it was efficient to do so. HB9, 72nd Legislature also mandated that TxDOT contract not less than 25% of all dollars expended for vehicle maintenance and repair, providing that repair facilities exist and that TxDOT could save 10%. Rider 44, HB1, 75th Legislature mandated that TxDOT spend at least $207 million dollars during the next biennium on consultant contracts. It is expected that there will be a continuing legislative emphasis on outsourcing and privatization.

Even in light of the above described trends, TxDOT often lacks sufficient information necessary to (a) fully evaluate the effectiveness of functions which have been outsourced, and (b) make effective decisions regarding future outsourcing. Through intensive research, TxDOT sought to answer such questions as:

- What functions have been outsourced in TxDOT, other agencies, and in other state departments of transportation?
- What cost savings have been accomplished by outsourcing these functions?
- What additional costs have been incurred due to outsourcing these functions?
- How have costs of outsourcing escalated after the initial contract period?

- What quality differences, if any, exist between in-house and outsourced work?
- Of the agencies or organizations that have outsourced, how satisfied are they after 3-5 years?
- What outsourced functions have been brought back in-house?
- What functions are most efficient to outsource and what functions should be done in-house?
- Is a cost/benefit analysis of the outsource/in-house functions possible?
- What impact does outsourcing have on in-house capabilities?
- How do costs for outsourced functions vary as in-house capabilities are lost?
- When is outsourcing justified?
- What outsourcing legislation affects TxDOT efficiency?

2.2 Statement of the Problem

The problem of this study was to determine and evaluate the long-term impact and cost-effectiveness of outsourcing certain TxDOT functions.

2.3 Objectives of the Study

The objectives of this research were:

- to identify and evaluate TxDOT functions as they relate to outsourcing and to make specific recommendations as to which functions should be outsourced and which should be accomplished in-house;
- to provide TxDOT management with the specific information necessary to make informed and efficient decisions concerning outsourcing in each geographical and economic area of the state;
- to provide TxDOT administration with the information necessary to inform the Texas Legislature and the Governor's Office of statute changes required to make TxDOT more efficient in its approach to outsourcing; and
- to provide a model, decision tree or flow chart that would assist TxDOT managers in their outsourcing decision-making processes. Such a model would allow a manager to input specific work function information and would yield recommendations about the effectiveness of completing work in-house or outsourcing it.

2.4 Focus of the Study

The focus of this project was to review TxDOT's in-house capabilities versus private sector capabilities and to determine which sourcing arrangement would be the most efficient and beneficial to use relative to the functions studied. The focus included aspects of administration, accounting, information resources, human resources, planning, design, operations and maintenance. In-house construction was not a viable function to study and was not considered in this study.

The study gave consideration to geographic locations and local economic capabilities. Response times and emergency operations were also considered.

2.5 Report Organization

- Section 1.0 of this report is an executive summary of the findings and recommendations of the study.

- Section 2.0 presents the need and justification for the study, a statement of the problem, the research questions involved, and the objectives and focus of the study.

- Section 3.0 reviews the literature relevant to this study. Section 3.0 further presents and validates the research model used in the study.

- Section 4.0 details the research methods and procedures used in the study, including an explanation of the selection of the functions studied, selection of subjects and other sources of information, selection of outsourcing effectiveness evaluation factors, subjects, instrumentation, research procedures and response rates, and a description of the data treatment and analysis techniques utilized in the study.

- Sections 5.0 through 13.0 present an analysis of outsourcing each of the nine functions studied in this research. Each of these sections defines the function under study, presents both quantitative and qualitative data and analysis of the function, and lists the most frequently mentioned actual and potential suppliers of the functions under study. Also included in each of these sections is an assessment of the long-term impact and cost-effectiveness of outsourcing the function under study and recommendations on the outsourcing potential of the functions studied.

- Section 14.0 presents the functional sourcing decision support model proposed by this study.

- Section 15.0 is an extensive treatment of recommended approaches to vendor evaluation and partnering with suppliers.

- Section 16.0 contains a comprehensive list of references for all sections of this report.

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SECTION 3.0

LITERATURE REVIEW AND RESEARCH MODEL

3.1 Background and Literature Review

The last decade has witnessed increased privatization of many traditionally public functions. For the most part, privatization means that governments and other public organizations outsource, or in some cases relinquish, conventional operations to private industry suppliers. Privatization can also mean the development of internal ventures, strategic alliances with industry, or entrepreneurial activity. The goal of such reorientation is to achieve greater economy, higher quality, improved service delivery, and the promotion of free enterprise and competition. Evidence suggests that privatization can be successful, and that this trend will continue. Privatization is growing because it delivers major savings or improves service, quality, or both to local taxpayers. Privatization appears to be most successful in cases where a proactive stance is taken toward its implementation. Since some organizational restructuring and reengineering is a likely outcome of privatization efforts, opportunity analysis and impact evaluation by the sponsoring organization can mitigate the transition to new organizational forms.

The literature suggests that a need exists to objectively determine the extent to which current functions/operations may be efficiently and effectively outsourced. In this regard, *functional outsourcing* means purchasing entire functions/operations (or major portions thereof) from outside suppliers/vendors (firms) operating under contract. Properly analyzed, planned, and implemented, this form of privatization can reduce cost, improve delivery of services and increase stakeholder value. In this case, any in/out-sourcing assessment must include potential cost and benefit of outsourcing to an agency. The possible business opportunity afforded to potential contractors is also necessary. And further, because functional outsourcing represents major human resource, technical, and administrative reengineering for most ongoing organizations, coaching, development training, and continuing downstream consultation to effectively support any decision to outsource functions must be considered.

The most comprehensive study of DOTs outsourcing is that conducted under the sponsorship of the Transportation Research Board's National Research Council (*NCHRP Synthesis of Highway Practice 246: Outsourcing of State Highway Facilities and Services*, Transportation Research Board, National Research Council, Washington, D.C., 1997). Although Texas did not participate in this study, 34 states provided information in the areas of characteristics of contracted activities, factors influencing the decision to outsource, assessing outsource feasibility, impediments to outsourcing, pre- and post-award activities, the prevalence of cost-effectiveness and other analyses of outsourcing, found benefits of outsourcing, suggestions for successful outsourcing, problems in outsourcing, and issues surrounding public-private partnerships. The study found that the most frequently outsourced functions among the survey respondents, to some degree, were: administration (training), planning (research), design (plans and specifications), right-of-way (appraisals), construction management, operations (pavement markings), maintenance (roadway surfaces), urban area litter pickup, urban area

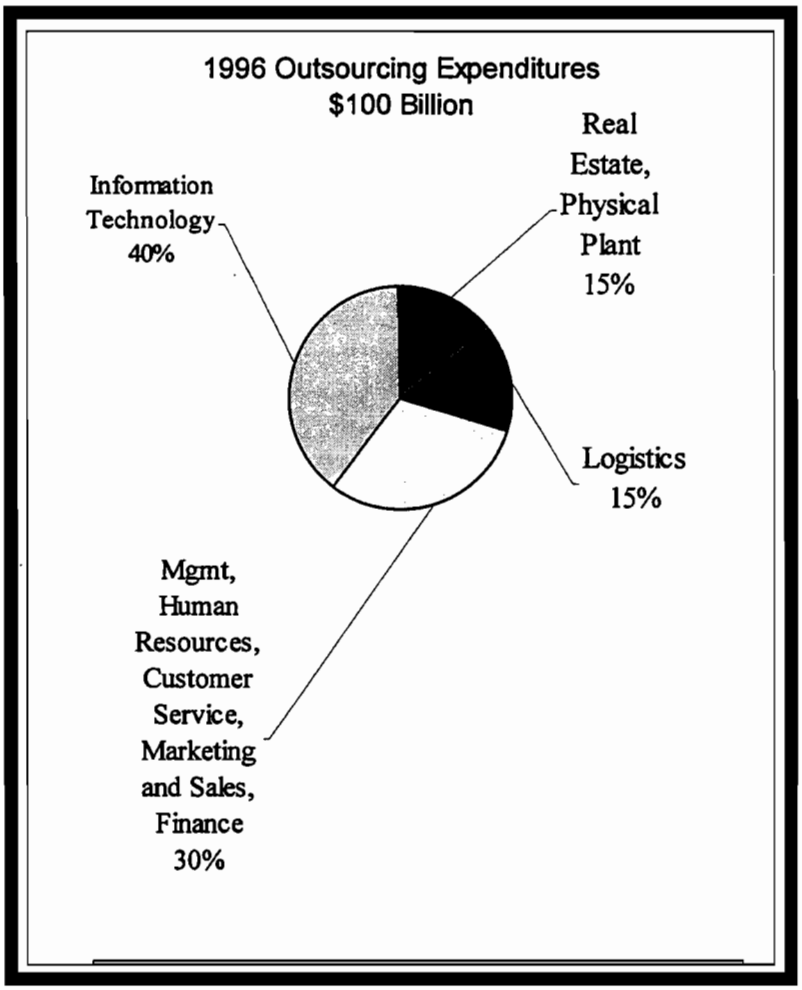
landscaping, and rest area management/maintenance.

According to study results released in May, 1997 from the Mountain View, California-based research company INPUT, nearly two-thirds of organizations plan to extend their business process outsourcing over the next three years. INPUT projects that the outsourcing market will reach $7.5 billion in 2001. The business processes that are most likely to be outsourced include payroll, accounting, and human resources administration. However, a report from the International Data Corporation projected that the global outsourcing market will exceed $121 billion by the year 2000. According to a 1997 Dun & Bradstreet report, of the 1.6 million companies in their information base, companies with less than 10 employees are the most likely to outsource. The most frequent industry using an outsourcing company is the business service sector. This industry is followed closely by retail trade, wholesalers and manufacturers. Industries with the lowest use of outsourcing include mining and public utilities. According to the same study, 30 percent of the companies using an outsourcing firm have sales in the $1 to $5 million dollar range. More than 63 percent of the companies using outsourcing services have been in business 11 years or more. Findings by the New York-based Outsourcing Institute indicate that on average, companies are realizing a 9-percent cost savings and a 15-percent increase in capacity and quality through outsourcing. Further, according to the Outsourcing Institute, outsourcing is very much a top-down decision, with 61 percent of companies stating that the decision to outsource "was the result of a senior executive directive." Almost three-quarters of companies use a request for proposals (RFP) to evaluate and select the winning supplier.

Outsourcing occurs when an organization purchases products or services from an outside supplier, rather than performing the same work within its own facilities, in order to cut costs or achieve effectiveness. The decision to outsource is a major strategic one for most organizations, since it involves weighting the potential cost savings against the consequences of a loss in control over the product or service. As shown in Figure 3-1, more than 100 billion dollars was spent on outsourcing in 1996. Some common examples of outsourcing include manufacturing of components, computer programming services, tax compliance and other accounting functions, and payroll and other human resource functions. According to research conducted by CFO: *The Magazine for Senior Financial Executives,* there were 146,000 outsourcers providing products or services to other companies in the United States as of December 1994, an increase of 65 percent from the 88,000 that existed in 1989.

The growth in outsourcing in recent years is partly the result of a general shift in business philosophy. Prior to the mid-1980s, many organizations sought to acquire other organizations and diversify their business interests in order to reduce risk. As more organizations discovered that there were limited advantages to running a large group of unrelated businesses, many began to divest subsidiaries and refocus their efforts on one or a few closely related areas of business. Organizations began to identify or develop core competencies, a unique combination of experience and expertise that would provide a source of competitive advantage in a given industry. All aspects of the organization's operations were aligned around the core competence, and any activities or functions that were not considered necessary to preserve it were then outsourced.

Figure 3.1 – Breakdown of 1996 Outsource Expenditures



Source: Corbett, 1997

Successful outsourcing requires a strong understanding of the organization's capabilities and future direction. Decisions regarding outsourcing significant functions are among the most strategic that can be made by an organization, because they address the basic organizational choice of the functions for which internal expertise is developed and nurtured and those for which such expertise is purchased. These are basic decisions regarding organizational design. Outsourcing based only upon a comparison of costs can lead organizations to miss opportunities to gain knowledge that might lead to the development of new products or technologies. Organizations that outsource too many of their core functions are often referred to as "hollow organizations" and may relinquish their reason for existence.

Outsourcing can be undertaken in varying degrees, ranging from total outsourcing to selective outsourcing. Total outsourcing may involve dismantling entire departments or divisions and transferring the employees, facilities, equipment, and complete responsibility for a product or function to an outside vendor. In contrast, selective outsourcing may target a single, time-consuming task within a department, such as preparing the payroll or manufacturing a minor component, which can be handled more efficiently by an outside specialist. The opposite of outsourcing is insourcing, when a staff function within an organization markets its product or service to external as well as internal customers.

Organizations that decide to outsource do so for a number of reasons. The primary reason is to achieve cost savings or to better cost control over the outsourced function. Organizations usually outsource to a vendor that specializes in a given function and performs that function more efficiently. Anticipated cost savings sometimes fail to materialize, however, because the vendor must make a profit and because the organization incurs additional transaction costs when interacting with a vendor. Another common reason for outsourcing is to achieve headcount reductions or minimize the fluctuations in staffing that may occur due to changes in demand for a product or service. Organizations also outsource in order to reduce the workload on their employees, or to provide more development opportunities for their employees by freeing them from tedious tasks.

Some organizations outsource in order to eliminate distractions and force themselves to concentrate on their core competencies. Still others outsource to achieve greater financial flexibility, since the sale of assets that formerly supported an outsourced function can improve cash flow. A possible pitfall in this reasoning is that many vendors demand long-term contracts, which may reduce flexibility. A common reason for outsourcing computer programming and other information technology functions is to gain access to new technology and outside expertise. Some experts claim, however, that organizations are exposed to new technology by vendors anyway, and that they could simply hire people with the expertise they seek. Organizational politics is another common reason for outsourcing. For example, some organizations might begin outsourcing initiatives after observing the successful efforts of a competitor. Others might be pushed toward outsourcing by managers seeking personal gain or by a desire to eliminate troublesome departments. Finally, outsourcing provides an attractive option for start-up firms as they grow.

Some of the major potential disadvantages to outsourcing include poor quality control, decreased organization loyalty, a lengthy bid process, and a loss of strategic alignment. There may also be inherent advantages of maintaining certain functions internally. For example, employees may have a better understanding of the industry, and their vested interests may mean they are more likely to make decisions in accordance with the organization's goals. A general rule is that an organization should never outsource any function that directly affects quality or service.

Once an organization has made the decision to outsource, there are still a number of factors it must consider in making a successful transition and forming a partner relationship with the vendor. Ethel Scully recommended a series of steps for organizations to follow in *National Underwriter*. First, the organization needs to obtain the support of key personnel for the decision to outsource. Many

organizations encounter resistance from employees who feel that their jobs are threatened by outsourcing. Scully suggested forming a team consisting of an outsourcing expert, representatives from senior management and human resources, and the managers of all affected areas of the organization to help address employee concerns about the decision. Then the organization can begin contacting potential vendors, either formally or informally, and asking specific questions about the services provided and the terms of the contract. It is also important for the organization to develop tangible measures of job performance before entering into an agreement. Finally, the organization should select a vendor it trusts in order to develop a mutually beneficial partner relationship.

In summary, some of the possible advantages of outsourcing are (Warren, et al, 1997):

- cost reduction, through economies of scale,
- cash influx through liquidation of assets and decrease in depreciation expense,
- access to technology without capital investment, and
- elimination of a large cost center within the organization and transfer to profit center within vendor's operation.

Possible drawbacks to outsourcing are (Warren, et al, 1997):

- loss of control,
- high exit barriers,
- conversion costs,
- increased executive management involvement,
- dependence on vendor reliability,
- concerns with long-term flexibility,
- ability to meet changing needs, and
- service-level contract agreements with outsourcer.

Outsourcing is a very common practice today. Both small and large organizations have used this method to pursue growth in the hyper competitive business arena. Despite the benefit that organizations have derived from outsourcing, there are also some impacts /risks that are associated with it. Currently, small businesses dominate the use of outsourcing, compared to large businesses.

A positive way of looking at it is through benefits that may come out of outsourcing. These benefits are: freeing up capital, making obstacles disappear, creating strategic advantage, sharper focus on core businesses, regular access to leading practices, long-term flexibility, and gaining expertise (Buss, 1995).

- ***Freeing up capital:*** Outsourcing often reduces operating costs, mainly because outside providers of a single type of service have a lower cost structure gained from economies of scale. This lower operating cost translates to saving in investment of capital in the operations and thus creating value. Organizations surveyed recently by the Outsourcing Institute reported their costs dropped an average of 9 percent in the functions they outsourced.

- ***Making obstacles disappear:*** The responsibility of maintaining the functions that are both complex and expensive will lie on the outsider. This makes managers of organizations' focus on the function that is more important. A survey conducted in 1994 of more than half the human resources and administrative officers stated that they had plans to outsource a growing list of functions.

- ***Creating strategic advantage:*** Outsourcing helps small organizations maintain a streamlined structure, closely managed growth, and spread risks. A business can expand rapidly by using outsourcing to deliver all the capabilities of a larger firm without the expense and delay of directly acquiring and managing each new resource needed.

- ***Gaining expertise and regular access to leading practices:*** Through outsourcing, a business owner can gain access to highly specialized, sophisticated services without having to add to the payroll or be obligated to use the specialist for a long time. Such option can prove especially helpful when an organization faces, for example, a key R&D project or marketing thrust. The practice also gives owners continuing access to state-of-the-art expertise on complex subjects, such as computer networking.

- ***Sharper focus on core business:*** With outsourcing, the business can focus themselves to do what they do best. They can outsource the rest of the functions that are not critical and compete based on core competencies.

- ***Long-term flexibility:*** Outsourcing gives long-term flexibility to the business to changing conditions of the business environment. The business can change the focus of outsourcing requirements on an as-needed basis. For example, they can shift focus to emphasize certain functions on the outsourcing to match with the changing condition of the business.

The negative consequences of outsourcing may include a reduction in employee morale, loss of skilled personnel, vulnerability, loss of control over vital resources, loss of competitive advantage, and strategic risks.

One of the impacts of outsourcing can be viewed from the reaction of some of the workers in an organization. When some of them hear the word "outsourcing", they assume their organizations or their jobs will disappear. Consequently, the word 'outsourcing' is often replaced with euphemisms such as "rightsizing" and "reinvention reengineering" (Bauer, 1996). One survey indicated that shows 61% of the managers have undergone a major restructuring such as downsizing or outsourcing in the past year. As a result of these changes, nearly 2/3 feel less secure in their jobs and are experiencing lower morale. More worrying, however, is the fact that nearly half of these managers indicate a significant decline in motivation and loyalty to their employers (Cooper, 1998).

There is also a danger of losing key highly skilled and trained personnel when outsourcing major functions. This sometimes happens when several functions of an organization are outsourced and some of the highly skilled and trained key personnel lose their jobs. This may affect the organization

because those skilled personnel might have training and skill that the business might not find in the outsource vendor.

The organization also faces strategic risks that includes (Quinn and Hilmer, 1994):

- ***Loss of critical skill or developing the wrong skill:*** There is always a risk of outsourcing the wrong skill and thus make the organization lose its ability to innovate. For example: a bicycle company that outsourced the manufacturing of their bicycle frame eventually lost their capacity to compete.

- ***Loss of cross functional skill:*** Sometimes innovation and/or invention are created from interaction between two or more groups in the organization. Outsourcing these functions will result in fewer interactions between these groups and thus limit the innovative results.

- ***Loss of control over a supplier:*** Since the suppliers are virtually outside the organization, sometimes the problem of control exists. This means that the buyers might not have full control of what the suppliers' do.

Another hazard of outsourcing is the loss of control of vital resources and competitive advantage. In outsourcing an entire function, sometimes vital resources are attached to that function and that might have future implications for the organization.

3.2 Selection and Validation of Functional Sourcing Evaluation Factors

The literature suggests that many factors should be considered in making a functional outsourcing decision and to evaluate the long-term impact and cost-effectiveness of outsourcing. While cost-benefit-opportunity analysis is still the most frequently recommended methodology for assessing outsourcing potential, more global factors are recommended for evaluation of long-term effectiveness.

The following evaluation factors are most frequently recommended by the literature: capacity requirements, need for confidentiality, need for control, cost analysis, equipment/facilities, inventory and procurement issues, legal issues, liability exposure, personnel issues, quality and reliability issues, supplier availability and needs, and volume requirements.

In the public sector, 12 factors have been found to affect decisions on transportation outsourcing: limited in-house capability, a need for specialized expertise or equipment, cost-effectiveness, quality, public demand for new services, statutory requirements, agency policies, seasonality of work, contractor availability, industry pressures, employee/union concerns, and emergencies.

The importance of certain evaluation factors is emphasized by attention to the following factor considerations:

Communication

Communication may generally be considered as the sharing of information. Outsourcing a particular function or activity may very well impact other areas or departments' communication practices by removing a link in the communication chain. Therefore, the communication flow between the function or activity being considered and other parts of the organization should be evaluated. One item to consider is whether there will be additional costs involved in relaying information to other areas if the function is outsourced, or whether the communication is necessary for operations (Free, 1997). The impact of information flow between the possible vendor and the organization and its departments should also be considered (Key, et. al, 1997).

Confidentiality

Confidentiality can fall into several different areas, including information about employees, customers, innovations, formulas, and proprietary technologies or processes that are part of the organization's competitive advantage. If the information is too critical to be released, then outsourcing may not be a viable choice. Patents and copyrights can help protect some trade secrets, but many competitors can back into this information (McCain, 1993).

Control

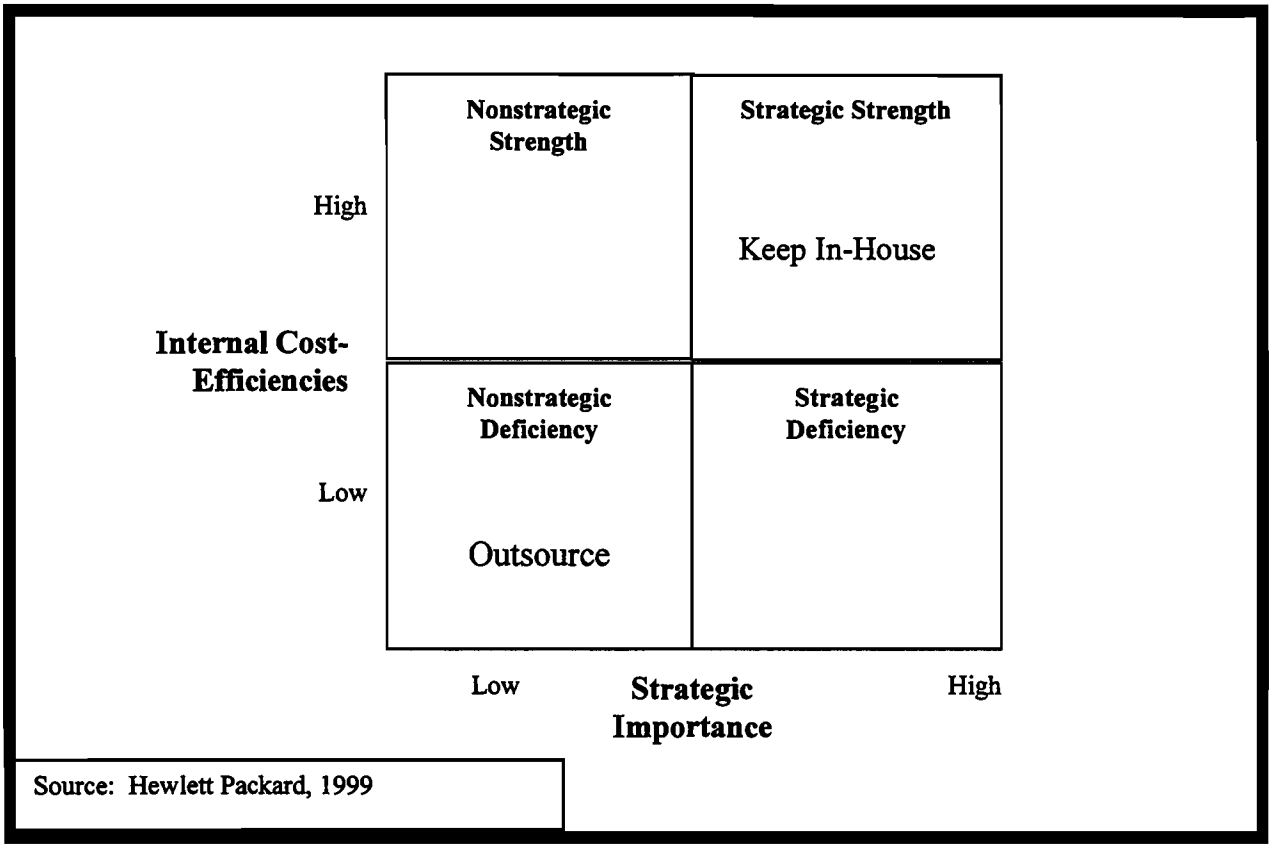
When making an outsourcing decision three levels of control must be considered: the level of control the organization currently has, how much the organization is willing to release, and how much is expected to be maintained by the vendor (Ponthieu, 1995). Control can become a critical issue when deciding to outsource an activity related to the production cycle in a manufacturing firm. If the vendor is unable to meet the required obligations, the operations of the organization could be seriously affected. Also, control is a primary consideration when considering the outsourcing of information technology services. Since the data of an organization can be the lifeblood of the decision-making processes, it is crucial that proper control be maintained.

Core Competencies

Core competencies are "the capabilities of a company that separates it from its competitors and serves as a basis for growth and diversification of product lines" (Argenti, 1998). They include those activities that provide a competitive advantage for the organization. Senior management generally performs a comprehensive analysis to determine what business functions are at the core of the organization's operations (Elliott, 1996). Through this analysis, management can evaluate the strengths and weaknesses of the members of the organization, apply the members' skills to a common task or objective, and coordinate efforts among organizational members (Argenti, 1998). In defining the organization's core competencies, management should determine what particular skills and factors comprise the organization's current position. Determining the aspects of the business that provide a chance to exploit new opportunities will assist in determining the core competencies (Argenti, 1998).

Hewlett Packard uses the following matrix (see Figure 3.2) when evaluating core competencies, internal efficiencies, and strategic implications (Hewlett Packard, 1999):

Figure 3.2 - Effect of Strategic Importance and Internal Cost-Efficiencies on Outsourcing



Source: Hewlett Packard, 1999

Using this matrix, the activities of the organization can be broken down into those of strategic importance and into those that allow for the gain of cost-efficiencies. For areas of low strategic importance and low internal cost-efficiencies, the organization should consider outsourcing. Another consideration is whether the function or activity is mission critical (Kelley, 1995).

Some suggested characteristics of core competencies include (Quinn and Hilmer, 1994a):

- skill or knowledge sets, not products or functions,
- flexible, long-term platforms,
- limited in number,
- unique sources of leverage in the value chain,
- areas where the organization can dominate,
- elements important to customers in the long run, and
- embedded in the organization's systems.

Once the organization has determined its core competencies, it needs to ensure that it maintains leverage over them. Managers should ensure that they are protected and should instead focus on outsourcing those functions or activities not considered core competencies.

Organizational Strategy and Systems

Strategy relates to an organization's mission, philosophy, goals, and objectives. It determines the type of business, hierarchical structure, and its commitment to customers, employees, and shareholders (Argenti, 1998). Understanding the organization's strategic vision and plan, and the organization's goals and objectives, will provide considerable insight as to whether the organization is receptive to outsourcing ("Survey of Current and Potential Outsourcing End Users," 1999). Things to consider include how critical the function or activity is to the corporate strategy and the level of organization support that will be received from the vendor ("In-House vs. Outsourcing....," 1998; Phillips, 1992). Another issue to be reviewed is the internal systems of the organization and whether outsourcing will hinder the current internal systems information flow.

Costs

Costs to be considered include both measurable monetary costs, as well as intangible costs. Not all costs will be capable of exact quantification, but it is imperative to obtain the best estimate possible. Categories of costs that should be included in the decision are direct and indirect, tangible and intangible, and discretionary and nondiscretionary. While the direct costs may be relatively simple to identify, it is the other categories of costs that can be difficult to determine. These costs include such items as administrative expenses, coordination costs with internal and external parties, training expenses, and information resources (Weighing the Cost of Outsourcing," 1996). The affect of outsourcing may also have cost effects on other parts of the organization. These costs should be considered as well (Harris, 1995).

Customer Service

Customer service can be considered the level of satisfaction provided to the ultimate consumers of the organization's products or services. It can be provided through a variety of ways, such as an actual customer service department, follow-up sales contact, warranty services, etc. If the potential outsourced function or activity is directly or indirectly related to the customer service level provided, the effect of the outsourcing decision should be considered. To begin, the current level of value added to the customer or the customer's perception of added value should be evaluated based on the current insourced function or activity (Weighing the Cost of Outsourcing," 1996).

Equipment/Facilities

Equipment refers to the machinery or apparatus used in the performance of a function or activity. Facilities refer to actual buildings, floor space within a building, land, etc., used in the performance of a function or activity. When considering equipment and facilities, the following should be

measured and considered: space used by equipment, historical cost of equipment, maintenance and repair costs, replacement cost, disposal cost, and whether the item(s) can be used elsewhere in the organization (Ponthieu, 1995).

Human Resources

Human resources refer to the employees of the organization and can be at any level or in any department or function of the organization. It is the people. The reaction of employees to an outsourcing decision will determine the smoothness of the transition. A decision to outsource can have monumental effects on employee morale, especially if it results in a layoff. The only way these problems may be minimized is through effective communication from top management (Lonsdale and Cox, 1997). Another area of the human resource area to be considered is training and retraining costs involved if a decision is made to outsource. If displaced employees can be relocated elsewhere in the organization, their current level of knowledge, skills, and experience must be evaluated, as well as the retraining cost (Fredericks, 1994). Other related costs that should be considered include classified advertising, overhead, administrative costs of hiring and terminating, taxes, and benefits (Tibbens, 1999). In addition, whether or not the organization is operating in a unionized industry or environment will have to be considered. The impact of the decision on the unionized group and their possible reaction(s) should be evaluated.

Inventory and Procurement

Inventory refers to products or product components maintained or stored for use in production or held until sale. Procurement is the process of obtaining those products or components from an external source and encompasses the costs of purchasing, transportation, distribution, and storage. The effect of outsourcing on the required inventory levels or on the procurement process must be evaluated.

Legal and Regulatory Issues

Legal and regulatory constraints of federal or state agencies can fall into many areas, including environmental restrictions and requirements, labor issues and product quality. A critical evaluation of the current regulatory compliance issues that constrain the organization and its operations and functions must be made (Cooke, 1998). Afterwards, the possible effect of outsourcing on these constraints must be evaluated.

Liability

Liability issues evolve around product warranties, labor disputes, standing vendor contracts, and any existing customer arrangements. All standing obligations should be closely reviewed for possible future lawsuits. Identify any problems that may or may not be resolved with an outsourcing relationship.

Organizational Culture

The culture of an organization can be considered the collective interest that results in the building of a unified organization, through shared systems, beliefs, habits, and traditions. It is an intrinsic part of the deeper organizational "character". The people in the organization have significant control over successful operations and functions. Their acceptance of an outsourcing decision may prove critical to the success of an outsourcing venture. Politicking, alienation, and competitor behavior are potential barriers to outsourcing that may result from the organizational culture.

Productivity

Productivity not only relates to an organization's capacity, the measure of the output of the organization, but also the efficiency of the operations (Argenti, 1998). Current in-house operations should be reviewed to determine if current capacity levels are being fully utilized. To determine capacity levels, an organization should measure a function's average and maximum amounts of output over a given time period (months, weeks, days). This measure can be calculated in hours and/or volume/quantity produced within a named time frame. One consideration when evaluating a service is the average and maximum number of calls/customers per hour, etc. Finally, the average volume of output that is currently being produced should be compared to expected volume levels. The productivity measurement will vary by the function or activity being considered. An organization will need to determine if the processes need reworking from within or if outsourcing could be a possibility for meeting existing or new capacity levels. Seasonal fluctuations and customer demand are two additional factors to consider when evaluating capacity (Argenti, 1998).

Quality and Reliability

Quality and reliability relate to that of the organization's product or service. If the function or activity being considered for outsourcing, either directly or indirectly, affect the quality or reliability then the current quality measurements must be determined. Another consideration is which party will be responsible for the monitoring or inspection of the quality measures if outsourcing is implemented. The current control procedures or those to be placed in operation if outsourcing is to be implemented must be thoroughly evaluated (Deloitte & Touche, 1999).

A factor analysis of all suggested outsourcing evaluation factors was conducted using the available literature, expert opinion in the field, and statistical factor analysis. The six factors shown in Table 3.1 were found to incorporate all questions and issues relative to evaluating the insource/outsource phenomenon, and were selected for purposes of this study. This overarching set of six factors was found to include the evaluation subfactors shown which formed the basis for construction of the survey statements (questionnaire) detailed in the Section 4.0 of this report. Table 3.2 specifically defines each evaluation Factor in terms of its subfactors. Finally, Table 3.3 provides a validation of the factors and subfactors by citing expert opinion referenced in the literature.

Table 3.1 - Outsourcing Effectiveness Evaluation Factors and Subfactors Used in this Study

Factors	Subfactors
External Mandates and Influences	• Legal, Regulatory, and Contractual Arrangements Issues • Liability Issues
Impact on Strategic and Organization Effectiveness	• Extent to Which the Function is a Core Competency • Criticality to Mission and Strategic Importance of the Function • Effect on Quality of Production • Need for Confidentiality • Need to Gain or Retain Technology • Effect on Customer Service • Need to Gain or Retain Critical Skills
Impact on Organization Systems and Operations	• Effect on Organization Strategy • Effect on Organization Systems and Administrative Procedures • Capacity, Volume, Scheduling, and Seasonality Issues • Effect on Output/Productivity • Effect on Inventory and Procurement • Effect on Communication and Interdependency Issues • Need to Control the Function • Contract Management Issues
Impact on Cost and Cost-Efficiency	• Cost and Cost-Efficiencies (internal-external, direct-indirect, tangible-intangible, and discretionary-nondiscretionary costs) • Equipment/Facilities Cost, Usage, Convertibility Considerations
Impact on Human Resources and Organization Culture	• Effect on Organization Culture and Core Organizational Values • Impact on Human Resources
Vendor-Related Factors	• Vendor Availability • Vendor Quality and Reliability • Vendor Relations • Vendor Cost and Cost Consistency

Table 3.2 - Factors Used to Assess the Long-Term Impact and Cost-Effectiveness of Outsourcing

Factor Number	Factor Name, Definition, and Included Subfactors
1	**External Mandates and Influences:** Evaluates any existing or potential external mandates and influences to insource/outsource the function under study, including all existing or proposed legal, legislative, regulatory, and/or contractual arrangements. Includes assessment of any existing or potential liability issues relative to insourcing/outsourcing the function under study.
2	**Strategic and Organization Effectiveness:** Evaluates the strategic importance of the function under study including its criticality to mission accomplishment and its role in establishing and/or sustaining competitive advantage. Assesses the extent to which the function is a core competency of the organization and the effects of insourcing/outsourcing the function thereon. Includes an assessment of confidentiality requirements of the function; insourcing/outsourcing effects on customer service; and the effects of insourcing/outsourcing the function on the quality of production. Includes an assessment of the need to gain or retain technology and/or critical skills through insourcing/outsourcing.
3	**Organization Systems and Operations:** Assesses the effect of insourcing/outsourcing the function under study on: organization strategy; organization systems; administrative procedures; capacity, volume, scheduling and seasonal variation factors; output and productivity; inbound and outbound logistics including inventory and procurement; communication and interdependency between and among departments; control of the function issues; and contract management considerations.
4	**Cost and Cost-Efficiency:** Assesses the cost and cost-efficiency of insourcing/outsourcing the function under study. Includes an assessment of all internal and external, direct and indirect, tangible and intangible, and discretionary and nondiscretionary costs. Includes consideration of the cost, usage and convertibility potential of related equipment and facilities.
5	**Human Resources and Organization Culture:** Assesses the impact of insourcing/outsourcing the function under study on human resources, organization culture, and the core values of the organization.
6	**Vendors:** Assesses the availability, quality and reliability, actual and potential relations, cost, and cost consistency of vendors (suppliers) relative to insourcing/outsourcing the function under study.

Table 3.3 - Selected Literature References and Information Sources Validating the Outsourcing Evaluation Factors and Subfactors Used in this Research*

* Complete references are in Section 16 of this report.

1	**External Mandates and Influences:** Legal, Regulatory, and Contractual Arrangement Issues: Bierce & Kenerson (1999), Clemons (1996), Cooke (1998), Hart (1988). Liability Issues: Bendor-Samuel (1998), Bierce (1999), Bragg (1998), Burnett (1998), Halvey (1996), Ross (1997).
2	**Impact on Strategic and Organizational Effectiveness:** Core Competencies: Buss (1995), McKenna (1996), Platt (1996), Quinn (1994), Underwood (1999). Criticality to Mission and Strategic Importance of the Function: Barnett (1996), Barnett (1997), Buss (1995), Dagger (1999), Doyle (1996), Goldman (1995), Kris (1998). Need for Confidentiality: Colby (1996), Harris (1997), McCune (1993), Mumma (1998), Sloane (1995). Effect of Quality of Production: Bender-Samuel (1997), Dole (1998), *Journal For Strategic Outsourcing Information* (1997), Kozlov (1999). Need to Gain or Retain Technology: Bierce (1999), Lacity (1993), Lacity (1998), Peak (1994). Effect on Customer Service: Bazinet (1998), Bendor-Samuel (1998), Bielski (1998), Deckelman (1997), Farnsworth (1998), Garner (1998), Gill (1998), Johnson (1998), Kenco Group (1997), Kriss (1996), Laios (1999), Matthews (1999), Simmons (1996), Vijayan (1997), Wong (1996). Need to Gain or Retain Critical Skills: King (1998), Lee (1995), Maniscalco (1995), Wojcik (1999).
3	**Impact on Organization Systems and Operations:** Effect on Organization Strategy: Barnett (1996), Barnett (1997), Buss (1995), Doyle (1996), McKenna (1996), Overton (1997), Project EASI/ED (1999), Quinn (1994). Effect on Organization Systems and Administrative Procedures: Barnett (1997), Buss (1995), Doyle (1996), Foster (1997), Project EASI/ED (1999). Capacity, Volume, Scheduling, and Seasonality Issues: Journal For Strategic Outsourcing Information (1997), Thiel (1999). Effect on Output/Productivity: Dole (1998), Strategic Sourcing (1998). Effect on Inventory and Procurement: Burnes (1997), Burt (1996), Ellram (1995), Hall (1996), Keeling (1999), King (1996), Ragatz (1997), Richardson (1997), Rognes (1995), Smeltzer (1997). Effect on Communication and Interdependency Issues: Bendor-Samuel (1998), Bragg (1998), Deckelman (1998), Hartridge (1998), Knott (1999), Mylott (1995).Need to Control the Function: Leithhead (1999), Rittenberg (1999), Speroni (1999). Contract Management Issues: hhttp://www.outsourcing-academics.com/html/acad12.html. http://www.outsourcing-academics.com/html/willc-c.html, http://www.outsourcing-mgmt.com/html/redefining, http://www.outsourcing-mgmt.com/mistake/how-1.html.
4	**Impact on Cost and Cost-Efficiency:** Cost and Cost-Efficiency: Bender-Samuel (1997), Bierce (1999), Corbett (1997), Corbett (1998), Doyle (1996), Everest Software Corp. (1996-1997), Straub (1998). Equipment/Facilities Cost, Usage, Convertibility Considerations: Blaik (1998), Hill (1972), Ponthieu (1995).
5	**Impact on Human Resources and Organization Culture:** Effect on Organization Culture and Core Organizational Values: Bendor-Samuel (1999), Doyle (1996), Field (1997), Project EASI/ED (1999), http://www.outsourcing-mgmt.com/mistake/why-6.html. Impact on Human Resources: Buck Consultants (1996), Davy (1998), Jacobs Engineering (1998), Katz (1998), Keeling (1999), Kralovetz (1996), Laabs (1998), Lever (1997), Longnecker (1997), Noecker (1998), Ochiogrosso (1998), Price Waterhouse Coopers BPO (1999), Pruter (1997), Ross (1997), Stewart (1996).
6	**Vendors-Related Factors:** Vendor Availability: Doyle (1996). Vendor Quality and Reliability: http://www.outsourcing-academics.com/accountablility/consequences, http://www.outsourcing-academics.com/html/acad5.html, http://www.outsourcing-mgmt.com/accountability/framework.html#start, http://www.outsourcing-mgmt.com/accountability/service.html. Vendor Relations: http://www.outsourcing-academics.c?tin-long&words=Contract+Management, http://www.outsourcing-mgmt.com/mistake/how-1.html#start, http://www.outsourcing-mgmt.how-4.html, http://www.outsourcing-mgmt/how-5html#start. Vendor Cost and Cost Consistency: http://www.outsourcing-academics.com/html.currie-b.html.

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SECTION 4.0

RESEARCH METHODS AND PROCEDURES

Research questions should guide research procedures. In this study, the nature of the research questions required the collection of both primary and secondary data derived from internal organizational operations, as well as information from external sources. Whereas Section 3.0 of this report provides the theoretical and evaluative framework for answering the research questions, this section includes an explanation of the research methods and procedures utilized in this study. More specifically, this section includes: an explanation of how the functions studied were selected; a description of the subjects and other sources of information utilized; a review of the procedure for selecting the outsourcing evaluation factors; an explanation of the survey instrument and scaling; research procedures followed; and data treatment procedures and analysis techniques employed.

4.1 Selection of Functions Studied

It was known from the inception of the 0-1829 research project that the major functions, subfunctions and activities of TxDOT numbered in the hundreds, and that time and other resource constraints would not allow intensive investigation and evaluation of all currently outsourced and potentially outsourceable TxDOT functions. Early study therefore concentrated on identification of representative and critical functions which would, if studied in depth, have the capability of answering the research questions posed. It was decided that such functions should be outsourced to some degree by the agency and/or have potential to be outsourced at some future date. Only by this means could the cost-efficiency and long-term effectiveness of outsourcing be determined.

The literature and the agency were extensively surveyed to determine a "punch list" of outsource representative functions. Figure 4.1 shows an early list of such functions, drawn from preliminary interviews with knowledgeable TxDOT officials and the work of the Transportation Research Board in the NCHRP Synthesis of Highway Practice 246, *Outsourcing of State Highway Facilities and Services*, 1997. The italicized functions in this list are those reported to be frequently outsourced to some extent by other state departments of transportation.

At a meeting of the researchers, the Project Director, the Project Coordinator, and senior TxDOT officials in Austin in October, 1998, the final decision was made regarding the functions to be investigated by this study. The TxDOT functions selected for study were:

1. Base-in-Place Repair
2. Paint-and-Bead Striping
3. Information Systems/Resources
4. Right-of-Way Acquisition
5. Facilities Management and Maintenance
6. Training, Quality and Development
7. Recruiting
8. Benefits Processing
9. Partnering/Quality Facilitation

Figure 4.1 - Major TxDOT Functions First Targeted for Outsourcing Effectiveness Evaluation

Audit: External Audits. **Construction, Operations, and Support**: Prequalification/Certification of Contractors, Inspection, Quality Assurance, *Management, Materials Testing, Pavement Markings, Sign Installation, Signal Installation, Traffic Information Services, Intelligent Transportation Systems (ITS), Toll Collection*, Warehousing. **Design**: *Consulting,* Inspection, *Surveying and Mapping, Location Studies, Plans and Specifications, Environmental Impact Studies, Design/Build (turnkey).* **Environmental**: Environmental Studies and Project Investigations; Congestion, Mitigation, Air Quality Programs. **Finance**: Accounting, Claims, Forecasting, Statistical Analysis. **General Services**: Purchasing, Printing, Records Management, Copy Centers, Food service, Groundskeeping, Housekeeping and Janitorial Services, Mail Services, Facilities Management and Maintenance (plumbing, HVAC, electrical and certain construction, welding, building maintenance, locksmithing, etc.), AV Media Centers, Records, Security. **Human Resources**: *Training and Development, Recruitment*, Testing, *Continuous Improvement Initiatives*, *Quality Facilitation*, Benefits Processing, Compensation, Benefits Planning. **Information Systems**: *Programming*, *Web Design and Maintenance*, Equipment Maintenance and Repair, *Database Management*. **Maintenance**: Leveling or Overlay with a Maintainer, *Mowing*, *Install or Reinstall Signs*, *Paint-and-Bead Striping*, *Base in Place Repair*, Aggregate Seal Coat, Base Removal and Replacement, Leveling or Overlay with Laydown Machinery, Litter, Guard Fence, Street Sweeping, Ditch Maintenance, District Equipment Shops (DES), Light Construction, *Roadway Surfaces, Shoulders, Roadside, Drainage, Bridges, Traffic Signals, Traffic Signs, Rest Areas.* **Motor Vehicles**: Licensing, Consumer Complaints. **Motor Carrier**: Permitting, Compliance and Enforcement. **Occupational Safety**: Training. **Public Transportation**: Planning, Consulting. **Right-of-Way**: *Appraisals, Acquisitions, Relocations.* **Traffic Operations**: *Traffic Surveys, Traffic Studies, Research Projects.* **Transportation Planning and Programming**: Consulting, *Research.* **Travel**: Travel Services, Promotional Programs. **Vehicle Titles & Registration**: Database Management, Theft Prevention Programs.

Italicized activities are those outsourced to some degree by other states as indicated in NCHRP Synthesis of Highway Practice 246, *Outsourcing of State Highway Facilities and Services*, 1997.

These functions were being performed in each of the 25 TxDOT districts at the time this study was conducted and were being outsourced to some extent by the agency as a whole. The central (division) offices primarily responsible for these functions at the state level were as follows:

Maintenance Division:	Base-in-Place Repair and Paint-and-Bead Striping
Right-of-Way Division:	Right-of-Way Acquisition
Information Systems Division:	Information Systems/Resources
General Services Division:	Facilities Management and Maintenance
Human Resources Division	Training, Quality and Development, Recruiting, Benefits Processing, and Partnering/Quality Facilitation.

4.2 Selection of Subjects and Other Sources of Information

This study sought to assess the actual and potential benefits of outsourcing nine TxDOT functions by gathering and evaluating information from the following primary and secondary information sources:

- the district office in each of the 25 TxDOT districts,
- the relevant central (division) offices concerned with the functions under study,
- benchmark information from other states concerning their outsourcing practices relative to the functions under study,
- actual and/or potential vendors (suppliers) of these functions, and
- benchmark practices suggested by the outsourcing literature.

4.3 Selection of Outsourcing Effectiveness Evaluation Factors

As discussed in Section 3.0 of this report, a factor analysis of all suggested outsourcing evaluation Factors was conducted using the available literature, expert opinion in the field, and statistical factor analysis.

The six factors shown in Table 4.1 were found to incorporate all questions and issues relative to evaluating the insource/outsource phenomenon, and were selected for purposes of this study. This overarching set of six factors was found to include the evaluation subfactors shown in Table 4.2. These subfactors formed the basis for construction of the survey statements in the questionnaire (survey) described in the next section of this report.

Table 4.1 - Factors Used to Assess the Long-Term Impact and Cost-Effectiveness of Outsourcing

Factor Number	Factor Name, Definition, and Included Subfactors
1	**External Mandates and Influences:** Evaluates any existing or potential external mandates and influences to insource/outsource the function under study, including all existing or proposed legal, legislative, regulatory, and/or contractual arrangements. Includes assessment of any existing or potential liability issues relative to insourcing/outsourcing the function under study.
2	**Strategic and Organization Effectiveness:** Evaluates the strategic importance of the function under study including its criticality to mission accomplishment and its role in establishing and/or sustaining competitive advantage. Assesses the extent to which the function is a core competency of the organization and the effects of insourcing/outsourcing the function thereon. Includes an assessment of confidentiality requirements of the function; insourcing/outsourcing effects on customer service; and the effects of insourcing/outsourcing the function on the quality of production. Includes an assessment of the need to gain or retain technology and/or critical skills through insourcing/outsourcing.
3	**Organization Systems and Operations:** Assesses the effect of insourcing/outsourcing the function under study on: organization strategy; organization systems; administrative procedures; capacity, volume, scheduling and seasonal variation factors; output and productivity; inbound and outbound logistics including inventory and procurement; communication and interdependency between and among departments; control of the function issues; and contract management considerations.
4	**Cost and Cost-Efficiency:** Assesses the cost and cost-efficiency of insourcing/outsourcing the function under study. Includes an assessment of all internal and external, direct and indirect, tangible and intangible, and discretionary and nondiscretionary costs. Includes consideration of the cost, usage and convertibility potential of related equipment and facilities.
5	**Human Resources and Organization Culture:** Assesses the impact of insourcing/outsourcing the function under study on human resources, organization culture, and the core values of the organization.
6	**Vendors:** Assesses the availability, quality and reliability, actual and potential relations, cost and cost consistency of vendors (suppliers) relative to insourcing/outsourcing the function under study.

Table 4.2 - Outsourcing Effectiveness Evaluation Factors and Subfactors Used in this Study

Factors	Subfactors
External Mandates and Influences	• Legal, Regulatory, and Contractual Arrangements Issues • Liability Issues
Impact on Strategic and Organization Effectiveness	• Extent to Which the Function is a Core Competency • Criticality to Mission and Strategic Importance of the Function • Effect on Quality of Production • Need for Confidentiality • Need to Gain or Retain Technology • Effect on Customer Service • Need to Gain or Retain Critical Skills
Impact on Organization Systems and Operations	• Effect on Organization Strategy • Effect on Organization Systems and Administrative Procedures • Capacity, Volume, Scheduling, and Seasonality Issues • Effect on Output/Productivity • Effect on Inventory and Procurement • Effect on Communication and Interdependency Issues • Need to Control the Function • Contract Management Issues
Impact on Cost and Cost-Efficiency	• Cost and Cost-Efficiencies (internal-external, direct-indirect, tangible-intangible, and discretionary-nondiscretionary costs) • Equipment/Facilities Cost, Usage, Convertibility Considerations
Impact on Human Resources and Organization Culture	• Effect on Organization Culture and Core Organizational Values • Impact on Human Resources
Vendor-Related Factors	• Vendor Availability • Vendor Quality and Reliability • Vendor Relations • Vendor Cost and Cost Consistency

4.4 Instrumentation, Survey Statements and Scaling

The generic evaluation factor and subfactor analysis formed the basis for formulation of the statements contained in the functional outsourcing assessment instrument shown in Figure 4.2. This instrument included 30 quantitatively assessed statements (statements 1-30) evaluated on a scale of 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree, and four qualitative statements (statements 31-34). The factor - statement relationship for statements 1 - 30 was as is shown below. Please note the following:

- The same statements were given to all districts and appropriate central offices relative to the functions under study with district/central office reference changed accordingly. The statements below (and in Figure 4.2) are written from a district's point of view, but the same statement was asked of the central office with wording changed to assure comparability.

- It was estimated the districts and the central offices would vary widely in the extent to which they outsourced the function under study -- some little or none, others a lot. The statements were formulated so that respondents could answer regardless of the amount of the function they currently outsourced. In effect, each statement was formulated so that all points-of-view would be represented, responses representing both actual and potential outsourceability.

- Subjects were instructed that "outsourcing" was synonymous with "contracting-out", "insourcing" was synonymous with "perform in-house", and "this function" was synonymous with "this activity".

- All statements were written so that a response of 3.0 or greater would favor insourcing except in statements 11, 18, 20, 21 and 25 where 3 or greater would favor outsourcing. In data analysis, the responses to 11, 18, 20, 21 and 25 were reversed to equalize the data and provide comparability. Thus, an average response of 3.0 or greater would favor insourcing and an average response on less than 3.0 would favor outsourcing, relative strength considered.

- (F = factor, S = statement)

F1. Outsourcing As Impacted by External Mandates and Influences (3 statements)

S4. There are regulations or laws that would prohibit this district from outsourcing this function.
S5. There are arrangements or contractual agreements with suppliers, customers, or other parties that make it difficult for this district to outsource this function.
S22. There are (may be) significant liability problems in contracting-out this function.

F2. Outsourcing Impact on Strategic and Organization Effectiveness (7 statements)

S1. This function is a core competency of this district and should not be contracted out.
S2. This function is of high strategic importance and its performance in-house is critical to

accomplishing the mission of this district.

S3. This function deals with confidential information. Revealing such information to outside vendors may have a detrimental effect on this district.

S10. Outsourcing this function results in (would result in) a negative reaction from the general public, customers, or other stakeholders.

S13. Contracting out this function negatively affects (would negatively affect) the quality of output of this function.

S17. This function should be performed in-house because the critical human resource skills we have in this activity cannot be matched by external vendors.

S29. This function should be performed in-house because of critical technology we have in this activity that cannot be matched by external vendors. ("Technology" means knowledge, information, systems, proprietary processes, hardware, etc.)

F3. Outsourcing Impact on Organization Systems and Operations (9 statements)

S6. This function is interdependent with other functions of the district. Outsourcing this function negatively impacts (would negatively impact) effective interaction of district functions.

S8. Outsourcing this function negatively impacts (would negatively impact) the organization strategy, systems, and/or administrative procedures of this district.

S12. Contracting out this function negatively impacts (would negatively impact) the productivity or quantity of output of this function.

S14. Outsourcing this function would result in significant capacity, volume, or scheduling problems in this district.

S19. The seasonal fluctuation of activity in this function makes it difficult to outsource this function.

S21. We anticipate no significant contract administration difficulties if this function is contracted-out.

S23. Outsourcing this function results in (would result in) inventory and procurement problems in this district.

S28. Outsourcing this function results in (would result in) significantly new tasks and responsibilities for this district.

S30. Outsourcing this function makes it (would make it) difficult to maintain control of this activity.

F4. Outsourcing Impact on Cost and Cost-Efficiency (4 statements)

S16. All costs considered, insourcing this function costs less than outsourcing it. ("All costs" means all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary costs.)

S18. Outsourcing this function results in (would result in) greater cost-efficiencies to the department than does in-house performance of this activity.

S25. Outside vendors can provide this activity at significant cost savings to this district.

S27. This function should not be outsourced because of the sizable capital investment we have in equipment and/or facilities allocated to this function. ("Investment" means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)

F5. Outsourcing Impact on Human Resources and Organization Culture (4 statements)

S7. Outsourcing this function negatively impacts (would negatively impact) the culture or organizational values of this district.

S9. Outsourcing this function results in (would result in) employees losing loyalty and faith in our organization.

S11. Most of the employees who currently perform this function in-house have been (would be) retrained and relocated to other areas of the organization under conditions of outsourcing this function.

S15. Outsourcing this function has (would have) a negative economic or social impact on our current employees.

F6. Outsourcing Influenced by Vendor Related Factors (3 statements)

S20. There is a sufficient number of available, quality, and reliable vendors of this function in this district.

S24. Outsourcing this function results in (would result in) significant vendor-relation problems.

S26. Outside vendors may (do) raise their prices without cause after the initial contract period under conditions of outsourcing this function.

4.5 Research Procedures and Response Rates

- The research instrument was pilot tested on a select group of 60 senior level college business students and 18 operating private sector business managers having outsourcing experience. This methodology is consistent with other studies when testing an instrument for reliability and readability. An SPSS factor analysis was completed and all statements loaded onto the evaluation factors selected. The Cronbach's alpha for the survey instrument used in this study was 0.91.

- Nine surveys (1 for each of the nine functions under study) were sent to each of the 25 district offices of TxDOT. In addition, one survey for each function was sent to the appropriate central office as described in Section 4.1 above.

- Assurances were given to the districts that responses would be held confidential in reporting the data; that quantitative and qualitative responses would not be capable of being traced to particular districts. This approach was used to assure candor in assessment and participation in the study.

- An economic and vendor analysis was completed for each district and for the state as a whole. This was conducted to round out the assessment of the actual and potential for outsourcing by the respondents of the functions under study.

- A nine-state survey was completed to benchmark practices by other states relative to the functions selected for study.

- Completed surveys on each of the nine functions were received from all 25 districts and one completed survey for each appropriate survey from the applicable central office of TxDOT. A response rate of 100 percent was therefore achieved in this study.

- Data were treated and analyzed as described in Section 4.6 of this report.

Figure 4.2 - Survey Instrument: Cover/Instruction Page

Base-in-Place Repair

(Maintenance Codes 120 & 851)

District-Level Outsourcing Survey

This confidential survey seeks to determine TxDOT district-level reaction to the potential and actual contracting out of the above-named function consistent with the objectives of TxDOT Research Project Number 0-1829.

- ☞ Please evaluate each of the following statements relative to the above-named function using the scale provided to indicate your assessment.
- ☞ The 25 districts vary widely in the extent to which this function is outsourced (some a lot; others little or none). ***Please respond to each statement regardless of the amount of this function you currently outsource.*** Each statement is written so that all points-of-view will be represented.
- ☞ Each district will complete only one (1) survey relative to the above-named function. Please assure that your response represents a district point-of-view.
- ☞ "Outsourcing" means the same as "contracting-out".
- ☞ "Insourcing" means the same as "perform in-house".
- ☞ "This function" means the same as "this activity".
- ☞ Feel free to write comments on the survey or on separate sheets.
- ☞ Please forward any supporting documentation (internal or external studies, reports, cost analyses, etc.) relative to this function that would be helpful in determining the outsourcing potential of this function.
- ☞ Please complete and return your survey as soon as possible.

Please mail this completed survey with any attachments you may have to: Dr. Louis D. Ponthieu, University of North Texas, Box 311234, Denton, TX 76203. Please e-mail any questions you may have to ponthieu@unt.edu, or call 940.565.3155. FAX responses to 940.565.4394.

Figure 4.2 (continued) - Survey Instrument Statements

Base-in-Place Repair

5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree

1. This function is a core competency of this district, and should not be contracted out.
2. This function is of high strategic importance, and its performance in-house is critical to accomplishing the mission of this district.
3. This function deals with confidential information. Revealing such information to outside vendors may have a detrimental effect on this district.
4. There are regulations or laws that would prohibit this district from outsourcing this function.
5. There are arrangements or contractual agreements with suppliers, customers, or other parties that make it difficult for this district to outsource this function.
6. This function is interdependent with other functions of the district. Outsourcing this function negatively impacts (would negatively impact) effective interaction of district functions.
7. Outsourcing this function negatively impacts (would negatively impact) the culture or organizational values of this district.
8. Outsourcing this function negatively impacts (would negatively impact) the organization strategy, systems, and/or administrative procedures of this district.
9. Outsourcing this function results in (would result in) employees losing loyalty and faith in our organization.
10. Outsourcing this function results in (would result in) a negative reaction from the general public, customers, or other stakeholders.
11. Most of the employees who currently perform this function in-house have been (would be) retrained and relocated to other areas of the organization under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the productivity or quantity of output of this function.
13. Contracting out this function negatively affects (would negatively affect) the quality of output of this function.
14. Outsourcing this function would result in significant capacity, volume, or scheduling problems in this district.
15. Outsourcing this function has (would have) a negative economic or social impact on our current employees.
16. All costs considered, insourcing this function costs less than outsourcing it. ("All costs" means all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary costs)

Figure 4.2 (continued) - Survey Instrument Statements

Base-in-Place Repair

5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree

17. This function should be performed in-house because the critical human resource skills we have in this activity cannot be matched by external vendors.

18. Outsourcing this function results in (would result in) greater cost-efficiencies to the department than does in-house performance of this activity.

19. The seasonal fluctuation of activity in this function makes it difficult to outsource this function.

20. There is a sufficient number of available, quality, and reliable vendors of this function in this district .

21. We anticipate no significant contract administration difficulties if this function is contracted-out.

22. There are (may be) significant liability problems in contracting-out this function.

23. Outsourcing this function results in (would result in) inventory and procurement problems in this district.

24. Outsourcing this function results in (would result in) significant vendor-relation problems.

25. Outside vendors can provide this activity at significant cost savings to this district.

26. Outside vendors may (do) raise their prices without cause after the initial contract period under conditions of outsourcing this function.

27. This function should not be outsourced because of the sizable capital investment we have in equipment and/or facilities allocated to this function. ("Investment" means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)

28. Outsourcing this function results in (would result in) significantly new tasks and responsibilities for this district.

29. This function should be performed in-house because of critical technology we have in this activity that cannot be matched by external vendors. ("Technology" means knowledge, information, systems, proprietary processes, hardware, etc.)

30. Outsourcing this function makes it (would make it) difficult to maintain control of this activity.

31. What percent of expenditures for this function did your district outsource in 1998?

32. What is your estimate of the amount of $$ cost savings that results (would result) from outsourcing this function in your district?

33. Please provide a list of actual/potential vendors of this activity available to your district. A company name, address and telephone contact number would be helpful on each.

34. Please provide any additional information, comments, observations or evaluations relative to outsourcing/insourcing this function in your district.

4.6 Data Treatment and Analysis Techniques Utilized

Data were analyzed using the General Linear Model Univariate (GLM) procedure in the SPSS 9.0 for Windows statistical analysis platform. The GLM Univariate procedure provides analysis of variance for one dependent variable (agreement/disagreement with outsourcing in this case) by one or more factors and/or variables (outsourcing evaluation factors and regions). The factor variables divide the population into groups. Using this General Linear Model procedure, one can test hypotheses about the effects of other variables on the means of various groupings of a single dependent variable. In other words, it would test a hypothesis about the difference in means of dependent variables among different factors. This procedure investigates interactions between factors, as well as the effects of individual factors. In addition, the effects of covariates and covariate interactions with factors were included. The GLM assumes that the dependent variable is quantitative, factors are categorical, and that they have numeric values or string values of up to eight characters. The Model also assumes that covariates are quantitative variables that are related to the dependent variable. The data collected for this study meet the requirement of the GLM.

After an overall F test was significant, a post hoc test was used to evaluate differences among specific means. Once differences were determined to exist among the means, post hoc range tests and pairwise multiple comparisons were used to determine which means significantly differed. The post hoc multiple comparison tests were performed for each dependent variable separately. Comparisons were then made on unadjusted values. These tests were used for fixed, between-subjects factors only. Tukey's Honestly Significant Difference (HSD) test was used for multiple comparisons. Tukey's test uses the Studentized range statistic to make all pairwise comparisons between groups and sets the experimentwise error rate to the error rate for the collection for all pairwise comparisons.

In reporting, mean column numbers represented the average degree of disagreement with outsourcing for individual factors, individual regions and overall average disagreement, where 5.0 represents strongest disagreement and 1.0 represents strongest agreement. Therefore, a number less than 3.0 favored outsourcing, a number greater than 3.0 favored insourcing.

For GLM Univariate Analysis, a significant difference on a factor(s) and/or a region(s) meant that factors and/or regions differed in the strength to which they agreed or disagreed with outsourcing the function in question. A lower number indicated agreement with outsourcing, a higher number favored insourcing, relative strength considered.

The survey questions were divided into six factors: 1. External Mandates and Influences, 2. Strategic and Organization Effectiveness, 3. Organization Systems and Operations, 4. Cost and Cost- Efficiency, 5. Human Resources and Organization Culture, and 6. Vendor-Related Factors.

Responses were collected from 25 districts and one central office for each of the nine functions studied. The districts were divided into 3 regions: 1 - metro districts, 2 - urban districts, and 3 - rural districts. The central office of concern was designated region 4. Thus 4 regions constituted the regions covariate for purposes of data analysis in this study.

The regional breakdown of the districts followed accepted TxDOT district size categorization. Small, Medium and Large in size is a relative differentiation based on population, budget, employment, etc., rather than a geographic differentiation (e.g. square miles). Each district below is also designated below by its accepted 3 letter code.

Metropolitan Districts (Large in Size)

1. Austin (AUS)
2. Dallas (DAL)
3. Fort Worth (FTW)
4. Houston (HOU)
5. San Antonio (SAT)

Urban Districts (Medium in Size)

1. Beaumont (BMT)
2. Corpus Christi CRP
3. El Paso (ELP)
4. Lubbock (LBB)
5. Pharr (PHR)
6. Tyler (TYL)
7. Waco (WAC)

Rural Districts (Small in Size)

1. Abilene (ABL)
2. Amarillo (AMA)
3. Atlanta (ATL)
4. Brownwood (BWD)
5. Bryan (BRY)
6. Childress (CHS)
7. Laredo (LRD)
8. Lufkin (LFK)
9. Odessa (ODA)
10. Paris (PAR)
11. San Angelo (SJT)
12. Wichita Falls (WFS)
13. Yoakum (YKM)

For purposes of this analysis, the central office of the function under study was designated as a Region. The Regions in analysis were as follows:

Region 1 - metro districts as above

Region 2 - urban districts as above

Region 3 - rural districts as above

Region 4 - central (division) office

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SECTION 5.0

SOURCING THE TXDOT BASE-IN-PLACE REPAIR (BIPR) FUNCTION

5.1 Introduction: Function Definition, Organization and Current Situation

Base-in-Place Repair (BIPR) is defined as in place repair of existing base and/or subgrade material. It includes resurfacing, but may or may not include additional stabilizing material, and is classified as maintenance codes (MC) 120 and 851. This function is performed in most of the 25 TxDOT districts, and is administered statewide by TxDOT's Maintenance Division.

The Maintenance Division (central office) includes administration, maintenance, facilities management and vegetation management sections and currently has 66 employees. The division supports 25 districts consisting of approximately 283 maintenance sections, 52 special offices and 116 area offices as well as other divisions and administration.

The Maintenance Section supports and manages the statewide maintenance function. This includes many extremely diverse activities including supporting routine maintenance contracting, the state-use program, maintenance management, establishing maintenance policies, maintenance budgeting, maintenance agreements and being the department's emergency management coordinator. They were instrumental in acquiring an additional $250M for the district maintenance budgets.

In 1998, a record 434 state-let routine maintenance projects were processed and the division acquired the approval of the administration to increase the letting authority of the districts from $100,000 to $300,000. The districts let 934 routine maintenance contracts and 24 emergency maintenance contracts due to extreme flooding in central Texas.

The Facilities Management Section provides architectural services for all departmental buildings. The Facilities Management Section and the Maintenance Section coordinated on the development of a new "Rest Area Improvement Plan" that will guide the rehabilitation, reconstruction, closing and new development of rest areas across the state for the next 10 years. The division also led the effort to get funding for the Rest Area program with the resulting approval to utilize the federal "enhancement" program for construction of new rest areas. The Facilities Section designed and constructed over $60 million in facility projects providing new or remodeled workspaces for 24 maintenance sections, 18 area engineers, and 7 other facilities such as vehicle titles and registration offices and district labs. New offices were added at 11 district headquarters around the state including a brand new complex for the El Paso District.

The Vegetation Management Section of the division serves as a source of statewide support and expertise on the management of the 800,000-plus acres of vegetated roadside within the transportation system. This staff provides assistance to the districts in the many roadside activities which have a direct impact upon the environment and our state's natural resources. The Vegetation Management Section develops guidelines and training programs to help stabilize and revegetate

disturbed portions of our roadsides, maintains approved product lists of erosion control products based upon extensive field performance research, and publish numerous booklets on roadside vegetation management. This section also serves as a clearinghouse of information regarding the Department's wildflower program.

The Vegetation Management Section assists the districts in researching products and developing integrated vegetation management plans that utilize mechanical, chemical, cultural, biological and alternative treatment methods to effectively manage the roadside. Staff provides extensive training to over 1,200 TxDOT employees annually on the safe use of pesticides and pesticide application equipment as required to control weedy or dangerous vegetative species, and works closely with the General Services Division Shops in the design, fabrication and use of advanced, computer-controlled herbicide application equipment.

The Vegetation Management Section assists districts in development of management plans where threatened or endangered plant species exist on the rights-of-way. This section manages the award program created by Ladybird Johnson through the Highway Beautification Awards and the newly created Vegetation Management Awards.

As indicated in Table 5.1, the Maintenance Division outsources approximately 44% of expenditures for Base-in-Place repair statewide. The districts reported a range from 0-55% BPIR outsourced, with the average being about 45%. Some districts reported no expenditure for this activity.

5.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 5.2 presents the Base-in-Place Repair Outsourcing Survey results (raw data) by question number, district, and central office response. Table 5.2b is provided for interpretation of survey responses.

In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor-Related Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 5.1 - Base-in-Place Repair Total Expenditures, 1995-1998. (I = $ amount Insourced, O = $ amount Outsourced)

DIST	1998			1997			1996			1995		
	Total	I	O	Total	I	O	Total	I	O	Total	I	O
ABL	236481	235584	897	239136	239136	0	579392	554159	25233	235761	235761	0
AMA	452124	452124	0	376328	376328	0	216123	216123	0	342673	342673	0
ATL	273086	273086	0	512699	508619	4080	412252	403207	9045	217319	217317	2
AUS	17785	17785	0	31239	31239	0	578	578	0	60314	5591	54723
BMT	633696	633696	0	842522	842522	0	601839	577544	24295	558418	558418	0
BRY	2648430	2512620	135810	3175377	3165827	9550	3210188	3210188	0	3093427	3093427	0
BWD	158091	158091	0	140177	140177	0	153716	153716	0	103719	103719	0
CHS	573646	573646	0	887666	887666	0	383447	383447	0	291931	291931	0
CRP	591578	591578	0	927144	421707	505437	182295	182295	0	808081	453749	354332
DAL	4285	4285	0	8937	8937	0	78629	39592	39037	13734	13734	0
ELP	141412	141412	0	83499	83499	0	250033	238281	11752	390509	142125	248384
FTW	138890	138890	0	59519	59519	0	282917	282917	0	129337	129337	0
HOU	40497	8531	31966	11228	11228	0	7130	7130	0	14834	9059	5775
LBB	180355	177782	2573	350914	308902	42012	-10550	-7526	-3024	512394	285722	226672
LFK	754346	576562	177784	646422	436538	209884	968618	646639	321979	708071	632566	75505
LRD	4358	4358	0	14094	14094	0	13654	13654	0	141138	141138	0
ODA	16826	16826	0	101682	101682	0	9937	9937	0	174097	174097	0
PAR	6181906	369400	5812506	5113483	875812	4237671	2817663	888254	1929409	4529095	906006	3623089
PHR	442647	442647	0	78816	78816	0	63839	63839	0	22468	22468	0
SAT	2879973	614771	2265202	1483975	847568	636407	909565	721581	187984	492098	492098	0
SJT	768808	329762	439046	101084	101084	0	297528	297528	0	84876	4384	80492
TYL	574603	264398	310205	100380	91928	8452	32427	32427	0	395336	154367	240969
WAC	164763	164763	0	209190	209190	0	360730	360728	2	203338	203342	-4
WFS	21988	21988	0	40597	40597	0	153048	153048	0	2564	2564	0
YKM	3049536	3049536	0	2879990	2879611	379	2566819	2566819	0	2352901	2352901	0
TOTAL	20950110	11774121	9175989	18416098	12762226	5653872	14541817	11996105	2545712	15878433	10968494	4909939

Table 5.2 - Base-in-Place Repair Outsourcing Survey Results by Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	1	2	5	2	3	3	4	4	4	2	3	4	3	2	5	3	1	3	2	4	3	2	5	2	4	3.0	**2**
2	2	2	5	2	4	2	4	4	5	4	3	5	3	2	4	4	1	3	2	4	5	2	5	1	2	3.2	**2**
3	1	2	1	1	2	1	1	2	1	1	2	1	1	1	2	2	1	1	1	1	2	1	3	1	1	1.4	**1**
4	1	2	1	1	1	1	1	1	1	1	2	1	1	1	2	2	1	1	2	2	1	1	4	1	1	1.4	**1**
5	1	2	1	1	2	3	1	1	1	2	2	2	2	2	2	2	1	3	2	2	2	1	4	1	2	1.8	**2**
6	4	2	3	1	2	2	4	4	5	2	3	3	3	2	3	2	1	2	2	2	2	1	4	2	2	2.5	**2**
7	2	2	5	1	2	4	3	4	4	2	3	4	2	2	3	3	1	3	2	1	2	1	4	1	2	2.5	**2**
8	2	2	2	1	2	2	2	2	4	2	3	3	2	2	3	2	1	3	2	2	2	1	4	2	2	2.2	**2**
9	4	2	5	1	4	4	4	3	5	3	4	4	2	2	4	3	2	3	2	2	3	1	5	2	2	3.0	**3**
10	2	2	4	2	4	3	4	1	3	2	3	2	2	2	3	2	2	2	3	2	3	1	1	1	2	2.3	**2**
11	2	1	4	3	4	2	2	4	5	5	4	2	4	4	2	4	3	2	1	2	**3**	4	5	5	5	3.3	**5**
12	2	2	5	2	4	2	5	3	2	2	4	4	2	2	4	2	2	3	1	5	4	1	5	2	4	3.0	**2**
13	3	2	5	2	4	2	5	4	2	2	4	4	2	2	3	2	2	3	3	5	3	1	5	2	2	3.0	**2**
14	2	2	3	2	4	4	5	3	2	3	3	3	4	2	3	2	2	4	2	2	2	1	5	3	2	2.8	**2**
15	3	2	3	2	3	3	5	2	2	2	3	3	4	2	4	3	2	4	2	2	2	1	5	2	2	2.7	**2**
16	3	5	4	3	4	3	4	5	2	3	4	4	5	2	5	3	3	4	4	5	5	2	5	4	4	3.8	**5**
17	2	2	3	2	4	2	4	4	2	2	3	2	3	2	3	3	2	1	3	2	2	1	5	2	2	2.5	**2**
18	3	2	1	3	4	3	1	4	3	3	2	4	1	2	2	2	3	2	2	1	2	2	1	2	3	2.3	**1**
19	2	2	4	2	4	4	5	4	1	2	3	3	4	2	3	2	2	4	2	2	2	1	4	1	2	2.7	**2**
20	4	4	1	4	4	2	3	2	4	2	2	2	3	4	3	2	4	1	4	4	4	5	1	4	4	3.1	**4**
21	2	2	2	4	4	2	2	3	4	4	3	4	4	4	2	4	4	3	4	4	4	4	2	4	4	3.3	**4**
22	2	3	2	2	3	4	4	1	2	3	3	2	2	2	4	2	3	4	2	2	2	1	4	2	2	2.5	**2**
23	2	2	2	2	2	2	4	3	4	2	2	2	2	2	3	2	2	3	2	2	2	1	3	2	2	2.3	**2**
24	2	2	2	2	3	2	4	3	2	2	2	2	2	2	3	2	2	2	2	2	2	1	3	2	2	2.2	**2**
25	2	1	2	3	2	2	1	2	4	3	2	2	2	4	5	2	3	2	2	1	2	4	1	2	3	2.4	**2**
26	4	2	4	2	4	4	3	4	3	3	4	4	4	2	4	3	2	3	4	3	3	1	5	2	3	3.2	**3**
27	3	2	4	2	4	3	5	3	2	2	4	5	2	2	3	4	2	3	3	3	4	1	5	1	4	3.0	**3**
28	2	3	3	3	3	2	3	2	2	2	3	2	2	2	4	2	3	3	2	4	2	1	3	2	5	2.6	**2**
29	2	2	3	2	4	2	3	4	2	2	3	3	2	2	2	3	2	3	2	2	2	1	5	1	2	2.4	**2**
30	2	2	4	2	5	3	5	2	2	3	4	4	2	2	4	2	3	4	2	2	2	1	5	4	3	3.0	**2**
AR	**2.3**	**2.2**	**3.1**	**2.1**	**3.3**	**2.6**	**3.4**	**2.9**	**2.8**	**2.4**	**3.0**	**3.0**	**2.6**	**2.2**	**3.2**	**2.5**	**2.1**	**2.7**	**2.3**	**2.6**	**2.6**	**1.6**	**3.9**	**2.1**	**2.7**	**2.6**	**2.3**

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 5.2b - BIPR Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information.** Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions.** Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders.**
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees.**
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 5.3 presents descriptive statistics of the BIPR survey responses. These statistics indicate agreement with outsourcing this function except with regard to factor 4, cost and cost-efficiency. The Between-Subjects Effects analysis in Table 5.4 shows that there is at least one statistically significant ($p<.001$) difference among factors, but no statistically significant ($p<.05$) difference among regions. The factors differed significantly in their suggestion to outsource or not; regions did not differ significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 5.5 and Table 5.6, factor 1 was significantly more favorable to outsourcing this function than factors 2, 3, 5, 6, which were, in turn, significantly more favorable to outsourcing than factor 4.

5.3 Qualitative Assessments: Selected Comments by Survey Respondents

The contractor's profit markup would rapidly make this item more expensive than in-house work.

Outsourcing is beneficial in performing activities for which the department is not equipped (ex-roadside mowing), and in supplementing department activities that exceed our production ability (ex-pavement markings).

Many maintenance activities are time sensitive. To delay a repair may impact the safety of the roadway facility. We are concerned about response times by the contractor if these time sensitive activities are outsourced.

There is plenty of Base Repair work to go around. Do not construe any of these answers to support total outsourcing. The district must maintain its capability to perform this function and outsource that amount of work we are unable to get with our own forces.

The outsourcing that was done in FY 1998 was a combination of base repair and overlay.

Refer to recent TTI study on outsourcing. It parallels this research project. Project 1730/1822 Optimum Resource Allocation.

These answers assume the district would retain their current FTE allocation.

We have not outsourced this function because it is significantly cheaper to perform in-house.

There would be no problems with outsourcing, we just choose to contract out other items of work that we feel is better to our district.

We are getting excellent results in outsourcing BIPR. Will contract 5-7 million $$s/ year.

A true answer to this would be dependent on how many other activities are outsourced. At some point FTE's would not be replaced.

Table 5.3 - Base-in-Place Repair Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	1.6667	.4714	5
1. External Mandates and Influences	Urban	1.8571	.5727	7
	Rural	2.0000	.7577	13
	Central Office	1.6667	n/a	1
	Total	1.8846	.6390	**26**
	Metro	2.6000	.9551	5
2. Strategic and Organization Effectiveness	Urban	2.8367	.5435	7
	Rural	2.3736	.7836	13
	Central Office	1.8571	n/a	1
	Total	2.5220	.7548	**26**
	Metro	2.6222	.5911	5
3. Organization Systems and Operations	Urban	2.9524	.5804	7
	Rural	2.4615	.7763	13
	Central Office	2.0000	n/a	1
	Total	2.6068	.6965	**26**
	Metro	3.5500	.5969	5
4. Cost and Cost-Efficiency	Urban	3.4643	.8219	7
	Rural	3.5769	.7865	13
	Central Office	4.2500	n/a	1
	Total	3.5673	.7333	**26**
	Metro	2.8500	.7416	5
5. Human Resources and Organization Culture	Urban	3.1786	.7029	7
	Rural	2.4808	.8131	13
	Central Office	2.0000	n/a	1
	Total	2.7212	.7979	**26**
	Metro	2.6667	.7071	5
6. Vendors	Urban	3.1905	.4241	7
	Rural	2.5897	.8295	13
	Central Office	2.3333	n/a	1
	Total	2.7564	.7276	**26**
	Metro	2.6593	.8441	30
All Factors	Urban	2.9133	.7789	42
	Rural	2.5804	.9064	78
	Central Office	2.3512	.9555	6
	Total	2.6764	.8691	**156**

Table 5.4 - Base-in-Place Repair Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable = extent of agreement/disagreement with Outsourcing

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	41.619	8	5.202	10.135	.000
Intercept	1117.433	1	1117.433	2176.858	.000
Factors	37.901	5	7.580	14.767	.000
Regions	3.718	3	1.239	2.414	.069
Error	75.459	147	.513		
Total	1234.510	156			
Corrected Total	117.078	155			

R Squared = .355 (Adjusted R Squared = .320)

Failed flexible base areas are usually small in size, and randomly occur over a large geographical area. Their occurrence is not a planned repair, but rather a reaction to a deterioration in the roadway. It would be very expensive to mobilize an out-of- town contractor to fix a small area when state forces are already in the area. Allowing a backlog of work sites before mobilizing the contractor would be a traffic safety hazard, as well as bad public relations.

Planning & scheduling this type of work especially 100% if outsourced would be difficult to plan and schedule especially if roadway suddenly goes to pieces because of heavy truck traffic because a new business or plant is starting up in the area, or long period of bad weather, or combination of both. If road starts failing and you can respond quickly, many times you can keep the road in a good, safe condition.

TxDOT, in this district has the resources and expertise to do this type of work cheaper and better than outsourcing because of TxDOT's ability to be mobile (has yard and equipment in area and employees), whereas contractor usually does not exist.

Outsourcing has proven cost-effective for those functions that require special skills or equipment which we do not have. Typically, we have found work performed in-house is superior to that outsourced, except where we lack special skills or equipment. Pride of ownership appears to be a key factor which TxDOT personnel possess, thereby providing a better product.

We counted out outsourcing BIPR several years ago. Contractors that get bids could not do this work. I know contractors can because of my experience with construction contractors. Due to the nature of base failures, I think this would be very expensive to contract out.

Table 5.5 - Base-in-Place Repair Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.6374	.1987	.017	-1.2036	-7.1092E-02
	3. Systems	-.7222	.1987	.004	-1.2885	-.1560
	4. Cost	-1.6827	.1987	.000	-2.2490	-1.1164
	5. HR	-.8365	.1987	.000	-1.4028	-.2703
	6. Vendors	-.8718	.1987	.000	-1.4381	-.3055
2. Strategic	1. Mandates	.6374	.1987	.017	7.109E-02	1.2036
	3. Systems	-8.4860E-02	.1987	.998	-.6511	.4814
	4. Cost	-1.0453	.1987	.000	-1.6116	-.4791
	5. HR	-.1992	.1987	.917	-.7654	.3671
	6. Vendors	-.2344	.1987	.847	-.8007	.3318
3. Systems	1. Mandates	.7222	.1987	.004	.1560	1.2885
	2. Strategic	8.486E-02	.1987	.998	-.4814	.6511
	4. Cost	-.9605	.1987	.000	-1.5267	-.3942
	5. HR	-.1143	.1987	.993	-.6806	.4520
	6. Vendors	-.1496	.1987	.975	-.7158	.4167
4. Cost	1. Mandates	1.6827	.1987	.000	1.1164	2.2490
	2. Strategic	1.0453	.1987	.000	.4791	1.6116
	3. Systems	.9605	.1987	.000	.3942	1.5267
	5. HR	.8462	.1987	.000	.2799	1.4124
	6. Vendors	.8109	.1987	.001	.2446	1.3772
5. HR	1. Mandates	.8365	.1987	.000	.2703	1.4028
	2. Strategic	.1992	.1987	.917	-.3671	.7654
	3. Systems	.1143	.1987	.993	-.4520	.6806
	4. Cost	-.8462	.1987	.000	-1.4124	-.2799
	6. Vendors	-3.5256E-02	.1987	1.000	-.6015	.5310
6. Vendors	1. Mandates	.8718	.1987	.000	.3055	1.4381
	2. Strategic	.2344	.1987	.847	-.3318	.8007
	3. Systems	.1496	.1987	.975	-.4167	.7158
	4. Cost	-.8109	.1987	.001	-1.3772	-.2446
	5. HR	3.526E-02	.1987	1.000	-.5310	.6015

Table 5.6 - Base-in-Place Repair Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	1.8846		
2. Strategic and Organizational Effectiveness	26		2.5220	
3. Organizational Systems and Operations	26		2.6068	
5. Human Resources and Organization Culture	26		2.7212	
6. Vendors	26		2.7564	
4. Cost and Cost-Efficiency	26			3.5673
Significance		1.000	.847	1.000

Often this is done by contract in conjunction with resurfacing projects (as part of the project).

If Base-in-Place repair needs outsourcing, a coordinator is required.

Any outsourcing will result in some loss of loyalty and faith.

I doubt if customers care who fixes the road, as long as it is fixed.

We have not outsourced any of this work.

Only if a second contract would be required after the outsourcing contract is completed.

Qualified contractors may not be able to perform the work when TxDOT needs it to be done.

No BIPR vendors located in the district.

Had we outsourced what MMIS indicates we performed in-house for FY98, it would have cost the state an additional $2 million. This function was outsourced only because we did not have sufficient personnel and equipment to perform all the work required.

Dollar savings unknown, but our district does not have adequate amount of equipment to perform all the BIPR needed for the district.

Due to the limited resources, this district could not maintain an acceptable level of service for

travelers and could potentially lose millions of dollars due to pavement weaknesses and deterioration if this function were 100% outsourced.

It is not the dollars -- cost is close to same. This is the only way we can accomplish the work load we have. Even this falls short of our needs.

We have calculated that outsourcing this function costs 88% more.

The cost to outsource most maintenance functions is more than to do them in-house. However, TxDOT is directed by the state legislature to outsource a percentage of its maintenance functions.

5.4 Actual and Potential Suppliers of this Function

The actual and potential Base-in-Place Repair vendors most frequently mentioned by the survey respondents include the following:

A.K. Gillis & Sons, Inc., Sulphur Springs
A.L. Helmcamp Construction Co., Buffalo
Ajax Equipment, Lufkin
Allied Paving Co., El Paso
APAC-Texas, Inc., Dallas
Austin Paving Company, Fort Worth
Bay LTD, Corpus Christi
Bick's Construction, Ft. Worth
Big Creek Construction Co., Calvert
Bo-Mac, Beaumont
Brannan Paving Co, Inc., Victoria
Capital Excavation, Austin
Capitol Excavation Co., Austin
Carey Construction Co. Inc., Austin
CCE, Inc., Nacogdoches
D.L. Lennon, Inc., Commerce
Dean Word Company, LTD, New Braunfels
Drewery Construction, Nacogdoches
Duininck Brothers Inc., Grapevine
E.E. Hood & Sons, Inc., Von Ormy
Forde Construction, Houston
Gilvin & Terrel Inc., Goodnight
Haas-Anderson, INC., Corpus Christi
Harold Stotts Earth Moving, Lubbock
Holmes Construction, Amarillo
Hunter Industries, Inc, San Marcos
Hunter Industries, Inc., Austin
Hunter Industries, San Marcos
Infrastructure Services, Houston
J. Lee Milligan, Amarillo
J.H. Strain & Sons
Jagoe – Public Co., Denton
Jones Finke
Jones Bros. Dirt & Paving
Kinsel Industries, Houston
Knight Construction
L.A. Fuller & Sons , Amarillo
Liska Construction Co, Inc., Karnes City
M. Hanna Construction, Sulphur Springs
Nobles Road Construction
Pinto Construction, Nacogdoches
Prater Construction Co.
Price Construction Co.
Recce – Albert Construction
Reynolds-Kay, Tyler
Sammy Gist Jr. Enterprises, Clarksville
SCR Construction Co. Inc., Richmond
Smith & Company, Conroe
Stripe-A-Zone, Lubbock
Traylor and Sons, Inc, Jacksonville
Williams Paving
Williams and Peters Construction, Lubbock
Wright's Excavating, Talco
Young Contractors, Waco

Young Bros' Zahn Paving, Lubbock
Zack Burkett Co., Graham

5.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Base-in-Place Repair (BPIR) Function

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Base-in-Place (BIPR) function based on a thorough analysis of data from all TxDOT districts, the Maintenance Division (central office), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Positive
Long-Term Effectiveness	Positive
Potential for further outsourcing at this time	High
Benchmarks (other states)	Favorable (more than other states)
Incentive to Outsource	Mandates
Direct Cost-Effectiveness	Negative
Systems/Operations Effects	Positive
Organizational Effectiveness Effects	Positive
Human Resources & Culture Effects	Positive Urban districts less favorable
Vendor-related Effects	Favorable Urban districts less favorable
District - Division Agreement	Yes
Recommendation	Increase emphasis on outsourcing this function

SECTION 6.0

SOURCING THE TXDOT PAINT-AND-BEAD STRIPING (PBS) FUNCTION

6.1 Introduction: Function Definition, Organization and Current Situation

Paint-and-Bead Striping (PBS) is defined as striping lane lines, center lines, edgelines and related areas using and beads, and is classified as maintenance codes (MC) 711 and 885. This function is similar to, but different than, thermoplastic striping, maintenance code 712. The two separate functions should not be confused. PBS also includes all make ready operations such as cleaning, spotting, etc. This function is performed in most of the 25 TxDOT districts, and is administered statewide by TxDOT's Maintenance Division (see Section 5.0 for a general description of the Maintenance Division).

Table 6.1 presents the expenditures of TxDOT on Paint-and-Bead Striping, by year, for 1994-1998. Spending for PBS has ranged from $14 M/year to about $25M/year during the period. PBS ranked approximately fourth in total expenditures of the Maintenance Division during this period, roughly equivalent to expenditures for Base-in-Place Repair, but well behind Leveling or Overlay (MC 212 - $50/year), Mowing (MC 511 - $35M/year), and Install/Reinstall Signs (MC 732 - $25M/year).

Statewide, approximately 30-50% of expenditures on PBS have been contracted out. The districts reported a range from 0-100% PBS outsourced, with the average being about 40%. Some districts reported no expenditure for this activity, but 100% (mostly outsourced) for Thermoplastic Striping.

6.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 6.2 presents the Paint-and-Bead Striping Outsourcing Survey Results by question number, district, and central office response. Table 6.2b is provided for interpretation survey responses.

In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor Related Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 6.1 - Paint-and-Bead Striping Total Expenditures, 1994 - 1998. (I = $ amount Insourced, O = $ amount Outsourced)

DIST	1998			1997			1996			1995			1994		
	Total	I	O	Total	I	O	Total	I	O	Total	I	O	Total	I	O
ABL	755644	755400	244	656876	656243	633	1329624	269305	1060319	2144391	893044	1251347	1700947	682179	1018768
AMA	818175	818175	0	684780	682582	2198	1311438	254372	1057066	1057113	1057113	0	1182264	1175089	7175
ATL	286338	276335	10003	358764	358764	0	1001016	524390	476626	501245	496949	4296	359205	355392	3813
AUS	149362	143652	5710	344635	100522	244113	1133916	879544	254372	942438	399651	542787	673343	378893	294450
BMT	0	0	0	0	0	0	363255	362634	621	8056	8056	0	247610	243254	4356
BRY	527588	497537	30051	483716	483716	0	1762611	1244000	518611	537609	537044	565	677731	550744	126987
BWD	798515	797401	1114	659981	659981	0	1064118	354078	710040	635288	635288	0	710283	702918	7365
CHS	348448	230896	117552	419649	189724	229925	423334	154029	269305	462361	337674	124687	490026	457385	32641
CRP	401857	401514	343	353106	353088	18	1059353	510070	549283	785719	785719	0	686355	679594	6761
DAL	315368	164121	151247	643933	192669	451264	781988	644561	137427	2418465	68626	2349839	2649623	234651	2414972
ELP	991394	255478	735916	394463	379788	14675	1216200	839530	376670	626099	283220	342879	684418	336185	348233
FTW	1668630	107909	1560721	1680448	122625	1557823	1350044	1057066	292978	1673257	636647	1036610	1472938	395798	1077140
HOU	2612	1528	1084	79502	70515	8987	403003	292978	110025	118249	22389	95860	135679	111050	24629
LBB	991781	991208	573	847439	737188	110251	880165	621	879544	1016108	1016108	0	1167707	1157392	10315
LFK	1026983	718089	308894	795175	453613	341562	933087	376670	556417	1004248	462047	542201	889907	659556	230351
LRD	325706	325706	0	359390	359390	0	793923	283853	510070	390718	234774	155944	409869	182893	226976
ODA	1069111	1069111	0	1455811	1165768	290043	1762611	518611	1244000	1196157	1196157	0	1383685	1044211	339474
PAR	1182197	738030	444167	481583	422245	59338	1704880	1060319	644561	1322816	782109	540707	900416	620630	279786
PHR	492507	455674	36833	493633	475180	18453	899563	375173	524390	631819	598453	33366	536974	505715	31259
SAT	170838	167112	3726	174009	173713	296	919051	556417	362634	1027543	237398	790145	1191155	392965	798190
SJT	395667	395667	0	422777	422777	0	1085213	710040	375173	659398	363823	295575	904528	532390	372138
TYL	1090260	100784	989476	444017	182386	261631	421280	137427	283853	827497	367145	460352	960019	345079	614940
WAC	459887	421879	38008	560702	526537	34165	903361	549283	354078	527688	527688	0	680771	661725	19046
WFS	679929	679754	175	717149	717149	0	1316156	476626	839530	698794	593722	105072	718810	429708	289102
YKM	45336	45336	0	532085	107896	424189	264054	110025	154029	1172184	123789	1048395	1213880	262413	951467
TOT	14996131	10558296	4435837	14045620	9994059	4049564	25085240	12541622	12541622	2238725	1266463	9720627	22630137	13097809	9530334

Table 6.2 - Paint-and-Bead Striping Outsourcing Survey Results by Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	3	4	2	2	4	1	3	2	2	2	3	4	3	5	5	3	4	2	2	3	4	1	5	2	2	2.9	**2**
2	4	5	2	2	4	1	3	5	2	3	3	5	3	5	4	4	4	3	2	3	4	2	5	3	5	3.4	**2**
3	1	2	2	2	3	1	1	2	1	1	2	2	2	2	2	2	2	1	1	2	2	1	3	1	1	1.7	**1**
4	1	2	1	1	2	1	1	2	1	1	2	2	2	2	2	2	2	1	2	2	2	1	4	1	1	1.6	**1**
5	1	2	1	1	2	1	1	2	3	2	2	2	2	2	3	2	2	2	2	2	3	1	4	1	1	1.9	**2**
6	3	5	2	2	4	1	3	2	3	2	3	4	2	4	4	2	4	3	2	2	4	2	4	4	5	3.0	**2**
7	2	2	3	2	3	1	1	2	2	2	2	3	2	4	4	3	3	2	2	2	3	1	4	1	2	2.3	**2**
8	2	4	2	2	3	1	3	5	2	2	2	3	2	3	3	2	4	3	2	2	2	1	4	1	2	2.5	**2**
9	4	3	3	2	4	1	3	3	4	3	3	4	2	5	4	3	4	3	2	2	2	1	5	2	2	3.0	**3**
10	2	4	4	2	2	1	1	3	2	2	2	5	2	4	3	3	3	1	3	4	3	1	5	1	2	2.6	**2**
11	2	2	2	3	4	5	5	4	4	5	5	4	4	4	4	4	3	2	1	4	2	4	1	5	5	3.5	**5**
12	2	4	4	2	5	1	5	5	3	2	3	5	2	5	3	2	4	2	1	3	4	1	5	2	4	3.2	**2**
13	2	2	5	2	5	1	5	4	2	2	3	5	2	5	5	3	3	3	3	4	4	1	5	2	4	3.3	**2**
14	2	4	4	2	3	1	5	5	3	2	3	4	2	5	4	4	3	3	2	2	4	1	5	4	4	3.2	**2**
15	3	2	3	2	4	1	3	3	2	2	2	4	2	4	3	3	3	3	2	2	4	1	5	1	2	2.6	**2**
16	3	5	4	3	5	1	5	2	4	2	3	5	5	5	4	4	4	3	4	4	5	2	5	4	3	3.8	**5**
17	2	2	2	2	4	1	5	3	2	2	2	5	2	4	4	3	3	2	3	2	3	2	5	2	5	2.9	**2**
18	3	2	3	3	1	5	5	2	2	3	2	2	2	2	1	2	2	3	2	2	1	2	1	2	3	2.3	**1**
19	2	3	2	2	1	1	3	4	3	2	2	2	2	5	3	4	4	3	2	2	3	1	4	1	3	2.6	**2**
20	4	4	4	4	4	1	5	1	1	2	4	1	4	1	1	5	3	2	4	1	2	4	1	4	1	2.7	**4**
21	3	2	4	4	4	4	5	1	3	4	3	3	4	2	2	2	2	3	4	4	4	4	2	4	4	3.2	**4**
22	2	4	4	2	5	2	5	4	4	3	4	4	2	3	2	2	4	2	2	3	3	2	4	2	2	3.0	**2**
23	2	3	2	2	1	1	3	2	2	2	2	2	2	3	2	2	3	2	2	2	2	1	3	2	2	2.1	**2**
24	2	2	2	2	2	1	5	2	3	2	2	2	2	3	3	2	2	2	2	2	2	1	3	1	2	2.2	**2**
25	3	2	2	3	5	5	1	3	1	3	2	1	4	1	2	2	2	3	2	2	1	2	1	2	3	2.3	**2**
26	4	3	2	2	2	2	3	4	5	2	3	3	4	4	4	3	3	3	4	3	2	2	5	1	3	3.0	**3**
27	4	2	3	3	4	1	3	4	2	3	2	3	2	5	4	4	4	3	3	3	4	1	5	4	3	3.2	**3**
28	2	3	2	3	3	1	4	2	2	3	2	2	3	3	3	2	3	3	2	3	3	2	3	2	3	2.6	**2**
29	2	4	2	2	5	1	5	3	2	2	2	5	2	3	2	3	2	2	2	2	3	1	5	2	5	2.8	**2**
30	2	5	4	2	4	2	5	5	2	2	3	2	3	5	4	2	3	2	2	4	2	1	5	4	3	3.1	**2**
AR	**2.5**	**3.1**	**2.7**	**2.3**	**3.4**	**1.6**	**3.5**	**3.0**	**2.5**	**2.3**	**2.6**	**3.3**	**2.6**	**3.6**	**3.1**	**2.8**	**3.1**	**2.4**	**2.3**	**2.6**	**2.9**	**1.6**	**3.9**	**2.3**	**2.9**	**2.8**	**2.3**

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 6.2b - PBS Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders.**
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees.**
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 6.3 presents descriptive statistics of the PBS survey responses. These statistics indicate agreement with outsourcing this function except with regard to Factor 4, Cost and Cost-Efficiency. The Between-Subjects Effects analysis in Table 6.4 shows that there is at least one statistically significant ($p<.001$) difference among Factors, but not statistically significant ($p<.05$) difference among regions. The Factors differed significantly in their suggestion to outsource or not; regions did not differ significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 6.5 and Table 6.6, Factor 1 was significantly more favorable to outsourcing this function than Factor 6, and Factors 5, 3, 2 and 6 were significantly more favorable to outsourcing than Factor 4.

6.3 Qualitative Assessments: Selected Comments by Survey Respondents

Central Maintenance Office estimates that outsourcing Paint-and-Bead Striping in FY 1998 resulted in approximately 68% higher per unit cost than insourcing it.

Have discussed with contractors the possibility of them contracting to do maintenance retracing and maintenance touch-up work. They will not bid it due to our location, unless we had several hundred thousand feet of stripes to place each time before they came up.

There should never be 100% outsourcing for striping. TxDOT must be able to perform small jobs (stripe patching work, etc.) and to respond when contractors cannot.

The district places very little paint-and-bead striping, but we outsource almost all of our thermoplastic. We believe outsourcing thermoplastic has been a great benefit to our district.

Paint-and-bead striping is generally used on low volume roads to replace markings covered by patching and small overlays. The striping work quantities are generally too small, and response time is too short, to allow for contracting to be feasible.

The district should continue to combine outsourcing and doing work in-house to meet the district's needs for center-striping.

At the present time, our district is attempting to stripe all US and SH highways with thermoplastic. All rehabilitation, new roadway, and contracted sealcoat projects include thermoplastic striping. The district has two paint-and-bead striping rigs, but limited FTE's to perform the function. If one FTE is on any type of leave, one striping rig is nonoperational; therefore, the district is attempting to limit their responsibility to the FM highway system.

Currently, our district has two striping crews (and machines worth around $460,000) that do most of the striping for our district. They are very responsive and can perform all duties necessary. I have reviewed this operation and feel that we could get about 60% of what we stripe in-house per year if we contracted this item.

Table 6.3 - Paint-and-Bead Striping Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	2.0667	.7601	5
1. External Mandates and Influences	Urban	2.3333	.5092	7
	Rural	2.1538	.7280	13
	Central Office	1.6667	n/a	1
	Total	2.1667	.6549	26
	Metro	2.8286	.7519	5
2. Strategic and Organization Effectiveness	Urban	2.5918	1.1262	7
	Rural	2.8901	.9425	13
	Central Office	1.8571	n/a	1
	Total	2.7582	.9335	26
	Metro	2.7556	.7089	5
3. Organization Systems and Operations	Urban	2.6984	.8951	7
	Rural	2.8291	.8160	13
	Central Office	2.0000	n/a	1
	Total	2.7479	.7867	26
	Metro	3.4500	.3260	5
4. Cost and Cost-Efficiency	Urban	3.1071	1.0394	7
	Rural	3.8654	.7189	13
	Central Office	4.2500	n/a	1
	Total	3.5962	.8065	26
	Metro	2.9500	.4472	5
5. Human Resources and Organization Culture	Urban	2.1786	.6879	7
	Rural	2.6923	1.0163	13
	Central Office	2.0000	n/a	1
	Total	2.5769	.8566	26
	Metro	2.2000	.2981	5
6. Vendors	Urban	3.1429	.6901	7
	Rural	2.8974	.9066	13
	Central Office	2.3333	n/a	1
	Total	2.8077	.8010	26
	Metro	2.7085	.7105	30
All Factors	Urban	2.6754	.8777	42
	Rural	2.8880	.9766	78
	Central Office	2.3512	.9555	6
	Total	2.7756	.9047	156

Table 6.4 - Paint-and-Bead Striping Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable = extent of agreement/disagreement with Outsourcing

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	30.852	8	3.856	5.905	.000
Intercept	1201.809	1	1201.809	1840.275	.000
Factors	28.228	5	5.646	8.645	.000
Regions	2.624	3	.875	1.339	.264
Error	96.000	147	.653		
Total	1328.660	156			
Corrected Total	126.851	155			

R Squared = .243 (Adjusted R Squared = .202)

Use of state forces ensures timeliness and flexibility, especially for striping patched areas. TxDOT is required to stripe such areas within 14 days. These locations are often small and widely spaced. To mobilize a contractor would be costly for such a small volume of work. This district outsources striping in conjunction with highway construction projects. The striper serves as a subcontractor and performs a fixed quantity of work as specified in the plans and specs.

The district maintains a striper and striping crew capable of striping with the waterborne paint to address emergencies, short or irregular areas, maintenance patches, etc. We outsource thermoplastic paint-and-bead striping to provide a more durable stripe on pavement surfaces that are to remain in place for several years. This combination provides a balance that allows us to address our striping needs both efficiently and cost-effectively.

We outsource 90% of our striping which is not paint and beads. We use thermo. The only striping we do with our crews is paint-and-bead striping for small maintenance patches.

Combination of outsourcing and insourcing must be maintained in order to meet the district's needs for center-striping.

Surface repair work by maintenance sections often must be followed by striping. Also, this work is often done as a part of resurfacing contracts.

We cannot meet our 14-day requirement for placing permanent striping since we have begun outsourcing.

Table 6.5 - Paint-and-Bead Striping Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.5916	.2241	.088	-1.2303	4.714E-02
	3. Systems	-.5812	.2241	.099	-1.2199	5.752E-02
	4. Cost	-1.4295	.2241	.000	-2.0682	-.7908
	5. HR	-.4103	.2241	.446	-1.0490	.2285
	6. Vendors	-.6410	.2241	.049	-1.2797	-2.3138E-03
2. Strategic	1. Mandates	.5916	.2241	.088	-4.7137E-02	1.2303
	3. Systems	1.038E-02	.2241	1.000	-.6283	.6491
	4. Cost	-.8379	.2241	.003	-1.4766	-.1992
	5. HR	.1813	.2241	.966	-.4574	.8200
	6. Vendors	-4.9451E-02	.2241	1.000	-.6882	.5893
3. Systems	1. Mandates	.5812	.2241	.099	-5.7515E-02	1.2199
	2. Strategic	-1.0379E-02	.2241	1.000	-.6491	.6283
	4. Cost	-.8483	.2241	.002	-1.4870	-.2096
	5. HR	.1709	.2241	.974	-.4678	.8097
	6. Vendors	-5.9829E-02	.2241	1.000	-.6985	.5789
4. Cost	1. Mandates	1.4295	.2241	.000	.7908	2.0682
	2. Strategic	.8379	.2241	.003	.1992	1.4766
	3. Systems	.8483	.2241	.002	.2096	1.4870
	5. HR	1.0192	.2241	.000	.3805	1.6579
	6. Vendors	.7885	.2241	.006	.1497	1.4272
5. HR	1. Mandates	.4103	.2241	.446	-.2285	1.0490
	2. Strategic	-.1813	.2241	.966	-.8200	.4574
	3. Systems	-.1709	.2241	.974	-.8097	.4678
	4. Cost	-1.0192	.2241	.000	-1.6579	-.3805
	6. Vendors	-.2308	.2241	.908	-.8695	.4079
6. Vendors	1. Mandates	.6410	.2241	.049	2.314E-03	1.2797
	2. Strategic	4.945E-02	.2241	1.000	-.5893	.6882
	3. Systems	5.983E-02	.2241	1.000	-.5789	.6985
	4. Cost	-.7885	.2241	.006	-1.4272	-.1497
	5. HR	.2308	.2241	.908	-.4079	.8695

Table 6.6 - Paint-and-Bead Striping Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	2.1667		
5. Human Resources and Organization Culture	26	2.5769	2.5769	
3. Organizational Systems and Operations	26	2.7479	2.7479	
2. Strategic and Organizational Effectiveness	26	2.7582	2.7582	
6. Vendors	26		2.8077	
4. Cost and Cost-Efficiency	26			3.5962
Significance				

Any outsourcing will result in some loss of loyalty and faith.

A true answer to this would be dependent on how many other activities are outsourced. At some point, FTE's would not be replaced.

We are already contracting this function and already have seen the impact-mostly negative and costly.

Outsourcing of this function did result in a slower response time.

Some contractors now providing this service do not place markings according to specs.

We are so far removed geographically from these contractors.

Costs about the same, we can do small jobs cheaper. Again, this frees up employees for other duties.

Qualified contractors may not be able to perform the work when TxDOT needs it to be done.

We have no PBS vendors in this district, but we get 5-6 bids for each contract.

Ours cost more from the contractors due to the distance they have to come.

All paint-and-bead striping is done by our special maintenance crews. All other pavement markings

are done under contracts for Thermoplastic Markings.

Some capability to perform this function with state forces must be maintained.

Outsource maintenance striping done to date in this district has been thermoplastic (function 712/886).

We have contracted 100% of function 886, thermoplastic striping. Overall, we contract out approximately 50% of paint-and-bead striping.

The assumption that there will be a savings if this function is outsourced may not be valid.

In 1996, it cost approximately 40-50% more to outsource.

We do know the price we get for the striping is very reasonable.

Since the cost of outsourcing is about the same as in-housing, there would be negligible savings.

If statewide outsourcing of this function becomes a reality, I anticipate a significant cost increase due to demand, the state's lack of equipment to perform the function in-house, and the lack of quality contractors for this function in the district area.

Since the necessity to contract this function is driven by available FTE's-not cost savings, we do not have sufficient data to provide an accurate estimate.

6.4 Actual and Potential Suppliers of this Function

The actual and potential Paint-and-Bead Striping vendors most frequently mentioned by the survey respondents include the following:

ACE Contractors, San Augustine
American Striping Co., Irving
ASC Pavement Markings, Irving TX
Barricades Unlimited, Lubbock
Batterson Inc, Houston
C&D Maintenance Inc., Jacksboro
Crabtree Barricades, Beaumont TX
D.I.J. Construction Inc., Bertram
DRS Construction Inc., Arthur City
Flasher Equipment Co., San Antonio TX
Highway Safety Service Co. Inc., Austin
Joe Valencik, Houston
Lectric Lites Co., Fort Worth
Linda's Construction Inc., Kingsville
Nite Lite Inc
Paige Barricades Inc., Baytown
Pavement Markings, Donna
Safety Lights, Houston TX
So. Texas Pressure Wash & Striping, Roma
Striping Systems Inc., McKinney
Striping Technology Inc., Tyler
Traffic Marking and Striping Co., Fargo, ND
Vela Enterprises, San Juan
Warning Lites of Texas Inc., Corpus Christi

6.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Paint-and-Bead Striping (PBS) Function

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Paint-and-Bead Striping (PBS) function based on a thorough analysis of data from all TxDOT districts, the Maintenance Division (central office), information from other state departments of transportation, vendor assessment, and an analysis of state and local economic conditions relative to this function.

Long-Term Impact	Positive
Long-Term Effectiveness	Positive
Potential for further outsourcing at this time	High
Benchmarks (other states)	Favorable (more than other states)
Incentive to Outsource	Mandates
Direct Cost-Effectiveness	Negative
Systems/Operations Effects	Positive
Organizational Effectiveness Effects	Positive
Human Resources & Culture Effects	Positive
Vendor-related Effects	Favorable Urban districts less favorable
District - Division Agreement	Yes
Recommendation	Increase emphasis on outsourcing this function

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SECTION 7.0

SOURCING THE TXDOT INFORMATION SYSTEMS/RESOURCES (ISR) FUNCTION

7.1 Introduction: Function Definition, Organization and Current Situation

The Information Systems Division (ISD) provides information resource services to support TxDOT's administrative and engineering business functions. The division manages and operates TxDOT's central computer, software and network facilities. ISD provides information systems and the technical expertise to support department personnel who use these systems. The division also manages one of the largest telecommunication systems in the state. Additionally it provides photogrammetry services in support of department design activities.

ISD supports the Registration and Titling System (RTS). RTS is an automated point-of-sale system used by county tax assessor collectors and their agents to register and title motor vehicles. The system serves more than 400 production offices across the state. This complex system contains approximately 125 microcomputer programs and 400 mainframe programs that are maintained by ISD technical staff. ISD replaced 2,227 obsolete workstations statewide with new workstations in 1998 and early 1999.

The ISD supports the statewide local area network (LAN). This statewide LAN contains over 400 servers with communications hardware to support approximately 8,500 users across the state including all TxDOT districts. GroupWise, TxDOT's statewide e-mail system is now available in all districts, area offices and Austin headquarters. One hundred ninety-one (191) e-mail post offices and 9,672 user mailboxes deliver over 100,000 e-mail messages daily.

ISD maintains TxDOT's website on the internet to provide current information to the general public. Over 7,000 documents are maintained on this website. Major areas include statewide highway condition reports, employment opportunities, letting and contractor information, statewide and local news releases and advisories regarding TxDOT activities. This website receives more than 3.4 million hits per month.

ISD is in the process of implementing the Geographic Information System (GIS) foundation across the department. This consists of implementing ArcView GIS software to access data from various transportation applications related to pavement and bridge functions. ArcView software will also serve as the platform upon which enterprise applications will be developed and implemented. ISD will provide training to TxDOT GIS users statewide led by a team of ISD and vendor instructors.

ISD currently has approximately 350 employees and has the following sections: Administrative Services; Business Systems Development & Support; Customer Support, Engineering and Survey Systems; Information Management; Resource Management and Procurement Services; Strategic Planning and Project Support; Technology Architecture Design and Implementation; and, Technology Infrastructure Management.

Table 7.1 is a summary of actual cost of outsourcing activities for the Information Systems Division for Fiscal Year 1998 (September 1, 1997 – August 31, 1998) and projected expenditures for Fiscal Year 1999 (September 1, 1998 – August 31, 1999). Although reduced costs may be a factor for outsourcing, recruiting and retaining qualified information resource professionals is a major reason for outsourcing some of the functions described in Table 7.1.

The Information Systems Division is currently outsourcing Disaster Recovery Operations activities with Sungard Recovery Services, Incorporated through an interagency agreement with the Texas Department of Information Resources (DIR). They are evaluating the potential for acquiring these services through DIR's West Texas Disaster Recover Operations Center (WTDROC) in San Angelo, Texas.

TxDOT is required to provide an analysis of alternatives, containing cost figures that evaluate the use of WTDROC before engaging in a contract with other sources. We have received a waiver from DIR in past years as the WTDROC facility was unable to meet our capacity requirements. The WTDROC continues to grow and future TxDOT evaluations may result in the use of the facility.

Additionally, the same legislation requires TxDOT to provide an analysis of cost alternatives that evaluate the use of the WTDROC before proceeding with mainframe upgrade purchases. TxDOT will utilize DIR's *Guidelines for Evaluating Internal and External Resources for Major Information Technology Projects* in its review of alternatives.

7.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 7.2 presents the Information Systems/Resources Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 7.2b is provided for interpretation survey responses.

In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor Related-Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 7.1 - Information Systems Division Percent of FTE's Outsourced by Function, 1998 and 1999

Activity	ACTUAL AMOUNT BILLED TO DATE FY98	Average No. of Persons FY98	Average Rate FY98	Percent of FTE's Outsourced by Function	CONTRACT AMOUNT FY99	Average No. of Persons FY99	Average Rate FY99	Percent of FTE's Outsourced by Function
Y2K Project Management	241,752.45	1	129.00	33%	142,147.55	1	66.63	33%
Technical Support	101,116.93	2	28.53	13%	108,804.07	2	29.34	13%
Technical Support	118,505.00	1	64.50	17%				
Technical Support	99,967.60	1	50.90	20%	52,951.40	1	51.20	20%
Technical Support	3,987.50	1	55.00	< 1%				
Technical Support	119,544.00	1	102.00	7%				
Y2K Programming Support	1,239,628.63	11	55.14	50%	2,694,027.37	13	58.27	50%
Y2K Programming Support	348,271.25	4	48.50	18%	309,000.00	3	58.00	18%
Database Programmer Analyst	304,920.66	3	55.50	38%	378,697.34	3	60.31	38%
Application Programming Support	1,080,008.50	8	70.38	57%	1,309,591.50	7	79.07	50%
Application Programming Support	304,714.50	3	56.33	25%				
Application Programming Support	298,255.20	4	60.20	50%	601,744.80	5	58.84	58%
Programmer Analyst	83,215.95	1	46.60	33%	50,500.05	1	47.92	14%
Programmer Analyst	93,938.00	1	52.00	100%	138,642.00	1	66.63	100%
Data Analyst					97,380.00	1	97.38	17%
Application Programmer Analyst	12,740.50	1	83.00	< 1%	20,459.50	1	90.20	< 1%
GIS Technical Analyst(s)	48,380.00	4	114.00	5%				
GIS Technical Analyst(s)					212,663.00	3	121.98	17%
Disaster Recovery Services	307,114.00			100%				
Disaster Recovery Services					380,950.00			100%
Computer Operators	78,811.88	2	28.13	12%				
Computer Operators					130,000.00	2	35.42	12%
Aerial Photography	306,171.15			100%	989,103.36			100%
TOTALS	**5,191,043.70**				**7,616,661.94**			

Table 7.2 - Information Systems/Resources Outsourcing Survey Results by Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	Co
1	3	5	4	3	5	5	5	5	5	3	5	4	4	5	5	5	4	2	3	3	5	4	5	2	5	4.2	2
2	5	5	5	5	5	5	5	5	5	4	5	4	4	4	5	5	4	2	4	4	5	4	5	2	5	4.4	4
3	3	5	4	2	4	4	5	5	5	4	5	5	4	2	5	5	4	3	4	2	5	4	5	4	3	4.0	3
4	3	3	3	1	4	3	3	3	3	3	3	2	3	2	3	4	3	3	3	2	3	3	3	3	3	2.9	2
5	4	3	3	4	5	3	3	4	2	2	2	2	2	2	3	4	2	2	2	2	5	2	3	2	3	2.8	4
6	5	5	5	1	5	4	4	4	4	3	5	4	4	4	5	5	4	3	4	3	5	4	5	4	4	4.1	4
7	5	4	5	2	5	3	4	3	4	3	4	4	3	4	5	2	3	2	3	2	5	3	5	2	5	3.6	4
8	4	5	5	2	4	5	4	3	3	2	5	3	4	3	5	4	3	2	4	2	5	3	5	2	4	3.6	4
9	5	4	5	3	5	5	5	4	4	3	4	4	3	5	5	4	4	3	2	2	5	2	5	2	5	3.9	4
10	5	3	3	3	5	3	4	3	3	2	4	2	2	4	3	3	2	2	2	2	5	2	3	2	2	3.0	3
11	2	3	2	1	2	3	2	5	1	5	4	4	2	4	2	2	2	1	2	3	1	4	1	4	5	2.7	1
12	5	5	5	1	5	4	5	5	4	4	5	5	4	4	5	5	4	3	4	4	4	4	5	2	5	4.2	4
13	5	5	5	3	5	4	5	4	4	4	5	5	4	3	5	3	4	3	4	2	5	4	5	3	5	4.2	5
14	5	4	5	1	5	5	5	4	4	4	5	3	2	4	5	5	4	4	4	4	5	4	5	2	4	4.1	4
15	5	5	3	4	3	4	5	3	4	3	2	3	3	4	5	5	4	4	3	2	5	3	5	2	4	3.7	3
16	5	5	5	5	5	3	5	5	5	4	4	5	5	5	5	5	4	3	4	3	5	4	5	4	5	4.5	5
17	5	5	3	1	5	3	4	4	5	2	5	1	5	4	3	2	3	3	2	2	5	4	5	2	3	3.4	3
18	1	1	1	1	1	2	3	1	5	3	1	1	2	1	5	5	1	3	2	3	1	3	1	3	1	2.1	2
19	2	2	3	1	2	2	4	2	3	2	2	2	2	1	3	2	2	2	2	3	4	2	3	2	2	2.3	2
20	2	4	3	5	2	2	2	4	1	2	3	2	2	3	2	1	2	3	3	2	2	3	1	3	1	2.4	3
21	1	1	1	3	3	2	2	2	4	2	2	2	2	2	3	1	2	3	3	2	2	2	1	3	2	2.1	4
22	3	4	3	3	4	4	4	4	3	4	1	3	3	4	4	4	3	3	4	2	5	3	3	2	3	3.3	4
23	4	5	3	5	5	5	4	4	4	3	4	4	3	4	4	4	4	4	4	2	5	4	3	2	3	3.8	4
24	3	4	5	1	3	3	4	4	4	3	3	3	2	2	4	5	3	3	4	2	3	3	3	2	3	3.2	4
25	1	1	1	1	1	4	1	1	1	2	1	2	1	1	2	1	2	3	2	2	1	3	1	2	1	1.6	2
26	5	4	3	1	5	4	4	4	4	3	4	3	4	2	4	2	4	3	4	4	3	3	3	4	3	3.5	5
27	3	5	4	1	5	4	4	3	5	4	5	4	4	4	5	5	4	2	3	2	5	4	5	4	4	3.9	3
28	4	4	5	1	4	3	4	3	4	4	5	4	3	5	5	5	4	3	3	3	5	4	5	2	3	3.8	2
29	4	5	3	3	5	5	5	3	5	3	5	3	4	5	4	4	5	3	3	2	5	4	5	2	4	4.0	4
30	5	4	5	1	5	5	4	5	4	4	5	4	4	5	4	3	4	4	4	4	5	4	5	4	5	4.2	4
AR	3.7	3.9	3.7	2.3	4.1	3.7	3.9	3.6	3.7	3.1	3.8	3.2	3.1	3.4	4.1	3.7	3.3	2.8	3.2	2.6	4.1	3.3	3.8	2.6	3.5	3.5	3.4

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 7.2b - ISR Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders.**
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees.**
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 7.3 presents descriptive statistics of the IS/R survey responses. These statistics indicate a strong agreement with insourcing this function. The Between-Subjects Effects analysis in Table 7.4 shows that there is at least one statistically significant ($p<.001$) difference among factors, but no statistically significant ($p<.05$) difference among regions. The factors differed significantly in their suggestion to outsource or not; regions did not differ significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 7.5 and Table 7.6, factor 4 was significantly more favorable to insourcing than factors 2, 3, 5 and 6, while factors 2, 3 and 5 were more favorable to insourcing than was factor 1.

7.3 Qualitative Assessments: Selected Comments by Survey Respondents

By outsourcing completely the information systems/resources of TxDOT, the agency will lose both flexibility and adequate control of critical core function automated systems involved in the design, construction and maintenance of the transportation systems. Based upon past expenses, it is not possible to write contracts that include every aspect of information systems/resources technical support. Consequently, unforeseen work tasks that are not identified in technical support outsourced contracts pose problems of adequately addressing these issues when they arise. Additionally, contracting information systems/resources has proven to be more expensive for the district than in-house expertise. However, we have been forced to contract specific high level technical expertise due to a highly competitive job market.

We have had many problems getting our computers repaired using the statewide service contract. Service is slow, and when subcontracted to local vendors, service is poor and has to be redone. Downtime is a factor we must consider most when we contract IR services. None of our local vendors are knowledgeable on our mainframe applications.

Our personnel involved in this area are far less paid than private industry personnel. I do not believe that by contracting this function out, the department will have any significant cost savings. I also believe you will have many frustrated employees, because the service with contracting out will go way down. Most people today still want to talk to someone when they have a problem – not talk to an automated system. I think that is what we would eventually move to if outsourced. The IBM mainframe support and engineering support should stay in-house because it is too specialized. The Lan-Wan and office support (Novell, Groupwise, Word, Excel, and other common software) could be outsourced with strong supervision (because of the information they would have access to) and depending on the quality of personnel, possibly more efficiently.

TxDOT has multiple in-house applications and infrastructure design issues that would make outsourcing of this function extremely difficult. The outsourcing is extremely expensive at this period of time and it would be difficult to accomplish the outsourcing at the current budget levels.

IS cannot be outsourced and provide the same levels of service as can be provided in-house.

Table 7.3 - Information Systems/Resources Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	3.3333	.6236	5
1. External Mandates and Influences	Urban	2.9048	.5998	7
	Rural	2.9487	.6360	13
	Central Office	3.3333	n/a	1
	Total	3.0256	.6105	26
	Metro	4.1143	.8043	5
2. Strategic and Organization Effectiveness	Urban	4.1429	.6494	7
	Rural	3.6484	.8136	13
	Central Office	3.4286	n/a	1
	Total	3.8626	.7672	26
	Metro	3.8444	1.1616	5
3. Organization Systems and Operations	Urban	3.8730	.3977	7
	Rural	3.7265	.6045	13
	Central Office	3.3333	n/a	1
	Total	3.7735	.6648	26
	Metro	4.6500	.4183	5
4. Cost and Cost-Efficiency	Urban	4.1429	.5175	7
	Rural	4.0577	.7300	13
	Central Office	4.0000	n/a	1
	Total	4.1923	.6337	26
	Metro	4.1500	.4541	5
5. Human Resources and Organization Culture	Urban	3.4286	.7599	7
	Rural	3.5577	.9744	13
	Central Office	4.0000	n/a	1
	Total	3.6538	.8369	26
	Metro	3.2000	1.2605	5
6. Vendors	Urban	3.6190	.4050	7
	Rural	3.3846	.4684	13
	Central Office	4.0000	n/a	1
	Total	3.4359	.6584	26
	Metro	3.8820	.9254	30
All Factors	Urban	3.6852	.6919	42
	Rural	3.5539	.7775	78
	Central Office	3.6825	.3495	6
	Total	3.6573	.7788	156

Table 7.4 - Information Systems/Resources Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	22.923	8	2.865	5.926	.000
Intercept	2086.638	1	2086.638	4315.390	.000
Factors	20.538	5	4.108	8.495	.000
Regions	2.385	3	.795	1.644	.182
Error	71.080	147	.484		
Total	2180.640	156			
Corrected Total	94.002	155			

R Squared = .244 (Adjusted R Squared = .203)

Outsourcing always looks good on paper, but the reality is, that the state will pay more, and get less for the money.

The entire IS function should never be outsourced completely. Management and the central core infrastructure of the IS section should be TxDOT employees (i.e., contract management, planning, budget, tech/direction, supervisory skills, purchasing, inventory, etc.). The salary issue must be addressed. It is difficult to have a TxDOT employee work side-by-side with a contractor who makes twice as much as they do.

This function handles many sensitive information systems. Personnel data on employees, bio information on contracts with the state. Downtime of systems would increase due to no technician onsite. Customer service would decrease due to personal relationships being broken.

The level of service currently provided by in-house information staff could not be maintained if the function is outsourced due to the diversity of the tasks performed. Because information resources is a core function of the district and downtime results in the loss of productivity for all functions and loss of service to taxpayers (vehicle titles & registration and county tax assessors), response time is critical to operations. Outsourcing this function has the potential to impact response time.

TxDOT business knowledge must continue to be cultivated and retained internal to the agency. Contractor resources fulfill TxDOT needs for additional manpower; however, the business knowledge required to support the application systems for core TxDOT functions must be retained by TxDOT personnel. This agency cannot afford to be in a position where contractor staff retain all the business knowledge for an application that is critical to TxDOT operations.

Table 7.5 - Information Systems and Resources Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.8370	.1929	.000	-1.3866	-.2874
	3. Systems	-.7479	.1929	.001	-1.2975	-.1983
	4. Cost	-1.1667	.1929	.000	-1.7163	-.6171
	5. HR	-.6282	.1929	.014	-1.1778	-7.8611E-02
	6. Vendors	-.4103	.1929	.273	-.9599	.1393
2. Strategic	1. Mandates	.8370	.1929	.000	.2874	1.3866
	3. Systems	8.913E-02	.1929	.997	-.4605	.6387
	4. Cost	-.3297	.1929	.525	-.8793	.2199
	5. HR	.2088	.1929	.889	-.3408	.7584
	6. Vendors	.4267	.1929	.232	-.1229	.9763
3. Systems	1. Mandates	.7479	.1929	.001	.1983	1.2975
	2. Strategic	-8.9133E-02	.1929	.997	-.6387	.4605
	4. Cost	-.4188	.1929	.251	-.9684	.1308
	5. HR	.1197	.1929	.990	-.4299	.6693
	6. Vendors	.3376	.1929	.498	-.2120	.8872
4. Cost	1. Mandates	1.1667	.1929	.000	.6171	1.7163
	2. Strategic	.3297	.1929	.525	-.2199	.8793
	3. Systems	.4188	.1929	.251	-.1308	.9684
	5. HR	.5385	.1929	.059	-1.1133E-02	1.0881
	6. Vendors	.7564	.1929	.001	.2068	1.3060
5. HR	1. Mandates	.6282	.1929	.014	7.861E-02	1.1778
	2. Strategic	-.2088	.1929	.889	-.7584	.3408
	3. Systems	-.1197	.1929	.990	-.6693	.4299
	4. Cost	-.5385	.1929	.059	-1.0881	1.113E-02
	6. Vendors	.2179	.1929	.869	-.3316	.7675
6. Vendors	1. Mandates	.4103	.1929	.273	-.1393	.9599
	2. Strategic	-.4267	.1929	.232	-.9763	.1229
	3. Systems	-.3376	.1929	.498	-.8872	.2120
	4. Cost	-.7564	.1929	.001	-1.3060	-.2068
	5. HR	-.2179	.1929	.869	-.7675	.3316

Table 7.6 - Information Systems/Resources Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	3.0256		
6. Vendors	26	3.4359	3.4359	
5. Human Resources and Organization Culture	26		3.6538	3.6538
3. Organizational Systems and Operations	26		3.7735	3.7735
2. Strategic and Organizational Effectiveness	26		3.8626	3.8626
4. Cost and Cost-Efficiency	26			4.1923
Significance		.273	.232	.059

There are mainframe system's applications and engineering systems/applications that can't readily be found in the private sector without paying a premium price. To give up such a critical area of the district operation and potentially lose the knowledge layer that represents decades of learning would be a grave mistake. If our employees were paid for the overtime they expend, in addition to the markedly increased wages that their counterparts in the private sector earn, the cost to the state would more than double. In the private sector, companies are subject to economic turns, which can potentially place their existence in jeopardy. Within TxDOT, there is a sense of employee loyalty and pride that is not naturally found in the private sector, with the merging of business/corporations, and resulting downsizing/rightsizing, etc. that they are constantly undergoing.

There is a lack of local service providers. The network administration and software support are continuous processes and in our case more economically handled by TxDOT FTEs.

The market and availability for tech support is critical and may result in overall increases in costs. Consideration for outsourcing some specific areas would appear to make other improvements and could result in reductions for in-house functions.

In our rural environment, computer support vendor services are very limited. A small district like ___ has very low employee turnover, so our employee's needs for training and one-on-one support are much less than urban districts. We currently support over 150 users with only 3 support personnel. A major concern with outsourcing is the vendor's likely "here today, gone tomorrow" attitude. Information resources must be managed with long-term perspectives. Multiple vendors will look at their contract.

There are zero cost savings. Outsourcing is functions. Full time employees are continuously leaving for higher paying jobs. With the current economy, few qualified individuals apply.

Outsourcing is required to maintain support service levels to district personnel. TxDOT continues to experience turnover with its information technology professionals. Employees are leaving for more money as offers from the private sector continue to yield salary increases in the 15%-20% range. As a state agency, we are limited on what we can do regarding salary and benefits. Our strategy to address reduced staffing is to focus TxDOT staff with invaluable business knowledge on our core competencies and outsource the more routine functions. Staffing for our core competencies has become increasingly more difficult as employees with business and technical knowledge continue to leave for more lucrative salaries.

Outsourcing is utilized to address the shortage of information resource professionals in state government; however, it should not be considered a panacea for solving this shortage. Turnover in critical applications and technical support areas has resulted in our reliance on contractors to serve lead roles due to their assimilation of business knowledge while serving lessor support roles on projects. This situation places TxDOT in an extremely vulnerable position, as the agency can be held hostage by contractor staff in the area of salary compensation. These individuals possess high level TxDOT business knowledge, and are aware of the advantage of their position. Bidding wars between vendors to acquire these individuals are quite common. This is further compounded by the competitive environment that also exists in the vendor community as vendors compete for contract programmers to gain contracts with TxDOT and other state agencies.

DIR recently published their Guidelines for Evaluating Internal and External Resources for Major Information Technology Projects. This publication is available through the DIR web site at http://www.dir.state.tx.us/oversight/lvp/.

7.4 Actual and Potential Suppliers of this Function

The actual and potential list of Information System (IS) vendors would include all on the Qualified Information System Vendors (QISV) list approved by the General Services Division. The most frequently mentioned IS vendors by the survey respondents include the following:

A-B-S Advanced Business Solutions, Lufkin
A-Plus Computer Services, Inc., Bryan
ACSI
Adosea Technologies Corp., College Station
Ajilon Services, Inc., Austin
Al-Razaq Computing Services, Houston
Application Group Inc., Lufkin
Applied Computing Services, Inc., Bryan
Blinn College
Brownwood Computer Innovation, Brownwood
CalTech
Computer Depot Business Center, Odessa
Compuview Microsystems, Bryan
D.C. Beard & Assoc., Corpus Christi
Department of Information Resources
Global Knowledge Group, College Station
Knight Enterprises
M-Tech Computer Serv., Corpus Christi
Metro Information Services, Austin
MicroAge

Permian Micro-Mart, Odessa
Power Systems Computers
RHI Consulting, Austin
SaberData
Tech-Net Info. Systems, Corpus Christi
Technical Solutions, Amarillo
Technology Management Services, Lufkin
TEEX
Texas A&M University
Texas Computers, College Station
TexPro Computer, Inc., Corpus Christi
Triad Office Solutions, Nacogdoches
Valcom Computer Center, Odessa

7.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Information Systems/Resources (IS/R) Function

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Information Systems/Resources (IS/R) function based on a thorough analysis of data from all TxDOT districts, the IS/R Division (central office), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Marginal to negative
Long-Term Effectiveness	Negative to marginal
Potential for further outsourcing at this time	Low to marginal Selective outsourcing higher
Benchmarks (other states)	Marginal (about the same as other states)
Incentive to Outsource	Expertise, technical skills
Direct Cost-Effectiveness	Negative Selective outsourcing positive
Systems/Operations Effects	Negative
Organizational Effectiveness Effects	Negative
Human Resources & Culture Effects	Positive
Vendor-related Effects	Unfavorable to neutral

District - Division Agreement	Yes
Recommendation	Selectively outsource needed skills.

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SECTION 8.0

SOURCING THE TXDOT FACILITIES MANAGEMENT AND MAINTENANCE (FMM) FUNCTION

8.1 Introduction: Function Definition, Organization and Current Situation

Facility Management and Maintenance (FMM) includes such diverse activities as HVAC maintenance and new installation, electrical, boiler maintenance, chiller maintenance, filter change out, plumbing maintenance and new install, painting, elevator maintenance, electrical new install and maintenance, grease and sludge trap removal, fire extinguisher inspection, fire alarm maintenance, halon fire suppression maintenance, rotary uninterruptible power supply maintenance, grounds, housekeeping, security and security guards, certain carpentry, conference room scheduling, taxi service, energy management and control system maintenance, project inspection and administration, and other related functions necessary to maintain TxDOT facilities and assure ongoing TxDOT operations.

Facilities Management and Maintenance is performed to some extent in each TxDOT district. Statewide, FMM is administered by TxDOT's General Services Division (GSD). GSD is the central purchasing office for TxDOT, operating with one of the largest purchasing staffs in the state. GSD also oversees the management of TxDOT's personal property, including the equipment fleet, the disposal of surplus property, and the preventive maintenance and alternative fuels programs. The division manages the Austin headquarters facilities, providing security, housekeeping and maintenance services. GSD's general shop's operation issues and maintains the Austin headquarters shuttle vehicles and constructs and modifies major equipment for the districts as needed. Other department-wide programs and support services include the TxDOT Print Shop, electronic publishing center, engineering plans copying and letting support, online manuals program, records management program, and recycling and recycled products program.

Outsourcing FMM functions varies by function and by district, but is generally estimated as follows:

Grounds	95% of expenditures outsourced
Maintenance	50% of expenditures outsourced
Housekeeping	85% of expenditures outsourced
Security	50% of expenditures outsourced

8.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 8.1 presents the Facilities Management and Maintenance Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 8.1b is provided for interpretation survey responses.

Table 8.1 - Facilities Management and Maintenance Outsourcing Survey Results by Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	5	3	2	2	3	3	5	2	5	2	2	2	4	4	3	2	4	1	2	2	4	2	5	2	3	2.9	3
2	4	3	4	2	3	2	5	1	4	2	2	2	4	4	3	2	3	1	2	2	4	2	5	2	2	2.8	4
3	3	2	2	2	3	1	2	1	1	2	2	1	2	2	2	2	2	1	1	2	3	3	3	1	2	2.0	4
4	2	3	2	1	3	3	4	1	1	4	3	3	2	2	2	2	2	1	2	2	3	2	4	1	2	2.1	3
5	2	3	2	2	3	2	4	3	1	2	2	2	2	2	2	2	2	1	2	2	3	2	4	1	2	2.1	3
6	5	4	2	2	3	3	2	1	4	2	2	2	4	4	4	2	3	3	2	2	4	2	4	2	2	2.9	5
7	5	3	2	2	3	3	3	1	4	1	2	2	4	3	4	2	2	2	2	2	4	2	4	1	2	2.6	3
8	4	3	2	2	3	2	3	2	3	3	2	2	4	2	4	2	2	2	2	2	4	2	4	2	2	2.6	5
9	5	3	2	3	3	3	4	3	4	2	2	2	4	4	4	2	2	2	2	2	4	2	5	2	2	2.8	5
10	4	3	2	2	3	3	3	1	3	2	2	3	4	2	3	2	3	2	3	2	3	2	1	2	2	2.4	4
11	2	4	4	3	3	3	4	4	4	5	5	2	2	4	4	2	3	2	3	4	1	4	5	4	5	3.3	4
12	4	2	2	2	3	3	5	2	4	3	2	2	4	2	2	2	4	2	1	4	4	2	5	5	1	2.9	4
13	5	2	2	2	3	4	5	4	2	2	2	2	4	2	3	2	4	2	3	4	4	2	5	4	2	3.2	5
14	5	2	2	2	3	4	4	1	3	2	2	3	4	4	4	2	4	2	2	2	4	2	5	4	2	3.2	4
15	5	2	2	3	3	4	5	1	3	3	2	2	4	2	2	2	4	2	2	2	4	2	5	4	2	2.8	4
16	4	4	4	3	3	5	5	5	3	3	4	4	5	4	4	3	4	3	4	4	4	2	5	4	4	3.8	5
17	4	2	2	2	3	4	5	2	4	2	2	2	5	3	3	2	3	3	3	2	4	2	5	4	2	3.2	5
18	1	2	2	3	3	1	1	1	3	3	2	2	1	2	3	3	2	3	2	2	2	4	1	2	2	2.2	1
19	2	2	2	2	3	4	3	2	1	2	2	2	3	4	2	2	3	3	2	3	3	2	4	2	1	2.6	3
20	3	3	4	3	3	4	1	3	5	2	3	5	2	4	1	3	2	3	4	4	2	4	1	4	2	2.8	2
21	1	2	4	3	3	1	1	2	4	3	4	4	3	2	2	2	3	3	4	4	2	4	2	2	4	2.8	1
22	5	3	2	2	3	4	4	1	2	3	2	2	3	4	4	3	3	2	2	2	3	2	4	2	4	2.9	4
23	2	2	2	2	3	2	3	1	4	2	2	2	3	3	4	2	4	3	2	3	4	2	3	4	3	3.1	3
24	4	3	2	2	3	2	4	1	2	3	2	2	2	4	4	3	4	3	2	2	4	2	3	4	2	3.0	4
25	1	2	2	3	3	1	1	1	2	3	2	2	2	2	2	2	2	3	2	2	2	3	1	2	2	2.1	2
26	4	3	4	2	3	3	5	4	3	3	3	2	4	4	4	3	3	3	4	3	3	4	5	2	2	3.4	3
27	3	2	2	2	3	2	4	3	2	2	2	2	4	3	3	2	3	2	2	3	4	2	5	2	2	2.8	5
28	3	4	2	2	3	4	3	4	2	2	2	2	4	4	4	2	3	2	2	2	4	4	3	4	2	3.1	4
29	4	2	2	2	3	2	5	2	2	1	2	2	4	4	2	2	3	2	2	2	4	2	5	2	2	2.8	5
30	5	5	3	2	3	5	5	3	4	2	2	2	4	4	4	2	3	2	2	2	4	4	5	4	2	3.2	3
AR	3.5	2.8	2.4	2.2	3.0	2.9	3.6	2.1	3.0	2.4	2.3	2.3	3.4	3.1	3.1	2.2	3.0	2.2	2.3	2.5	3.4	2.5	3.9	2.7	2.3	2.8	3.7

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 8.1b - FMM Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
- Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders**.
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees**.
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor Related-Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 8.2 presents descriptive statistics of the FMM survey responses. The Between-Subjects Effects shown in Table 8.3 indicates at least one statistically significant ($p<.001$) difference among factors. In addition, there was also at least one statistically significant ($p<.05$) difference among regions. Factors, as well as regions, differed significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 8.4, Table 8.5, Table 8.6 and Table 8.7, factors 1, 2, 3, 5, 6, were found to be significantly more favorable to outsourcing than factor 4. Further multiple comparison post hoc analysis between regions indicated that the districts and the FMM central office (GSD) differed significantly in their views toward outsourcing as indicated in Table 8.7. These data indicate that the districts were significantly more favorable toward outsourcing than was the FFM central office.

8.3 Qualitative Assessments: Selected Comments by Survey Respondents

Any outsourcing will result in some loss of loyalty and faith. Generally, we do not think that outsourcing FMM results (or would result) in human resources problems.

Any communication regarding outsourcing is demoralizing for employees and adversely affects loyalty and faith in an organization. Outsourcing promotes employees to question whether decisions are based on politics and not on an objective analysis of cost-effectiveness and benefit to TxDOT.

As with any organization, public or private, proprietary information is best managed and contained by limiting exposure.

Contracting building repairs requires the contractor to obtain insurance. Very few firms are unwilling to do so, especially in small towns, when the expected volume of work is small. Also, most repairs are of the type that require quick action. The process for obtaining a qualified contractor is slow and, as a result, greater damage to the facility if repairs are not made timely.

Table 8.2 - Facilities Management and Maintenance Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	2.5333	.6498	5
1. External Mandates and Influences	Urban	2.5238	.8997	7
	Rural	2.3590	.7000	13
	Central Office	3.3333	n/a	1
	Total	2.4744	.7313	26
	Metro	2.7714	.8488	5
2. Strategic and Organization Effectiveness	Urban	2.5306	.8949	7
	Rural	2.7363	.7756	13
	Central Office	4.2857	n/a	1
	Total	2.7473	.8392	26
	Metro	2.8444	.7520	5
3. Organization Systems and Operations	Urban	2.6984	.7019	7
	Rural	2.9744	.7753	13
	Central Office	4.0000	n/a	1
	Total	2.9145	.7485	26
	Metro	3.4000	.5755	5
4. Cost and Cost-Efficiency	Urban	3.7500	.7638	7
	Rural	3.5962	.7037	13
	Central Office	4.7500	n/a	1
	Total	3.6442	.7042	26
	Metro	3.0000	1.0458	5
5. Human Resources and Organization Culture	Urban	2.5357	.7962	7
	Rural	2.7500	.7971	13
	Central Office	3.5000	n/a	1
	Total	2.7692	.8244	26
	Metro	2.9333	.4944	5
6. Vendors	Urban	2.7619	.9947	7
	Rural	3.2051	.6460	13
	Central Office	3.6667	n/a	1
	Total	3.0513	.7284	26
	Metro	2.9138	.7330	30
All Factors	Urban	2.8001	.9078	42
	Rural	2.9368	.8123	78
	Central Office	3.9226	.5317	6
	Total	2.9335	.8356	156

Table 8.3 - Facilities Management and Maintenance Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	27.219	8	3.402	6.174	.000
Intercept	1342.428	1	1342.428	2436.097	.000
Factors	20.588	5	4.118	7.472	.000
Regions	6.630	3	2.210	4.011	.009
Error	81.005	147	.551		
Total	1450.652	156			
Corrected Total	108.224	155			

R Squared = .252 (Adjusted R Squared = .211)

Currently, building operations distributes work through 20+ service contracts with the private sector. A private maintenance company may not create the opportunity for new vendors to be awarded certain functions of the maintenance contract such as fire alarm, elevators, etc. Subcontractors would have to have an "in" with the maintenance company. A private maintenance company may minimize opportunities for subcontractors by creating their own maintenance teams.

Currently we perform some building maintenance in house and yet contract (using BMA's) to get a significant amount of work done. I do not believe we can completely outsource all functions and management.

Do not know of any vendors that handle all trades involved with this activity in this district.

Effective interaction within an organization is based on terminology generally contrived by the organization. Historical in perspective, organizational communication becomes ingrained in the employees. Outsiders are not privileged with the familiarity of the "language" utilized by the organization.

External vendors are not familiar with TxDOT systems.

Finding a good vendor is an ongoing process. This process requires extensive quality control oversight of each vendor's activities and replacement of any nonperforming vendor. Based on our experience, there is not a sufficient number of quality and reliable private vendors for all functions.

The majority of this function is currently outsourced to many individual vendors.

Table 8.4 - Facilities Management and Maintenance Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.2729	.2059	.771	-.8596	.3138
	3. Systems	-.4402	.2059	.268	-1.0269	.1465
	4. Cost	-1.1699	.2059	.000	-1.7566	-.5832
	5. HR	-.2949	.2059	.707	-.8816	.2918
	6. Vendors	-.5769	.2059	.057	-1.1636	9.792E-03
2. Strategic	1. Mandates	.2729	.2059	.771	-.3138	.8596
	3. Systems	-.1673	.2059	.965	-.7540	.4194
	4. Cost	-.8970	.2059	.000	-1.4837	-.3103
	5. HR	-2.1978E-02	.2059	1.000	-.6087	.5647
	6. Vendors	-.3040	.2059	.679	-.8907	.2827
3. Systems	1. Mandates	.4402	.2059	.268	-.1465	1.0269
	2. Strategic	.1673	.2059	.965	-.4194	.7540
	4. Cost	-.7297	.2059	.005	-1.3164	-.1430
	5. HR	.1453	.2059	.981	-.4414	.7320
	6. Vendors	-.1368	.2059	.986	-.7235	.4500
4. Cost	1. Mandates	1.1699	.2059	.000	.5832	1.7566
	2. Strategic	.8970	.2059	.000	.3103	1.4837
	3. Systems	.7297	.2059	.005	.1430	1.3164
	5. HR	.8750	.2059	.000	.2883	1.4617
	6. Vendors	.5929	.2059	.046	6.234E-03	1.1797
5. HR	1. Mandates	.2949	.2059	.707	-.2918	.8816
	2. Strategic	2.198E-02	.2059	1.000	-.5647	.6087
	3. Systems	-.1453	.2059	.981	-.7320	.4414
	4. Cost	-.8750	.2059	.000	-1.4617	-.2883
	6. Vendors	-.2821	.2059	.745	-.8688	.3047
6. Vendors	1. Mandates	.5769	.2059	.057	-9.7917E-03	1.1636
	2. Strategic	.3040	.2059	.679	-.2827	.8907
	3. Systems	.1368	.2059	.986	-.4500	.7235
	4. Cost	-.5929	.2059	.046	-1.1797	-6.2339E-03
	5. HR	.2821	.2059	.745	-.3047	.8688

Table 8.5 - Facilities Management and Maintenance Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	2.4744		
2. Strategic and Organizational Effectiveness	26	2.7473		
5. Human Resources and Organization Culture	26	2.7692		
3. Organizational Systems and Operations	26	2.9145		
6. Vendors	26	3.0513		
4. Cost and Cost-Efficiency	26		3.6442	
Significance		.057	1.000	

Generally, it is more expensive to outsource most of these functions but we outsource most facilities maintenance so FTE's can be used in other areas.

I have no basis for comparison. The Facilities Management Functions we outsource are not performed by TxDOT Personnel.

If this function is outsourced, productivity and quality of output is questionable unless common goals are shared. TxDOT must maintain proper cost accounting.

If this function is outsourced, quality of output is questionable unless common goals are shared.

We have a licensed electrician, licensed AC repairman and 2 laborers training to get their licenses. Getting a contractor to cover eight counties will be difficult. Overseeing their work would be even more difficult. Outsourcing would provide a warranty, however.

What is lost with a vendor is building specific knowledge and experience with equipment.

What is often overlooked is the services that our operation provides that a private vendor would not provide. All of the employees within the department have a sense of ownership and are looking to perform their jobs to the best of their abilities, making decisions that are in the best interest of the department, whereas a private vendor's first priority is profit.

While many highly skilled employees can be trained to perform duties not associated with this function, many do not have the knowledge, skills and experience that can be transferable within TxDOT.

Table 8.6 - Facilities Management and Maintenance Outsourcing Survey: Post Hoc Multiple Comparisons Between Regions for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) REGION	(J) REGION	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Metro	Urban	.1137	.1775	.919	-.3422	.5696
	Rural	-2.3057E-02	.1595	.999	-.4328	.3866
	Central Office	-1.0089	.3320	.013	-1.8617	-.1560
Urban	Metro	-.1137	.1775	.919	-.5696	.3422
	Rural	-.1367	.1421	.771	-.5017	.2283
	Central Office	-1.1225	.3240	.003	-1.9549	-.2902
Rural	Metro	2.306E-02	.1595	.999	-.3866	.4328
	Urban	.1367	.1421	.771	-.2283	.5017
	Central Office	-.9858	.3145	.009	-1.7938	-.1779
Central Office	Metro	1.0089	.3320	.013	.1560	1.8617
	Urban	1.1225	.3240	.003	.2902	1.9549
	Rural	.9858	.3145	.009	.1779	1.7938

Table 8.7 - Facilities Management and Maintenance Outsourcing Survey: Homogeneous Subsets Between Regions Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Region	N	Subset 1	Subset 2	Subset 3
Urban Districts	42	2.8001		
Metro Districts	30	2.9138		
Rural Districts	78	2.9368		
Central Office	6		3.9226	
Significance		.950	1.000	

Insourcing has provided a timely response and result solution for district H.Q. and grounds. Insourcing has also provided a history of P.M. and repairs on building appliances.

Savings from outsourcing FMM in this district would be (-)$200k/yr.

It is difficult to rate a combination of facilities management and maintenance activities. We currently outsource many facilities maintenance activities such as yard mowing, building cleaning, and facilities improvements without major problems. To outsource facilities management would be much more difficult because we would lose the control of timing and scheduling of critical activities.

Less than 40k per year.

Many of the functions that Building Operations outsources, a maintenance vendor would also have to outsource – such as elevators, fire alarms and fire extinguishers– and would have to figure in a profit for handling. TxDOT also puts each of these items out for bid to give opportunities to various vendors.

Not aware of any laws which would prohibit outsourcing. Currently, Austin Headquarter Building Operations outsources several functions.

Our current practice with outside vendors requires extensive oversight to ensure quality control of outsourced functions. Quality of workmanship would vary greatly without some type of quality control oversight.

Our district outsources a large percentage of work in order to get projects completed. We have limited employees to do in-house work and these same employees check on our outsource projects too. The vendors I have listed above do not cover all the different kinds of projects that are needed. So you would need an architecture design firm to oversee the work if you outsource all facilities management & maintenance projects. They would have to call vendors to do the work and this wouldn't be cost-effective. There is just too many kinds of vendors that would be needed to put all under one contract.

Parties who do not maintain a vested interest in an organization are less willing to make adjustments and sacrifices to ensure minimal disruption and problems if profit margins are effected.

Relying on an outside party to comply with TxDOT's inventory and procurement rules and regulations involves risks. Restrictions involving procurement and inventory activities have been established to minimize misuse of taxpayer funds.

Several vendors have declined our offer to utilize the option to extend their contracts for an additional two years. These vendors have opted to rebid a new contract and compete with other vendors in order to increase the amount they can charge.

Since the necessity to contract this function is driven by available FTEs, not cost savings, we do not have sufficient data to provide an accurate estimate.

Some new tasks, IE Contract Inspection/Oversight.

The assumption that there will be savings that will result from outsourcing this function is not a valid assumption.

The effect of seasonal fluctuation is not of major importance since this function is not seasonal. There exists no argument for or against this supposition.

The experience of outsourcing reflects positive and negative results. Our experience indicates that in-house can provide cost-effective results in some areas.

The percent of our district building maintenance offices' overhead account spent on contracts in FY'99 was 11.4%. However, this doesn't reflect any expenditures from other accounts so it is not representative of the district as a whole.

The wide range of functions make it difficult to give definitive answers to many of these questions. We have a set value (salary) for our employees no matter which one of the functions they are performing. This means, on functions where the going rate for outside vendors is less than our in-house employees, using contractors can save the department money. However, it can go the other way if the going rate for vendors is higher than our employees. These answers assume the district would retain their current FTE allocation.

We would be concerned about response times by the contractor if this function would be outsourced.

The public would not approve of spending more tax money to obtain lesser quality services.

There is no cost savings for outsourcing and you still need employees to check that the work is done correctly.

There would be no savings from outsourcing this function. Contract labor and materials cost is higher than inhouse.

This function supports the core competency of TxDOT which is the construction and maintenance of highways for the State of Texas.

This function, performed in-house can accomplish human resource initiatives such as cultural diversity and gender equality because common goals are shared.

This function, performed in-house, can accomplish strategic initiatives because common goals are shared.

Total loss of ability to perform work leaves agency unable to fix even smallest of problems resulting in very high costs for small repairs. Also, loss of personnel to repair some things, when emergencies occur, greater damage could result due to having to wait for contractors to arrive.

TxDOT would have to shift to contract administration.

TxDOT formed a committee to investigate outsourcing maintenance operations. Their findings were that some outsourced functions are prohibitively expensive and insourcing is cost-effective.

TxDOT provides cost-effective performance in many areas.

TxDOT has invested heavily in training and having employee become familiar with sites. In any situation the end user wants results. The result will come from an employee that does not have to be retained, every time a new contract is awarded.

TxDOT employees have standards and are extensively trained in work safety, cultural diversity, hazardous materials, sexual harassment and many other areas where a private vendor may share these same concerns and would not train their employees as extensively.

Under 1830 ACCOUNT: 99.5% Cost; Under 1840 ACCOUNT: 26.1% Cost

We currently contract out most of our facilities maintenance due to the specialized nature of most of our major repairs such as HVAC and roofing. I don't see farming out the management aspect due to the small number of employees required to manage our facilities.

We are currently contracting many of these duties and are looking to do more in the future (grounds maintenance). Overseeing these contracts has been somewhat cumbersome. We have a total of four personnel in this section that maintain ten counties.

We will need a good contract manager if we outsource more of FMM.

8.4 Actual and Potential Suppliers of this Function

The actual and potential Facilities Management and Maintenance vendors most frequently mentioned by the survey respondents include the following:

A&R Mechanical, Amarillo
AAA Plumbing, Houston
Accurate Air, Houston
Advanced Building Management, El Paso
Alief Electro Mechanical, Houston
Apex Industries, San Antonio
Baum Construction Co.
Best Maint. Service, El Paso
Bill Gibson Associates
Carl Brown, Paris
Curry, Inc., Houston
D&R Plumbing, Palestine
Danco HVAC, Waco
EJ Janitorial & Maintenance Services, Inc.
Elite Reflections, Cedar Park
F&J, Chandler
Goodwill Industries
Goodwill Opportunities, Tyler
Hensel Electric, Waco
J&L Interests, Winnsboro
Jani-King of Austin, Austin
Jiles Electric Services, Atlanta

John Styles, Paris
Kal Tex Electric, Dumas
Labor Works, Nash
Lochridge-Priest Plumbing, Waco
McLarty Baker & Associates, Lubbock
Mid Cities Pest Control
N.R. Johnston Electric, Corpus Christi
Nelson Brothers
New Directions Industries, Lufkin
Owens Electric, Lufkin
Pride Building & Lawn Maint, El Paso
Reed Plumbing, Corpus Christi
Reynosa Construction Inc., Amarillo
Roberts & Petty, Inc.
Service Master, Longview
STE Inc.
Taylor Brothers, Lufkin
Ted Lawson
TIBH, Hurst
Truss Plumbing Service, Lufkin
Universal Bldg Maint, El Paso
White Air Conditioning Co., Corpus Christi
Walling Construction, Waco

8.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Facilities Management and Maintenance (FMM) Function

Certain subfunctions of the Facilities Management and Maintenance (FMM) can and should be outsourced. It is perceived, however, that outsourcing this function is not as cost-efficient as keeping it in-house. In addition, there are regional differences indicating that the FFM central office and the districts are not in agreement with regard to outsourcing FMM. The districts were more favorable to oursourcing FMM than was the central office (GSD).

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing the Facilities Management and Maintenance (FMM) function based on a thorough analysis of data from all TxDOT districts, the General Services Division (central office), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Positive to marginal; central office marginal
Long-Term Effectiveness	Districts marginal; central office negative
Potential for further outsourcing at this time	Marginal Selective outsourcing potential high
Benchmarks (other states)	Marginal (about the same as other states)
Incentive to Outsource	Vendor quality/ availability, cost
Direct Cost-Effectiveness	Negative Selective outsourcing positive

Systems/Operations Effects	Positive to neutral
Organizational Effectiveness Effects	Positive
Human Resources & Culture Effects	Generally positive. Positive in urban and rural districts; marginal to negative in metro districts and central office (GSD)
Vendor-related Effects	Favorable; varies by district & division. Positive in urban and metro districts; negative in rural districts and central office
District - Division Agreement	Generally no. Statistically significance difference in agreement with outsourcing between districts and the FMM central office (GSD)
Recommendation	Selectively outsource of subfunctions

SECTION 9.0

SOURCING THE TXDOT RIGHT-OF-WAY ACQUISITION (ROWA) FUNCTION

9.1 Introduction: Function Definition, Organization and Current Situation

The Right-of-Way Division (ROWD) acquires land to build highways and regulates outdoor advertising and junkyards. The division engages in acquisition for all department purposes, oversees the Relocation Assistance Program Uniform policy for all utilities matters, engages in leasing activities, and insures conformity with the Litter Abatement Act and the Scenic Byways' outdoor advertising guidelines.. The ROWD reported that TxDOT outsourced 15 projects during FY 1998 for some portion of the acquisition activities for 756 parcels. 1426 parcels were acquired by TxDOT in FY 1998.

9.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 9.1 presents the Right-of-Way Acquisition Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 9.1b is provided for interpretation survey responses.

In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor-Related Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 9.2 presents descriptive statistics of the ROWA survey responses. The Between-Subjects Effects shown in Table 9.3 indicates at least one statistically significant ($p<.001$) difference among factors, but no statistically significant ($p<.05$) difference among regions. The factors differed significantly in their suggestion to outsource or not; regions did not differ significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 9.4 and Table 9.5, factor 1 was found to be significantly more favorable to outsourcing than factors 2, 3, 4, 5 and 6.

Table 9.1 - Right-of-Way Acquisition Outsourcing Survey By Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	4	3	3	3	3	4	4	2	4	3	2	3	2	**2**	2	3	2	3	2	4	1	2	5	2	4	2.9	**2**
2	4	2	3	5	5	5	4	2	5	4	2	4	2	**2**	1	3	3	3	2	4	1	2	5	3	4	3.2	**5**
3	2	2	2	3	2	3	3	2	3	3	2	2	2	2	1	2	2	4	1	4	4	2	3	1	2	2.4	**3**
4	2	1	2	2	2	1	2	1	1	2	1	1	2	2	1	2	2	3	2	2	3	2	2	1	1	1.7	**2**
5	4	2	2	4	2	2	2	1	1	2	1	1	2	2	2	2	2	4	2	2	3	1	4	4	2	2.2	**2**
6	3	2	3	5	3	4	3	4	4	4	2	1	3	2	2	4	3	5	2	4	1	2	4	2	4	3.0	**4**
7	3	2	2	3	1	4	4	2	2	2	2	2	2	2	3	4	3	4	2	2	1	2	4	2	4	2.6	**2**
8	3	2	3	4	2	4	3	2	2	3	2	1	2	2	3	4	3	4	2	4	1	2	5	4	4	2.8	**2**
9	4	4	3	5	4	4	5	3	4	3	3	2	2	5	3	4	2	3	2	3	1	2	4	4	4	3.3	**2**
10	4	2	3	5	1	4	5	4	2	3	2	2	2	5	4	4	3	4	3	4	1	3	5	4	5	3.4	**3**
11	5	1	2	1	2	4	2	3	4	5	2	1	3	2	4	2	2	4	1	2	5	3	2	2	3	2.7	**1**
12	3	2	4	4	2	4	5	3	5	3	2	2	4	5	3	4	2	4	1	4	1	2	5	4	2	3.2	**2**
13	5	3	4	5	2	4	5	3	5	3	3	2	3	5	3	5	3	4	3	4	1	2	5	2	5	3.6	**4**
14	3	2	3	4	3	3	4	3	5	3	3	2	2	5	2	5	2	4	2	5	3	2	5	4	4	3.3	**3**
15	3	2	3	4	2	3	5	2	4	4	2	2	2	5	4	4	2	3	2	3	1	2	4	2	2	2.9	**2**
16	4	5	3	3	2	3	5	4	4	4	3	3	5	5	3	5	3	4	4	5	5	3	5	4	5	4.0	**5**
17	2	3	3	5	2	4	5	2	3	4	2	2	4	5	2	3	2	3	3	2	4	2	5	2	5	3.2	**3**
18	1	1	2	2	4	2	2	2	1	3	3	2	2	1	3	2	2	2	2	2	2	4	1	4	1	2.1	**2**
19	3	1	2	2	5	2	3	2	1	2	1	1	2	2	1	2	2	3	2	2	5	2	3	2	2	2.2	**2**
20	1	2	2	1	3	3	1	4	1	1	4	1	2	1	2	1	3	1	4	1	3	4	2	2	2	2.1	**2**
21	1	1	1	1	2	1	2	2	1	3	3	1	4	1	4	1	3	2	4	2	3	4	1	4	1	2.1	**1**
22	2	2	4	4	1	4	4	2	3	4	3	2	2	5	1	3	3	4	2	4	4	2	4	2	4	3.0	**3**
23	4	2	3	3	1	3	2	2	3	2	2	2	2	3	1	4	2	3	2	2	1	2	3	4	3	2.4	**2**
24	3	2	3	4	1	3	3	2	4	2	2	2	2	5	1	3	2	3	2	2	3	2	3	3	3	2.6	**2**
25	1	1	2	3	3	2	2	2	1	3	3	3	3	1	3	1	2	2	2	2	1	4	1	2	1	2.0	**1**
26	5	5	2	4	2	3	4	3	5	2	2	3	4	2	1	4	3	3	4	2	3	2	4	3	4	3.2	**3**
27	2	2	3	4	1	4	2	2	2	2	3	2	2	3	1	2	2	3	3	2	3	2	2	4	3	2.4	**3**
28	4	4	4	5	3	3	4	4	4	2	4	4	2	4	4	4	3	3	2	4	5	2	4	2	5	3.6	**4**
29	4	2	2	5	2	4	5	2	4	3	2	2	2	5	5	2	3	4	2	2	3	2	5	2	5	3.2	**2**
30	4	4	4	5	2	4	4	3	5	4	4	2	2	5	2	5	3	5	2	5	**4**	2	5	2	5	3.7	**4**
AR	**3.1**	**2.3**	**2.7**	**3.6**	**2.3**	**3.3**	**3.5**	**2.5**	**3.1**	**2.9**	**2.4**	**2.0**	**2.5**	**3.2**	**2.4**	**3.1**	**2.5**	**3.4**	**2.3**	**3.0**	**2.6**	**2.3**	**3.7**	**2.8**	**3.3**	**2.8**	**2.6**

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 9.1b - ROWA Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders**.
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees**.
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 9.2 - Right-of-Way Acquisition Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	2.4000	.7226	5
1. External Mandates and Influences	Urban	1.9524	.5909	7
	Rural	2.4872	.6887	13
	Central Office	2.3333	n/a	1
	Total	2.3205	.6699	26
	Metro	3.1429	.8571	5
2. Strategic and Organization Effectiveness	Urban	3.2041	.8878	7
	Rural	3.0220	.8568	13
	Central Office	3.1429	n/a	1
	Total	3.0989	.8159	26
	Metro	3.3111	.5952	5
3. Organization Systems and Operations	Urban	3.0794	.5763	7
	Rural	3.0855	.8644	13
	Central Office	3.1111	n/a	1
	Total	3.1282	.7095	26
	Metro	3.4500	.8732	5
4. Cost and Cost-Efficiency	Urban	3.4286	.4261	7
	Rural	3.6731	.6951	13
	Central Office	4.2500	n/a	1
	Total	3.5865	.6555	26
	Metro	3.2000	.6225	5
5. Human Resources and Organization Culture	Urban	3.0357	.6986	7
	Rural	2.9423	.8301	13
	Central Office	2.7500	n/a	1
	Total	3.0096	.7228	26
	Metro	3.4667	.9888	5
6. Vendors	Urban	3.1905	.9201	7
	Rural	3.1538	.6752	13
	Central Office	3.0000	n/a	1
	Total	3.2179	.7714	26
	Metro	3.1618	.8064	30
All Factors	Urban	2.9818	.8185	42
	Rural	3.0606	.8256	78
	Central Office	3.0979	.6395	6
	Total	3.0603	.8089	156

Table 9.3 - Right-of-Way Acquisition Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	22.878	8	2.860	5.352	.000
Intercept	1460.996	1	1460.996	2734.167	.000
Factors	22.301	5	4.460	8.347	.000
Regions	.576	3	.192	.360	.782
Error	78.549	147	.534		
Total	1562.422	156			
Corrected Total	101.427	155			

R Squared = .226 (Adjusted R Squared = .183)

9.3 Qualitative Assessments: Selected Comments by Survey Respondents

The answers to these questions are based on only outsourcing some projects while performing in-house the majority of our projects. Outsourcing of critical projects would allow the district to meet our heavy letting schedule without hiring additional FTE's. I strongly believe our employees can deliver a better work product than an outsourcer can provide.

This district has limited experience with outsourcing of ROWA, having entered into only one contract in the last year. However, what we have experienced to date indicates that we can anticipate to utilize employee time to train consulting companies on the department policies and procedures. We have also been called upon to solve problems encountered. Because of this, we do not anticipate any significant savings of personnel time or real cost savings to the department by outsourcing of the ROWA.

A few of our major concerns are:

- *The district's accountability for poor contract performance.*
- *Insufficient guidelines from division*
- *Contract enforcement*
- *Possible impacts to local participating agency*
- *Costs*
- *The district's capacity to handle the increased work volume, maintain quality control, provide training and oversight, and meet its timely contractual obligations while operating under existing overloaded conditions.*

Table 9.4 - Right-of-Way Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.7784	.2027	.002	-1.3561	-.2006
	3. Systems	-.8077	.2027	.001	-1.3854	-.2299
	4. Cost	-1.2660	.2027	.000	-1.8438	-.6883
	5. HR	-.6891	.2027	.009	-1.2669	-.1114
	6. Vendors	-.8974	.2027	.000	-1.4752	-.3197
2. Strategic	1. Mandates	.7784	.2027	.002	.2006	1.3561
	3. Systems	-2.9304E-02	.2027	1.000	-.6071	.5484
	4. Cost	-.4876	.2027	.154	-1.0654	9.011E-02
	5. HR	8.929E-02	.2027	.998	-.4885	.6670
	6. Vendors	-.1190	.2027	.992	-.6968	.4587
3. Systems	1. Mandates	.8077	.2027	.001	.2299	1.3854
	2. Strategic	2.930E-02	.2027	1.000	-.5484	.6071
	4. Cost	-.4583	.2027	.210	-1.0361	.1194
	5. HR	.1186	.2027	.992	-.4592	.6963
	6. Vendors	-8.9744E-02	.2027	.998	-.6675	.4880
4. Cost	1. Mandates	1.2660	.2027	.000	.6883	1.8438
	2. Strategic	.4876	.2027	.154	-9.0114E-02	1.0654
	3. Systems	.4583	.2027	.210	-.1194	1.0361
	5. HR	.5769	.2027	.051	-8.2793E-04	1.1547
	6. Vendors	.3686	.2027	.454	-.2092	.9463
5. HR	1. Mandates	.6891	.2027	.009	.1114	1.2669
	2. Strategic	-8.9286E-02	.2027	.998	-.6670	.4885
	3. Systems	-.1186	.2027	.992	-.6963	.4592
	4. Cost	-.5769	.2027	.051	-1.1547	8.279E-04
	6. Vendors	-.2083	.2027	.909	-.7861	.3694
6. Vendors	1. Mandates	.8974	.2027	.000	.3197	1.4752
	2. Strategic	.1190	.2027	.992	-.4587	.6968
	3. Systems	8.974E-02	.2027	.998	-.4880	.6675
	4. Cost	-.3686	.2027	.454	-.9463	.2092
	5. HR	.2083	.2027	.909	-.3694	.7861

Table 9.5 - Right-of-Way Acquisition Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	2.3205		
5. Human Resources and Organization Culture	26		3.0096	
2. Strategic and Organizational Effectiveness	26		3.0989	
3. Organizational Systems and Operations	26		3.1282	
6. Vendors	26		3.2179	
4. Cost and Cost-Efficiency	26		3.5865	
Significance		1.000	.051	

Outsourcing ROWA is the only way this district can achieve the letting volume shown in our STIP and UTP. ROWA and utility adjustments are the "weak link" in our successfully letting projects to contract. It would be difficult and expensive for us to hire and house enough employees to carry out these tasks in a timely manner. I believe our ROWA office is very capable in preparing and administering these types of consultant contracts. We are in the process of outsourcing our first project for this district. This should take place in FY 2000.

This function is currently being outsourced as well as being performed in-house. Most of the in-house personnel provide public relations support in addition to their acquisition assignments. Inquiries from the public must be handled and account for a significant number of man hours. Outsourcing agents do not handle the public and give TxDOT no corporate knowledge to rely upon.

Mr. Ellzey has acquired ROWA for several projects. His performance has been excellent in all respects. Our experience with other outside ROWA agents has been less than satisfactory.

The outsourcing of ROWA may not be cost saving to TxDOT but could have the potential of allowing more ROWA projects to be performed with existing ROWA staff and the consultants.

In my opinion, the staffing of a ROWA section is cost-effective vs. outsourcing if there is a constant demand for each of the ROWA functions.

If there is considerable time between projects, then outsourcing becomes attractive. In our district, I anticipate outsourcing peak demands in order to meet projected letting dates.

Good management is required.

Our experience has ranged from poor to fair, and we have made the following observations:

- *Our existing employees who are very busy are having to train the consultants to do the work. This is counterproductive and disruptive to our work plans.*

- *The consultants do not interact with designers to be able to answer land owners' questions. Most of these questions are referred back to us. This is time consuming for TxDOT.*

- *Consultants are not available to us. They rarely occupy their office and are difficult to reach.*

- *The outsourcing work is difficult to control. There needs to be modifications to the contracts to leave enough funds at the ending tasks or milestones to motivate the consultant to complete the contract. One of our consultants allowed their contract to expire and simply turned over the work to us to finish (32 parcels). For jury trial purposes, we believe there may be significant problems proving actions taken by the consultants if the opposing counsel claims certain actions. The turnover rate with the consultants is high, and there does not appear to be consistency to testify 5 years from now about what exactly happened in each negotiation. As a result, we face a larger than usual risk for bad faith negotiations and possible right to take allegations. There seems to be no way to ensure that consultants comply with statutory requirements of the condemnation process. Since this is a jurisdictional matter, it may require TxDOT to start the entire process over from square one.*

This district has not directly acquired ROWA in a number of years.

Here are our observations:

- *Outsourcing is a tool that will need to be utilized to meet construction letting dates of TxDOT.*

- *Need to support outsourcing at the state offices or division office of TxDOT.*

- *Currently being under utilized due to constraints and/or fear of the unknown.*

- *Need endorsement of Senior Management*

- *Can be a useful tool for meeting goals and to supplement current staff levels.*

As of 1/1/99, the district has not outsourced any ROWA projects. It appears that you could lose some control of actual work and possibly some public relations control by outsourcing. But, by outsourcing, more ROWA projects can be acquired and more projects let to contract.

The district has had considerable success with the Acquisition agencies thus far. Although they usually are not acquiring individual parcels quicker than TxDOT, we are able to contract a number of firms and therefor increase overall the total number of parcels.

A complete outsourcing of this function has not been attempted in the _____ district because of the limited number of certified and interested vendors. Many of the questions were answered from the perspective of outsourcing ROWA surveying for purchase, lease, or donation; but performing control surveying and topographic surveying in-house. These responses may indicate a negative opinion of outsourcing where it was not intended. The cost and long response time have been the main drawbacks of outsourcing surveying. However, outsourcing is essential for the development of legal documents in our ROWA areas.

The three contractors listed above have ongoing projects with this district. Comments are as follows:

- *The time lines set by the contractors have all been understated to the point that extensions are needed on all contracts.*
- *The oversight needed on the projects is far greater than anticipated. It is a full time job for one in-house employee per project with extensive contract management and accounting.*
- *The learning curve for these companies -- to be able to produce a product that can be accepted -- ranges from 4 to 6 months, with continual quality control from the district office.*
- *The fact that the contractors have to be taught how to do the job our employees know well, and the extremely high pay the contractors receive, is very bad for morale.*
- *I see no cost savings in outsourcing projects whatsoever.*

This function is of vital importance in the mission of this district and can be performed more efficiently and effectively in-house; however, to accomplish the work load under current budget and time restraints would require a fully staffed right of way section. We are not opposed to outsourcing during peak workloads, but in the long-run, the overall process should be performed in-house.

Due to the nature of turnkey contracts, once it is let then very little may be done to the vendor to change right of way priorities.

Typically, the property owners and tenants will not receive the same personalized service presently offered by TxDOT personnel. Our efforts are structured to fulfill Title 111 requirements and also to minimize court cases.

Considering the amount of ROWA being acquired in this district, the existing ROWA staff is required to monitor and review ROWA consultants.

Because we are in the process of outsourcing our first project, we have no data that would either support or reject this, but we think that outsourcing would not have an impact -- as there would not be an FTE reduction required.

Although not residing in this district area, there are sufficient vendors desiring to perform this service in the El Paso area.

The geographical location of a vendor does not affect the ability to outsource. Our specifications require a local office.

Employees are needed to oversee the consultant -- to make sure the consultant is abiding by department procedures.

Due to the complexity of ROWA and state and federal procedures, TXDOT employees are much more knowledgeable.

Zero % totally outsourced. All appraisals and some appraisal reviews outsourced which amounted to approx 10% of this function.

The district outsourced appraisal and property management functions but did not outsource a turnkey project.

District-wide surveying was outsourced beginning in FY 96 and used extensively in FY 96, 97, and 99.

I do not anticipate there will be a cost savings in the actual performance of this function. The savings will be obtained through a calculated user cost by moving a project to completion sooner because of overload on our ROWA staff.

No experience or tracking of costs vs. benefits.

The savings is in the amount of time to complete the acquisitions. Without outsourcing, many of the construction projects would be delayed several years.

We do not believe outsourcing this function is as cost-effective as in-house. As far as we are concerned, it would eventually cost more than saved.

Don't have sufficient data to estimate any $ savings.

The cost of outsourcing is estimated to be higher than it would be in-house. But, it would be essential to our ROWA document development, from a legal standpoint.

Outsourcing of the Right-of-Way Acquisition function allows TxDOT to hire additional help for the work intensive activities. These activities are paid for at a premium cost. Therefore, no cost saving. On the other hand, hiring additional resources through outsourcing permits TxDOT to oversee the acquisition of a greater number of parcels. We believe that outsourcing this function has significant potential.

9.4 Actual and Potential Suppliers of this Function

The actual and potential Right-of-Way Acquisition vendors most frequently mentioned by the survey respondents include the following:

Coates Field Services, Oklahoma City, OK
Cobb, Faintly, and Assoc. Inc., Houston
Con-Real, Inc., Grand Prairie
Continental Appraisal Group, Childbeds
Contract Land Staff Inc., Stafford
Morlett, Proust, and Boyd
Crossman Acquisition Inc., Houston
Gulf Coast Property Acquisition Inc, San Antonia, FL
HIM Consultants, Inc., Kimberley
James Daniels and Assoc. Inc., Ft Worth
Jordan Services, Lufkin
Kenneth D Martin and Assoc., Lewisville
Land Acquisition Inc., Austin
Maryland Altobelli Asso.Inc, Atlanta, GA
Mustang Engineering, Inc., Houston
Parker Ellzey, Alice
Pinnacle Consulting Mgmt, Round Rock
Post Buckley, Schuh, & Jernigan, Miami, FL
Real Property Counselors, Austin
Right-of-Way Acquisition Associates, Dallas
Smith-Roberts Land Services, Inc., Oklahoma City, OK
Tarin & Coon, Inc., Houston
The Preshell Group, Phoenix, AZ 85012
TransAmerican Field Services, Inc., Oklahoma City, OK
Universal Field Services Inc., Dallas, Oklahoma City, OK, The Woodlands, Temple, Tulsa

9.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Right-of-Way Acquisition (ROWA) Function

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Right-of-Way Acquisition (ROWA) function based on a thorough analysis of data from all TxDOT districts, the Right-of-Way Division (ROWA central office), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Marginal
Long-Term Effectiveness	Marginal

Potential for further outsourcing at this time	Marginal
Benchmarks (other states)	Unfavorable (less than other states)
Incentive to Outsource	Workload, expertise
Direct Cost-Effectiveness	Negative Selective positive
Systems/Operations Effects	Neutral
Organizational Effectiveness Effects	Neutral to negative
Human Resources & Culture Effects	Neutral to positive
Vendor-related Effects	Neutral to unfavorable
District - Division Agreement	Yes
Recommendation	Increase outsourcing under effective contract management

In order to acquire the ever increasing volume of properties required for transportation projects, TxDOT must utilize all possibilities to multiply its effort. Increasing the outsourcing ROWA should therefore be considered.

SECTION 10.0

SOURCING THE TXDOT TRAINING, QUALITY AND DEVELOPMENT (TQD) FUNCTION

10.1 Introduction: Function Definition, Organization and Current Situation

The Training, Quality and Development (TQD) function consists management and staff development training, technical training, continuous improvement and professional development programs. TxDOT's Human Resources Division (HRD central office) has primary responsibility for this function. With 124 employees, the HRD develops, designs and evaluates training programs, delivers in-house and contracted training to TxDOT employees, provides administrative and operational support for training activities, manages the department's quality and partnering programs, coordinates the department's educational assistance programs, and oversees professional development programs for employees. Subfunctions of TQD include creating department training schedules, registering employees for classes, contracting with vendors for classes, developing curriculum for technical and staff/management classes, creating and revising courses, managing a full-time Master's program, managing and creating governing rules and policies for the department education assistance program, managing the department's facilitation program, managing the department's partnering program, managing the department's quality awards program, and administering the Texas Quality Initiative.

The mission of the Human Resources Division is to develop, guide, support and maintain quality human resources programs and services to recruit, hire, develop and retain a productive, well-qualified, effective and diverse workforce. Each section of the Human Resources Division contributes to our mission in the following ways.

- the Administrative Management Section supports the division's daily operations in areas such as new hire processing, budget development and monitoring, automation and development/communication of human resources policies. The section also administers executive applicant screening and processing of open records requests for the department.

- the Personnel Administration Section supports departmental human resources functions by processing personnel transactions, insurance, and unemployment claims and ensuring that accurate records are maintained. This section is involved in supporting the conversion of human resources information systems from a mainframe to a client-server based system.

- the Employment Opportunities Section seeks to attract qualified employees through the implementation of recruitment programs, provision of customer service to internal and external job applicants and development of recruitment materials. Staff participate in recruitment events and administer programs such as the Temporary Recruitment Program, Summer Employment Program, Conditional Grant Program, the Transportation and Civil Engineering (TRAC) Program, and Student Intern and Co-op Programs.

- the Employee Relations Section contributes to employee morale and promotes good relations between the department and its employees by providing benefits and services which meet employees' needs. The section administers the following programs: sick leave pool, extended sick leave, family and medical leave, employee assistance program, substance abuse, Americans with Disabilities Act and deferred compensation.

- the Classification and Staffing Section serves the needs of customers by providing a classification system that is equitable, fair and in compliance with the State Position Classification Act. During FY 1999, this section has increased its focus on customer service by adding Business Job Descriptions (BJDs) to the division's Intranet site, revising the Job Applicant Tracking System to make postings easier, and creating broader and more generic BJDs.

- the Training, Quality and Development Section assists in the professional skills development of TxDOT employees through a system of needs assessment, curriculum design and development, training delivery and continuous evaluation. This section also manages the department's continuous improvement and partnering programs. This section offering 80% of all training classes at district sites.

In FY 1998, 85% of the approximately 1,000 classes sponsored by TQD were outsourced and managed by contract managers. The remaining 15%, or 150 classes, were either management training or TxDOT policy/procedure classes and facilitated by in-house personnel. As indicated in Table 10.1, 85% to 95% of the expenditures for TQD programs have been outsourced during FY 97-FY 99.

10.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 10.2 presents the Training, Quality and Development Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 10.2b is provided for interpretation survey responses. In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost- Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor-Related Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 10.1 - Training, Quality and Development Program Expenditures, 1997-1999

Training, Quality and Development Programs - Not Contracted				
	FY97	**FY98**	**FY99**	
Area Engineer	$0	$307	$0	
Construction Inspection	$49,969	$64,359	$0	(contracted in FY99)
Design	$8,675	$6,807	$0	(contracted in FY99)
Enhancing Presentation Skills	$0	$1,381	$4,622	
Human Resource Administration	$13,603	$0	$1,000	
Interviewing and Hiring	$6,726	$5,067	$5,790	
Leadership at Work	$0	$3,681	$15,740	
Leadership Skills for Success	$6,867	$5,391	$8,200	
Maintenance Section Supervisor	$8,149	$5,909	$3,600	
Management Skills for Success	$14,710	$56,589	$60,352	
Mastering Metrics in Minutes	$1,747	$1,024	$2,600	
Metric Project Inspection	$0	$6,770	$3,600	
New Employee Orientation	$549	$1,991	$3,608	
Progressive Discipline	$2,859	$1,522	$3,719	
Seven Habits	$0	$228,932	$0	
TEAMS	$2,341	$1,423	$0	
Train the Trainer	$0	$0	$0	
	$116,195	$391,153	$112,831	

Training, Quality and Development Programs - Contracted				
	FY97	**FY98**	**FY99**	
Construction Inspection	N/A	N/A	$320,846	
Design	N/A	N/A	$320,846	
Engineer Professional	unknown	$397,743	$350,000	
National Highway Institute	unknown	$171,043	$300,000	
Nuclear Gauge Training	$10,940	$16,265	$30,000	
Phoenix	$12,762	$12,762	$12,900	
Technical Training	$1,457,005	$1,476,948	$1,627,196	
Transportation Conference	$40,000	$50,000	$50,000	
	$1,520,707	**$2,124,761**	**$3,011,787**	

Table 10.2 - Training and Quality Development Outsourcing Survey By Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	3	5	4	3	4	3	3	4	5	2	3	2	2	5	4	2	3	3	2	2	2	2	2	2	2	3.0	5
2	3	4	3	3	4	3	4	5	4	2	2	2	2	5	4	2	3	3	2	2	2	2	4	2	2	3.0	5
3	3	3	3	3	2	3	2	4	3	3	2	2	2	5	1	1	2	3	1	2	4	2	2	2	2	2.5	3
4	2	2	3	3	3	2	3	3	2	1	2	2	2	4	3	1	2	3	2	2	3	3	2	2	3	2.4	2
5	3	2	2	3	3	2	3	5	4	2	2	2	2	4	3	1	2	3	2	2	3	2	2	2	3	2.6	5
6	3	4	3	3	4	4	4	5	3	2	2	2	2	4	4	1	2	3	2	2	2	2	2	2	3	2.8	4
7	4	3	3	3	4	3	2	4	4	2	2	2	2	4	4	2	4	3	2	3	2	2	3	2	3	2.9	5
8	3	3	5	3	4	3	4	4	4	2	2	2	2	5	4	2	3	3	2	3	3	2	2	2	2	3.0	5
9	4	2	3	3	4	2	3	4	5	1	2	2	2	4	4	2	4	3	2	2	2	2	4	2	2	2.8	4
10	4	2	2	3	4	3	2	3	4	2	2	2	2	3	4	2	2	3	3	2	2	1	2	2	2	2.5	3
11	1	3	3	3	3	4	5	4	5	5	4	4	4	2	2	4	2	3	1	4	4	4	4	4	3	3.4	1
12	4	3	3	3	3	3	2	5	5	2	3	2	2	5	4	2	2	3	1	2	2	2	4	2	3	2.9	5
13	4	3	3	3	3	3	3	5	5	2	4	3	2	5	4	2	3	3	3	4	3	2	5	3	3	3.3	5
14	3	4	4	3	4	3	4	4	5	1	2	2	2	5	4	2	3	3	2	3	5	1	4	2	4	3.2	3
15	5	3	2	3	3	3	3	3	5	1	2	2	2	4	3	2	4	3	2	2	3	1	4	2	2	2.8	5
16	5	4	2	3	3	3	3	5	5	3	4	3	3	5	4	3	4	3	4	4	3	2	4	3	4	3.6	5
17	5	3	3	3	4	3	2	4	5	2	4	2	2	5	4	2	3	3	3	3	3	2	4	2	3	3.2	5
18	1	2	3	3	3	3	3	1	5	4	2	3	4	2	1	4	2	3	2	3	3	3	2	3	2	2.7	1
19	4	2	2	3	3	3	2	4	3	2	2	2	2	4	3	2	2	3	2	2	2	2	2	4	3	2.6	2
20	3	3	4	3	3	3	3	2	1	3	3	3	4	2	3	4	3	3	4	2	2	2	2	3	3	2.8	1
21	2	3	2	3	3	3	4	2	2	3	4	4	4	2	2	4	2	3	4	3	3	4	2	4	3	3.0	1
22	4	3	2	3	3	2	2	1	5	2	2	2	2	3	3	3	3	3	2	4	3	1	4	2	3	2.7	1
23	3	3	2	3	3	3	2	3	5	1	2	2	2	2	3	4	2	3	2	2	3	1	2	2	2	2.5	3
24	4	3	4	3	3	3	3	4	4	3	2	2	2	3	3	3	3	3	2	2	3	1	2	2	3	2.8	4
25	1	2	3	3	3	3	3	1	2	3	2	3	4	2	2	4	2	3	2	2	3	4	2	3	2	2.6	1
26	5	4	4	3	3	3	3	4	4	2	3	4	2	4	4	2	2	3	4	3	3	3	4	4	3	3.3	5
27	4	3	3	3	3	3	4	3	5	2	3	2	2	5	3	2	3	3	3	2	2	2	5	2	3	3.0	2
28	1	3	3	3	3	3	4	3	5	1	2	2	2	3	3	2	2	3	2	2	2	2	4	2	2	2.6	2
29	4	3	2	3	2	3	2	4	5	2	2	2	2	5	4	2	3	3	2	2	2	2	3	2	4	2.8	5
30	4	4	4	3	4	3	2	5	5	2	4	4	2	5	4	2	4	3	2	4	3	2	3	4	3	3.4	4
D-S	3.3	3.0	3.0	3.0	3.3	2.9	3.0	3.6	4.1	2.2	2.6	2.4	2.4	3.9	3.3	2.4	2.7	3.0	2.3	2.6	2.7	2.1	3.0	2.5	2.7	2.9	3.5

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 10.2b - TQD Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument*.

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders**.
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees**.
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 10.3 presents descriptive statistics of the TQD survey responses. The Between-Subjects Effects shown in Table 10.4 indicates at least one statistically significant ($p<.001$) difference among factors. In addition, there was also at least one statistically significant ($p<.05$) difference among regions. Factors as well as regions differed significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 10.5 and Table 10.6, factor 1 was significantly more favorable to outsourcing than factors 2, 3, 5, 6, which, in turn, were significantly more favorable to outsourcing than factor 4. Further multiple comparison post hoc analysis between regions indicated that the districts and the TQD central office (HRD) differed significantly in their views toward outsourcing as indicated in Tables 10.7 and 10.8 . These data indicate that the districts were significantly more favorable toward outsourcing than was the TQD central office (HRD).

10.3 Qualitative Assessments: Selected Comments by Survey Respondents

Training could be contracted out. Full time FTEs would perform primary functions.

There are several areas that would make outsourcing of this function unfeasible. Some of these include budget restraints and monitoring. It is critical that we stay within our training budget and monitor the remaining amount available for use in each account each month. The District Training Coordinator acts as a liaison between the Austin division and supervisors, employees and instructors to schedule the classes as well as making arrangements to use equipment for some classes, class locations and registration forms. The coordinator is also responsible for communicating with the above people when there are cancellations and/or substitutions due to a number of reasons such as illness, emergencies, and whether that prevents the training. The training must also be input into our computer system when the training is completed. The system deals with confidential information and requires special access to personnel records. The Education Assistance Program must also be closely monitored to ensure compliance with policy.

The courses presented by the TxDOT TQ&D section provide training specific to TxDOT policy, which greatly enhances the value of the courses. Outsourcing would not be cost-effective or beneficial to the Austin District. In-house training provides the Austin District with the flexibility needed.

Some of our training is already outsourced.

The largest expense of training is travel and employee time, so having it centrally located in our district would save this expense.

With training, it is desirable to have in-house for part and outsourcing for part. In many of the classes, TxDOT employees who teach are able to share their experiences and are able to relate to the students. In other cases, TxDOT should contract the training out to an "expert" in the field. Contracting out training in some areas such as computers, heavy equipment, and automotive would be more cost-effective.

Table 10.3 - Training and Quality Development Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	2.7333	.3651	5
1. External Mandates and Influences	Urban	2.4286	.7127	7
	Rural	2.5385	.5859	13
	Central Office	2.6667	n/a	1
	Total	2.5513	.5652	26
	Metro	3.2286	.3289	5
2. Strategic and Organization Effectiveness	Urban	3.0204	.9200	7
	Rural	2.6813	.7957	13
	Central Office	4.4286	n/a	1
	Total	2.9451	.8162	26
	Metro	3.2444	.1648	5
3. Organization Systems and Operations	Urban	2.9683	.9638	7
	Rural	2.6752	.6796	13
	Central Office	3.6667	n/a	1
	Total	2.9017	.7237	26
	Metro	3.4500	.8178	5
4. Cost and Cost-Efficiency	Urban	3.3571	.6901	7
	Rural	3.2692	.7870	13
	Central Office	4.2500	n/a	1
	Total	3.3654	.7458	26
	Metro	3.3000	.7374	5
5. Human Resources and Organization Culture	Urban	2.4286	.8381	7
	Rural	2.7308	.8001	13
	Central Office	3.7500	n/a	1
	Total	2.7981	.8307	26
	Metro	3.3333	.4082	5
6. Vendors	Urban	3.2381	.6587	7
	Rural	2.9231	.4545	13
	Central Office	4.6667	n/a	1
	Total	3.1538	.5980	26
	Metro	3.2149	.5298	30
All Factors	Urban	2.9068	.8393	42
	Rural	2.8030	.7140	78
	Central Office	3.9048	.7194	6
	Total	2.9526	.7543	156

Table 10.4 - Training and Quality Development Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	19.698	8	2.462	5.284	.000
Intercept	695.591	1	695.591	1492.803	.000
Factors	10.360	5	2.072	4.447	.001
Regions	9.338	3	3.113	6.680	.000
Error	68.497	147	.466		
Total	1448.141	156			
Corrected Total	88.195	155			

R Squared = .223 (Adjusted R Squared = .181)

Most outsourcing of training is done through the Austin headquarters.

The training function in this district is performed by one person, who is also cross trained in the safety and hazardous materials functions. The employee provides safety and HR related training to new and existing employees; as well as fill info safety and hazardous material employees in their absences. An outsourced/contract person would not be able to provide this capability and the cost of doing so would be extremely difficult to calculate.

Outsourcing for TQ&D is handled at the state level.

Some training is more cost-effective in outsourcing. However, there are some areas that are TxDOT specific and could not be outsourced.

Some specific training requirements may be more cost-effective outsourcing. These may be limited in availability and perhaps additional costs associated with travel. In-house CBT and videos should be considered as possible options for some training.

It is very important that the person providing training services to the district to be someone who can be counted on to be in the position for a long time. Contractor personnel would be subject to frequent turnover.

Much of the training is done out in the maintenance section and area engineer offices. Lack of nearby outsource businesses creates 3-4 hour travel time; thus greatly increasing the cost.

Table 10.5 - Training and Quality Development Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.3938	.1893	.298	-.9333	.1457
	3. Systems	-.3504	.1893	.433	-.8899	.1891
	4. Cost	-.8141	.1893	.000	-1.3536	-.2746
	5. HR	-.2468	.1893	.783	-.7863	.2927
	6. Vendors	-.6026	.1893	.018	-1.1421	-6.3048E-02
2. Strategic	1. Mandates	.3938	.1893	.298	-.1457	.9333
	3. Systems	4.335E-02	.1893	1.000	-.4962	.5829
	4. Cost	-.4203	.1893	.228	-.9598	.1192
	5. HR	.1470	.1893	.972	-.3925	.6865
	6. Vendors	-.2088	.1893	.880	-.7483	.3307
3. Systems	1. Mandates	.3504	.1893	.433	-.1891	.8899
	2. Strategic	-4.3346E-02	.1893	1.000	-.5829	.4962
	4. Cost	-.4637	.1893	.140	-1.0032	7.584E-02
	5. HR	.1036	.1893	.994	-.4359	.6431
	6. Vendors	-.2521	.1893	.767	-.7917	.2874
4. Cost	1. Mandates	.8141	.1893	.000	.2746	1.3536
	2. Strategic	.4203	.1893	.228	-.1192	.9598
	3. Systems	.4637	.1893	.140	-7.5841E-02	1.0032
	5. HR	.5673	.1893	.033	2.779E-02	1.1068
	6. Vendors	.2115	.1893	.874	-.3280	.7511
5. HR	1. Mandates	.2468	.1893	.783	-.2927	.7863
	2. Strategic	-.1470	.1893	.972	-.6865	.3925
	3. Systems	-.1036	.1893	.994	-.6431	.4359
	4. Cost	-.5673	.1893	.033	-1.1068	-2.7792E-02
	6. Vendors	-.3558	.1893	.415	-.8953	.1837
6. Vendors	1. Mandates	.6026	.1893	.018	6.305E-02	1.1421
	2. Strategic	.2088	.1893	.880	-.3307	.7483
	3. Systems	.2521	.1893	.767	-.2874	.7917
	4. Cost	-.2115	.1893	.874	-.7511	.3280
	5. HR	.3558	.1893	.415	-.1837	.8953

Table 10.6 - Training and Quality Development Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	2.5513		
5. Human Resources and Organization Culture	26	2.7981	2.7981	
3. Organizational Systems and Operations	26	2.9017	2.9017	2.9017
2. Strategic and Organizational Effectiveness	26	2.9451	2.9451	2.9451
6. Vendors	26		3.1538	3.1538
4. Cost and Cost-Efficiency	26			3.3654
Significance		.298	.415	.140

Table 10.7 - Training and Quality Development Outsourcing Survey: Post Hoc Multiple Comparisons Between Regions for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) REGION	(J) REGION	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Metro	Urban	.3081	.1632	.233	-.1111	.7273
	Rural	.4119	.1466	.026	3.519E-02	.7887
	Central Office	-.6898	.3053	.108	-1.4741	9.445E-02
Urban	Metro	-.3081	.1632	.233	-.7273	.1111
	Rural	.1038	.1306	.857	-.2318	.4395
	Central Office	-.9979	.2979	.004	-1.7633	-.2326
Rural	Metro	-.4119	.1466	.026	-.7887	-3.5189E-02
	Urban	-.1038	.1306	.857	-.4395	.2318
	Central Office	-1.1018	.2892	.001	-1.8447	-.3588
Central Office	Metro	.6898	.3053	.108	-9.4446E-02	1.4741
	Urban	.9979	.2979	.004	.2326	1.7633
	Rural	1.1018	.2892	.001	.3588	1.8447

Table 10.8 - Training and Quality Development Outsourcing Survey: Homogeneous Subsets Between Regions Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Region	N	Subset 1	Subset 2	Subset 3
Urban Districts	78	2.8030		
Metro Districts	42	2.9068		
Rural Districts	30	3.2149		
Central Office	6		3.9048	
Significance		.296	1.000	

The function is integrated with safety and hazardous materials functions, leading to reduction in costs necessitated by travel times (265 miles to farthest maintenance subsection).

Loss of direct control over the individual providing the service.

TEEX provided some training.

Training should be outsourced. Using internal trainers especially in the engineering function will reduce productivity.

Several courses are already outsourced.

Most problematic with facilitation and training registration.

Management and policy/procedure training, if outsourced, would negatively impact culture, organizational values.

For management, policy/procedure training, facilitation and partnering.

Cost of outsourcing recent programs was clearly more expensive. However, it saved time that had been spent by our short supply of engineers as instructors.

Based on past experience with outsourcing training, we believe there would be minimal cost savings and possibly increased costs in contract management and supervision.

There are other considerations for outsourcing other than monetary. A recent outsourcing effort was at a significantly higher cost. However, the decisive factor was the inability to spare in-house staff to instruct the courses. In addition to the increased costs in dollars, there were increases in program management staff and travel to ensure proper quality in the outsourced classes.

10.4 Actual and Potential Suppliers of this Function

The actual and potential Training and Quality Development vendors most frequently mentioned by the survey respondents include the following:

Angelina College, Lufkin
Angelo State University
Blinn Junior College, Bryan
College Station, TX
Cyber
Fred Pryor
Grayson County College, Denison
Howard Payne University, Brownwood
Human Resource Solutions
Lubbock Christian University
New Horizons
Paris Junior College, Paris, TX
Pfeiffer Company, San Diego, CA
Productivity Point, Dallas
South Plains College
Texas Tech University
Texas A&M Commerce, Commerce
Texas Engineering Extension Service
Texas Engineering Extension, College Station
Texas State Technical College, Brownwood
Texas A&M University
Texas Computers, College Station
Wayland Baptist University

10.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Training and Quality Development (TQD) Function

Some subfunctions (e.g., some training/development courses/programs) of the Training and Quality Development (TQD) function can and should be outsourced. It is generally perceived, however, that outsourcing this function is not as cost-efficient as keeping it in-house. In addition, there are regional differences indicating that the TQD central office (HRD Division Office) and the districts are not in agreement with regard to outsourcing TQD. The districts were generally more favorable to oursourcing TQD than was the TQD central office (HRD).

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing the Training and Quality Development (TQD) function based on a thorough analysis of data from all TxDOT districts, the Human Resource Division central office, information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Marginal to positive
Long-Term Effectiveness	Marginal; Central office negative
Potential for further outsourcing at this time	Marginal Selective outsourcing high

Benchmarks (other states)	Unfavorable (less than other states)
Incentive to Outsource	Vendor quality, availability, cost
Direct Cost Effectiveness	Negative Selective outsourcing positive
Systems/Operations Effects	Urban and rural districts neutral to positive; central office and metro districts negative
Organizational Effectiveness Effects	Rural districts positive; other regions negative
Human Resources & Culture Effects	Positive in urban and rural districts; neutral to negative in metro districts and central office
Vendor-related Effects	Neutral to unfavorable
District - Division Agreement	No. Statistically significance difference in agreement with outsourcing between districts and the TQD central office (HRD)
Recommendation	Selectively outsource some subfunctions

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SECTION 11.0

SOURCING THE TXDOT RECRUITING FUNCTION

11.1 Introduction: Function Definition, Organization and Current Situation

Recruiting is defined as activities intended to yield qualified applicants for TxDOT positions. Examples include advertising for open positions, attending job fairs and career fairs, and developing recruiting materials. This function is performed at each district office with the assistance of the TxDOT Human Resources Division (HRD), Austin, which also engages in this activity on the behalf of districts in certain occupational categories and for its own staffing needs. See Section 10.0 of this report for a complete description of the Human Resources Division.

The Human Resources Division reported that no significant part of the Recruiting function has been outsourced. Likewise, all TxDOT districts reported no expenditures for outsourcing Recruiting.

11.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 11.1 presents the Recruiting Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 11.1b is provided for interpretation survey responses.

In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor Related-Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 11.2 presents descriptive statistics of the Recruiting survey responses. The Between-Subjects Effects shown in Table 11.3 indicates at least one statistically significant ($p<.001$) difference among factors. The factors differed significantly in their suggestion to outsource or not; regions did not differ significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 11.4 and Table 11.5, factor 1 was significantly more favorable to outsourcing than factor 4.

Table 11.1 - Recruiting Outsourcing Survey By Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	3	3	2	1	3	3	3	3	4	3	3	2	2	4	4	4	2	3	2	2	2	2	2	2	5	2.8	4
2	5	3	2	3	2	3	3	2	5	2	2	2	2	3	4	4	3	3	2	2	2	2	2	2	4	2.8	4
3	3	2	2	1	2	2	2	2	3	1	1	2	2	4	3	4	3	3	1	2	2	2	4	2	2	2.3	2
4	3	2	3	1	2	2	1	2	3	1	2	2	2	3	3	2	2	3	2	2	3	2	2	2	2	2.2	2
5	1	2	2	1	2	2	2	2	3	1	2	2	2	2	3	1	2	3	2	2	3	2	2	2	2	2.0	2
6	5	4	2	3	2	3	3	2	5	2	2	4	2	4	4	4	3	3	2	2	2	2	4	4	3	3.0	4
7	3	3	3	3	4	3	4	2	5	2	2	2	2	4	4	2	3	3	2	2	2	2	4	2	3	2.8	4
8	3	3	2	2	2	3	4	2	5	4	2	2	2	4	4	4	3	3	2	2	2	2	4	2	3	2.8	3
9	3	3	3	2	4	2	4	2	3	3	4	4	2	4	4	4	3	3	2	2	2	1	4	4	4	3.0	3
10	5	2	2	1	4	3	3	4	3	4	4	2	2	4	4	5	2	3	3	2	3	1	4	2	4	3.0	4
11	1	4	5	3	5	3	1	5	5	5	5	2	4	2	2	2	3	3	1	4	4	4	2	2	2	3.2	3
12	5	3	2	2	3	3	3	2	5	2	2	2	1	4	4	4	3	3	1	2	2	2	2	2	4	2.7	3
13	5	3	2	2	3	3	5	4	5	2	2	4	1	4	4	4	3	3	3	2	3	2	4	4	3	3.2	4
14	4	3	2	3	2	3	3	2	5	2	3	4	2	3	4	4	2	3	2	2	2	2	3	4	3	2.9	4
15	5	3	2	2	3	3	4	2	5	3	2	4	2	3	4	4	3	3	2	2	2	2	3	4	4	3.0	2
16	4	4	3	3	2	3	5	4	5	3	3	2	3	4	4	4	3	3	4	4	3	3	5	2	5	3.5	3
17	5	3	2	2	2	3	4	4	4	4	3	4	2	5	3	5	3	3	3	2	2	2	2	4	3	3.2	2
18	2	3	3	4	2	3	2	1	1	3	3	2	4	2	2	1	3	3	2	2	2	3	2	2	4	2.4	2
19	4	2	4	3	4	3	2	2	5	2	2	4	2	4	3	3	2	3	2	2	2	2	2	4	3	2.8	3
20	1	3	3	3	4	3	3	3	1	3	3	4	4	3	3	5	2	3	4	1	3	3	2	4	3	3.0	4
21	1	3	4	3	3	3	2	3	1	3	4	2	4	2	2	2	3	3	4	2	3	4	2	2	3	2.7	4
22	4	2	3	2	5	2	3	3	5	2	2	5	2	3	3	4	2	3	2	4	3	3	4	5	3	3.2	2
23	4	2	2	3	2	2	1	2	3	2	2	2	2	4	3	2	2	3	2	2	2	2	2	2	1	2.2	2
24	5	3	2	3	4	2	2	4	3	2	2	2	2	4	3	2	2	3	2	3	2	2	3	2	1	2.6	2
25	1	2	3	3	3	3	1	1	1	3	3	2	4	2	1	1	3	3	2	2	3	3	2	2	1	2.2	3
26	4	4	4	3	5	3	3	3	3	3	3	4	3	5	3	5	4	3	4	3	3	3	4	4	3	3.6	3
27	3	2	2	2	2	3	2	2	3	2	2	2	1	4	4	4	2	3	3	2	2	2	2	2	2	2.4	2
28	4	2	3	2	4	3	2	2	5	2	3	2	2	4	4	2	2	3	2	3	2	2	4	2	3	2.8	2
29	5	3	2	3	2	3	5	2	5	3	3	4	2	4	4	4	2	3	2	2	2	2	2	4	3	3.0	2
30	5	3	4	3	5	3	3	4	5	2	4	4	2	4	4	5	4	3	2	4	2	2	4	4	4	3.6	4
AR	3.5	2.8	2.7	2.4	3.1	2.8	2.8	2.6	3.8	2.5	2.7	2.8	2.3	3.5	3.4	3.4	2.6	3.0	2.3	2.3	2.4	2.3	2.9	2.8	3.0	2.8	2.9

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 11.1b - Recruiting Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument*.

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders**.
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees**.
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

11.3 Qualitative Assessments: Selected Comments by Survey Respondents

In reality, an outside company could probably perform the recruiting or some of it for TxDOT, however, I feel the quality of work, knowledge and expertise our employees have acquired in this area far outweighs what outsourcing could accomplish.

The recruitment efforts in the Austin District is currently done by district personnel. The district personnel provide an efficient and effective method to fill the recruitment needs of the Austin District. The cost of outsourcing this function would be phenomenal.

The hardest recruiting duties are among the upper levels that require experienced personnel and recruiting programs do not address this market.

Outsourcing would appear to be a time-consuming and expensive function. I do think it needs to be strong with TxDOT. Even when we had region recruiters, I think they could have gone further. The only negative comment about outsourcing this function would be that external recruiters to TXDOT cannot sell a person on working here as well as if the recruiter has actually worked for the Department.

The job knowledge required for applicant selection in specifically technical engineering areas is something outside vendors would not be able to provide as well as the in-house hiring supervisors currently performing these tasks. Hiring the wrong applicant or/and unqualified applicant could prove to be more costly to the department in training costs than the possible savings of outsourcing this function.

Considering the state's policy on accepting the lowest bid, it is questionable whether a contracted vendor could match the type of professional service the department currently provides.

Recent efforts to outsource recruiting activities done by other state agencies in our local area have proved to be unsuccessful. The business was forced to take bankruptcy and the state agency has been doing these activities as before. How can this type of contracting out be cost-effective?

Outsourcing on various positions (ones we know that are a problem recruiting) would be beneficial to the district and department in order to achieve EEO diversity goals.

Some locations could consider outsourcing as a means to contact various groups/individuals. EEO and diversity goals may be achieved in utilizing all options for recruiting.

This district historically has a large # of qualified applicants for posted positions. The need to recruit has been minimal.

Due to the wide scope of our business it, would be extremely difficult to find one vendor who could accommodate our needs.

Outsiders do not know the KSA's for particular jobs.

Table 11.2 - Recruiting Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	2.3333	.6667	5
1. External Mandates and Influences	Urban	2.3333	.7698	7
	Rural	2.5385	.3976	13
	Central Office	2.0000	n/a	1
	Total	2.4231	.5542	26
	Metro	2.7143	1.0252	5
2. Strategic and Organization Effectiveness	Urban	3.1020	.5577	7
	Rural	2.8462	.8112	13
	Central Office	3.1429	n/a	1
	Total	2.9011	.7621	26
	Metro	3.0667	.7269	5
3. Organization Systems and Operations	Urban	2.9524	.8579	7
	Rural	2.8205	.7021	13
	Central Office	3.0000	n/a	1
	Total	2.9103	.7125	26
	Metro	3.0500	.5969	5
4. Cost and Cost-Efficiency	Urban	3.4286	.7176	7
	Rural	3.3654	.6968	13
	Central Office	3.0000	n/a	1
	Total	3.3077	.6607	26
	Metro	2.9000	.6755	5
5. Human Resources and Organization Culture	Urban	2.8929	.8881	7
	Rural	2.9808	.8066	13
	Central Office	3.0000	n/a	1
	Total	2.9423	.7593	26
	Metro	3.5333	.6912	5
6. Vendors	Urban	2.9048	.4179	7
	Rural	2.9744	.5351	13
	Central Office	2.3333	n/a	1
	Total	3.0385	.5760	26
	Metro	2.9329	.7715	30
All Factors	Urban	2.9357	.7516	42
	Rural	2.9209	.6982	78
	Central Office	2.7460	.4643	6
	Total	2.9205	.7150	156

Table 11.3 - Recruiting Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	10.915	8	1.364	2.936	.005
Intercept	1330.558	1	1330.558	2862.991	.000
Factors	10.718	5	2.144	4.612	.001
Regions	.197	3	6.565E-02	.141	.935
Error	68.317	147	.465		
Total	1409.790	156			
Corrected Total	79.232	155			

R Squared = .138 (Adjusted R Squared = .091)

Advertising done with various newspapers. We rely heavily on division recruiters although this would still be considered in-house to the department. Should be done in-house to give it the TxDOT personal touch.

11.4 Actual and Potential Suppliers of this Function

The actual and potential Recruiting related vendors most frequently mentioned by the survey respondents include the following:

Pate Resources Group, Beaumont

Personnel Services, Brownwood

Kelley Services, Abilene

Manpower, Abilene

Interim Personnel, Abilene

Talent Tree

Apple One Employment Services

The Wilson Group, Corpus Christi

Drake Beam Morin, Austin

Black & Associates, Brownwood

L. K. Jordan & Assoc., Corpus Christi

The Harbour Group, Houston

Remedy Intelligent Staffing

Briones R A & Co

Express Personnel Services

Human Element of Business, Inc.

In-Bond Central

Keysource Inc

Snelling & Snelling Services

Texas Workforce Commission

Table 11.4 - Recruiting Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.4780	.1891	.116	-1.0168	6.079E-02
	3. Systems	-.4872	.1891	.103	-1.0260	5.163E-02
	4. Cost	-.8846	.1891	.000	-1.4234	-.3458
	5. HR	-.5192	.1891	.067	-1.0580	1.958E-02
	6. Vendors	-.6154	.1891	.014	-1.1542	-7.6575E-02
2. Strategic	1. Mandates	.4780	.1891	.116	-6.0788E-02	1.0168
	3. Systems	-9.1575E-03	.1891	1.000	-.5480	.5297
	4. Cost	-.4066	.1891	.261	-.9454	.1322
	5. HR	-4.1209E-02	.1891	1.000	-.5800	.4976
	6. Vendors	-.1374	.1891	.979	-.6762	.4014
3. Systems	1. Mandates	.4872	.1891	.103	-5.1631E-02	1.0260
	2. Strategic	9.158E-03	.1891	1.000	-.5297	.5480
	4. Cost	-.3974	.1891	.286	-.9362	.1414
	5. HR	-3.2051E-02	.1891	1.000	-.5709	.5068
	6. Vendors	-.1282	.1891	.984	-.6670	.4106
4. Cost	1. Mandates	.8846	.1891	.000	.3458	1.4234
	2. Strategic	.4066	.1891	.261	-.1322	.9454
	3. Systems	.3974	.1891	.286	-.1414	.9362
	5. HR	.3654	.1891	.382	-.1734	.9042
	6. Vendors	.2692	.1891	.712	-.2696	.8080
5. HR	1. Mandates	.5192	.1891	.067	-1.9579E-02	1.0580
	2. Strategic	4.121E-02	.1891	1.000	-.4976	.5800
	3. Systems	3.205E-02	.1891	1.000	-.5068	.5709
	4. Cost	-.3654	.1891	.382	-.9042	.1734
	6. Vendors	-9.6154E-02	.1891	.996	-.6350	.4427
6. Vendors	1. Mandates	.6154	.1891	.014	7.657E-02	1.1542
	2. Strategic	.1374	.1891	.979	-.4014	.6762
	3. Systems	.1282	.1891	.984	-.4106	.6670
	4. Cost	-.2692	.1891	.712	-.8080	.2696
	5. HR	9.615E-02	.1891	.996	-.4427	.6350

Table 11.5 - Recruiting Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	2.4231		
2. Strategic and Organizational Effectiveness	26	2.9011	2.9011	
3. Organizational Systems and Operations	26	2.9103	2.9103	
5. Human Resources and Organization Culture	26	2.9423	2.9423	
6. Vendors	26		3.0385	
4. Cost and Cost-Efficiency	26		3.3077	
Significance		.067	.261	

11.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Recruiting Function

With respect to outsourcing the Recruiting function, the data suggest that the Recruiting function can be outsourced to a certain extent. It is perceived, however, that outsourcing this function is not as cost-efficient as keeping it in-house. Moreover, all the other indicators are relatively neutral meaning that neither insourcing nor outsourcing had strong appeal over one another

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Recruiting function based on a thorough analysis of data from all TxDOT districts, the Human Resource Division central office (HRD), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Marginal to positive
Long-Term Effectiveness	Marginal
Potential for further outsourcing at this time	Marginal Selective outsourcing medium
Benchmarks (other states)	Unfavorable (less than other states)

Incentive to Outsource	Need, occupational level/skill required
Direct Cost-Effectiveness	Neutral to negative
Systems/Operations Effects	Neutral to positive
Organizational Effectiveness Effects	Neutral to positive
Human Resources & Culture Effects	Neutral to positive
Vendor-related Effects	Positive
District - Division Agreement	Yes
Recommendation	Increase outsourcing under effective contract management

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SECTION 12.0

SOURCING THE TXDOT BENEFITS PROCESSING (BP) FUNCTION

12.1 Introduction: Function Definition, Organization and Current Situation

Benefits Processing (BP) involves services provided by the Human Resources Division to TxDOT employees related to health insurance coverage, retirement programs and flexible benefits programs. Certain aspects of benefits administration are conducted at the district level. These services include: responding to questions and concerns from employees; dissemination of informational materials regarding state insurance programs; handling bulk mailings such as insurance forms and booklets, U.S. Savings Bonds, ERS annual statements and newsletters; review of exception reports from the Employee Retirement System (ERS) to identify and correct inaccurate benefits information. The remaining Benefits Processing activities are conducted by the Human Resource Division central office, Austin. See Section 10 of this report for a complete description of the Human Resources Division. Field (district) human resource management personnel perform benefits processing as part of their overall duties. Neither the BP central office nor the districts reported any significant outsourcing activity or expenditures for benefits processing outsourcing.

12.2 Survey Results and Analysis: Quantitative Assessments

Table 12.1 presents the Benefits Processing Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 12.1b is provided for interpretation survey responses. In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor Related-Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 12.2 presents descriptive statistics of the Benefits Processing survey responses. The Between-Subjects Effects analysis in Table 12.3 reveals no statistically significant ($p<.001$) difference among factors as well as among regions. In other words, factors as well as regions did not differ significantly in their suggestion to outsource or not. A post hoc analysis was not conducted since no significant differences existed between factors or regions.

Table 12.1 - Benefits Processing Outsourcing Survey By Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	5	4	5	5	5	5	4	5	5	3	3	2	2	5	5	5	2	3	2	2	5	4	4	2	5	3.9	3
2	4	3	4	4	5	4	5	4	5	2	1	2	2	5	4	5	2	3	2	2	5	4	2	2	5	3.4	2
3	5	3	3	5	5	5	4	2	5	4	2	2	2	5	5	5	4	4	1	3	5	4	5	2	5	3.8	3
4	3	4	3	5	5	4	3	1	3	2	3	4	2	4	4	5	3	3	2	2	3	3	2	4	3	3.2	2
5	3	3	4	5	4	5	2	2	2	2	2	4	2	4	4	1	3	3	2	2	3	2	2	4	3	2.9	3
6	5	3	4	5	3	5	4	2	5	2	3	2	2	5	4	4	3	2	2	2	5	4	2	2	4	3.4	3
7	3	4	5	5	5	5	4	2	5	3	3	2	2	5	4	5	2	2	2	2	4	4	5	2	4	3.6	3
8	5	3	3	5	4	4	5	2	5	4	3	2	2	5	4	5	3	2	2	2	5	4	4	2	4	3.6	3
9	5	3	5	5	5	5	5	5	5	4	4	2	2	5	5	5	3	2	2	2	5	4	4	2	4	3.9	4
10	5	3	3	3	5	3	3	2	3	3	4	2	2	5	4	5	4	1	3	2	3	3	4	2	4	3.2	3
11	5	4	3	2	5	4	5	5	1	5	5	3	4	5	1	2	3	4	1	4	4	5	4	3	3	3.6	4
12	2	3	4	4	5	5	5	5	3	2	2	3	2	5	5	5	3	3	1	3	4	4	4	3	4	3.6	4
13	5	3	5	4	3	5	5	5	4	2	3	4	2	5	5	5	4	4	3	3	5	4	4	4	4	4.0	4
14	3	2	3	4	5	3	4	4	3	2	4	2	2	4	4	5	3	3	2	4	4	4	3	2	5	3.4	2
15	5	3	3	1	5	5	5	5	4	3	3	2	2	5	5	5	4	4	2	2	4	4	3	2	5	3.6	2
16	5	4	5	3	5	4	5	5	4	3	2	4	3	5	5	4	3	3	4	4	3	4	4	4	5	4.0	5
17	5	3	3	3	5	4	4	5	4	2	3	2	2	5	5	5	4	3	3	2	5	4	4	2	3	3.6	3
18	1	3	1	3	1	1	1	1	5	3	2	4	4	3	1	1	3	4	2	2	2	2	2	4	2	2.3	3
19	5	2	4	2	5	2	5	2	3	2	5	2	2	4	4	5	2	3	2	3	5	3	2	2	3	3.2	5
20	3	4	3	4	5	2	3	3	2	3	3	2	4	3	2	1	3	3	4	2	3	3	1	2	3	2.8	2
21	1	4	4	1	2	2	2	3	3	3	2	2	4	1	1	2	2	3	4	3	3	2	2	2	3	2.4	3
22	5	3	3	1	5	3	3	3	4	4	4	4	2	5	4	4	3	3	2	4	3	4	4	4	3	3.5	3
23	3	2	3	3	2	2	2	2	2	2	2	2	2	4	2	4	2	3	2	2	3	3	2	2	2	2.4	3
24	3	3	4	4	5	2	3	5	2	3	2	2	2	4	5	4	3	3	2	2	5	3	3	2	3	3.2	3
25	1	4	1	3	1	2	2	1	3	3	2	2	4	2	1	1	3	4	2	2	3	3	1	2	2	2.2	1
26	4	4	5	4	2	3	3	3	3	3	3	4	2	4	4	4	4	3	4	3	3	4	4	4	3	3.5	3
27	3	2	3	3	2	2	5	2	2	2	2	3	2	4	4	4	3	3	3	2	3	4	3	3	3	2.9	2
28	5	2	4	2	3	2	4	2	5	3	2	4	2	4	4	3	3	3	2	2	2	4	4	4	3	3.1	2
29	5	3	3	3	2	3	5	2	5	3	4	4	2	5	4	5	3	3	2	2	2	4	2	4	3	3.3	2
30	5	3	5	1	5	4	4	5	4	3	4	4	2	5	4	5	4	3	2	4	5	4	3	4	5	3.9	3
AR	3.9	3.1	3.6	3.4	4.0	3.5	3.8	3.2	3.6	2.8	2.9	2.8	2.4	4.3	3.8	4.0	3.0	3.0	2.3	2.5	3.8	3.6	3.1	2.8	3.6	3.3	2.9

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 12.1b - BP Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders.**
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees.**
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 12.2 - Benefits Processing Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	3.7333	.5477	5
1. External Mandates and Influences	Urban	3.0476	.7310	7
	Rural	3.0769	.7091	13
	Central Office	2.6667	n/a	1
	Total	3.1795	.7070	26
	Metro	3.9714	.6421	5
2. Strategic and Organization Effectiveness	Urban	3.5102	.7948	7
	Rural	3.5275	1.0472	13
	Central Office	2.8571	n/a	1
	Total	3.5824	.8934	26
	Metro	3.5333	.6867	5
3. Organization Systems and Operations	Urban	3.2540	.5356	7
	Rural	3.2906	.8589	13
	Central Office	3.1111	n/a	1
	Total	3.3205	.7148	26
	Metro	3.8000	.8551	5
4. Cost and Cost-Efficiency	Urban	3.4643	.8219	7
	Rural	3.5769	.7245	13
	Central Office	3.7500	n/a	1
	Total	3.5962	.7385	26
	Metro	3.6500	.4183	5
5. Human Resources and Organization Culture	Urban	3.3929	.8997	7
	Rural	3.2692	.9545	13
	Central Office	2.7500	n/a	1
	Total	3.3558	.8342	26
	Metro	3.2667	.4944	5
6. Vendors	Urban	3.0952	.3171	7
	Rural	3.3590	.6591	13
	Central Office	3.3333		1
	Total	3.2692	.5335	26
	Metro	3.6591	.6103	30
All Factors	Urban	3.2940	.6904	42
	Rural	3.3500	.8271	78
	Central Office	3.0780	.4107	6
	Total	3.3839	.7497	156

Table 12.3 - Benefits Processing Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7.012	8	.876	1.608	.127
Intercept	756.696	1	756.696	1388.531	.000
Factors	3.263	3	1.088	1.996	.117
Regions	3.749	5	.750	1.376	.237
Error	80.109	147	.545		
Total	1873.473	156			
Corrected Total	87.121	155			

R Squared = .080 (Adjusted R Squared = .030)

12.3 Qualitative Assessments: Selected Comments by Survey Respondents

HR could be contracted out and save FTEs for other functions.

Medical information is confidential. Quality and customer service in this area is extremely critical to our employees and their families. Employees rely heavily on HR to answer questions and assist them with all insurance concerns. I feel we have built a relationship of confidence and trust with all our employees and would be very disappointed (as I feel they would also) to see this major function lost to outsourcing.

We are totally against outsourcing benefits processing.

Outsourcing does not eliminate the need for HR personnel and will raise cost of expenses in outsourcing. Customer service would be a key role in this function. Employee gets better service from the district office.

I think this function should be on-site for the convenience of the employees. I don't think they would approve of someone other than TxDOT. I think there would be problems between insurance changes and payroll. There are a few problems now, but I see more with outsourcing. There are local brokers, but their cost (% of total contract) would limit companies, HMO and groups, that they represent. Brokers would push participation with groups that they have best contract with regardless of what is best for the employee. Some current vendors would not participate because they would not be willing to pay brokerage fees. I don't know what types of fees are currently paid so it is hard to assess the impact of outsourcing.

We have received much negative feedback from people in companies who currently outsource their benefits processing. In these companies, the employees receive a 1-800 number to contact the company providing the outsourcing. When the employees call this number with a benefits problem, most times they must leave a message on a machine or on voice mail and are not contacted until the next day or even several days later. We often have employees who call from their doctor's office and need a problem resolved immediately in order for them to be seen by the doctor. We are usually able to correct their problem in time for them to continue with their appointment. If this function is outsourced, these employees may have to make payments for doctor's appointments "out of pocket" and receive later reimbursement. This could cause serious financial hardship for many employees. We feel a lower level of customer service would be provided through outsourcing, which would be very detrimental on employee morale.

Benefits processing should not be outsourced.

Outsourcing benefits processing at this district would significantly reduce the quality of service which is given to both our current employees, as well as the retirees. Many of our retirees don't and won't just talk to anyone about their benefit concerns. They rely on someone they have built trust and confidence in. This takes a one-on-one level of service, which would require more people if outsourced.

Benefits are administered by ERS and operate independently of the district; therefore, many questions in this survey, as relating to cost, are not available at the district level.

12.4 Actual and Potential Suppliers of this Function

The actual and potential Benefits Processing vendors most frequently mentioned by the survey respondents include the following:

SFG Benefits Administration, Austin
ANCO Deferred Compensation and Retirement Programs, Boston, MA

12.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Benefits Processing (BP) Function

The research data reveal that the Benefits Processing function should continue to be insourced. No differences exist among factors or regions. All of the means favor insourcing as well.

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Benefit's Processing (BP) function based on a thorough analysis of data from all TxDOT districts, the Human Resource Division central office (HRD), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Negative
Long-Term Effectiveness	Negative
Potential for outsourcing at this time	Low
Benchmarks (other states)	Favorable (more than other states)
Incentive to Outsource	None observed
Direct Cost-Effectiveness	Very negative
Systems/ Operations Effects	Neutral to negative
Organizational Effectiveness Effects	Negative
Human Resources & Culture Effects	Negative
Vendor-related Effects	Neutral to unfavorable
District - Division Agreement	Yes
Recommendation	Continue to insource at this time

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SECTION 13.0

SOURCING THE TXDOT PARTNERING/QUALITY FACILITATION (P/QF) FUNCTION

13.1 Introduction: Function Definition, Organization and Current Situation

The Training, Quality and Develop (TQD) Section of the Human Resources Division coordinates the department's continuous improvement programs. Quality facilitation refers to the section's efforts to provide trained facilitators for TxDOT meetings, retreats, and workgroups to assist them in reaching effective solutions. Partnering is the joint effort between TxDOT and construction project contractors and other service providers to enhance business relationships through the use of quality processes. The TQD Section provided trained facilitators for partnering workshops aimed at improving relationships between stakeholders, reducing contract claims and improving project schedules. Quality facilitation support comes from three sources: a pool of twenty six contracted professional facilitation services vendors; one hundred thirty-three TxDOT internal facilitators specifically trained and certified to facilitate partnering workshops; and a small number of qualified partnering facilitators who are employees of some construction contractors. Partnering facilitators are proficient in construction terminology and processes, and follow a more precise workshop agenda to focus on specific project issues.

The PQ/F that is outsourced is done so at the district level, typically as part of a project construction budget. Only five districts reported outsourcing any PQ/F, with three of these reporting 100% of PQ/F outsourced. PQ/F district expenditures are not centrally tracked.

13.2 Survey Results and Factor Analysis: Quantitative Assessments

Table 13.1 presents the P/QF Outsourcing Survey Results (raw data) by question number, district, and central office response. Table 13.1b is provided for interpretation survey responses. In the data analysis tables for this function which follow, **Factor 1** (outsourcing of this function as impacted by *External Mandates and Influences*) is the mean average of all responses to survey statements 4, 5 and 22; **Factor 2** (the impact of outsourcing this function on *Strategic and Organization Effectiveness*) is the mean average of all responses to survey statements 1, 2, 3, 10, 13, 17 and 29; **Factor 3** (the impact of outsourcing this function on *Organization Systems and Operations*) is the mean average of all responses to survey statements 6, 8, 12, 14, 19, 21, 23, 28 and 30; **Factor 4** (the impact of outsourcing this function on *Cost and Cost-Efficiency*) is the mean average of all responses to survey statements 16, 18, 25 and 27; **Factor 5** (the impact of outsourcing this function on *Human Resources and Organization Culture*) is the mean average of all responses to survey statements 7, 9, 11, and 15; and **Factor 6** (outsourcing this function as impacted by *Vendor-Related Factors*) is the mean average of all responses to survey statements 20, 24 and 26. Responses to survey statements 11, 18, 20, 21 and 25 were reversed in data analysis so that averages of < 3.0 would indicate a favorableness to Outsourcing, and averages of ≥ 3.0 would indicate a favorableness to Insourcing, relative strength of each indicated by the direction of the mean from 3.0.

Table 13.1 - Partnering/Quality Facilitation Outsourcing Survey By Question Number, District and Central Office Response

Q#	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	AQR-D	CO
1	2	2	2	2	1	5	4	2	1	2	1	2	2	3	2	2	1	4	2	2	2	2	4	1	5	2.3	5
2	2	4	2	3	2	4	4	4	1	2	2	3	2	2	3	2	1	4	2	2	2	2	4	1	4	2.6	5
3	2	2	2	3	1	2	3	1	1	2	1	1	2	2	2	2	1	3	1	2	1	2	2	1	2	1.8	5
4	2	2	2	3	1	2	1	1	1	1	1	1	2	2	1	2	1	3	2	2	1	2	2	1	2	1.6	5
5	2	1	2	3	2	3	2	1	1	2	2	1	2	2	1	1	1	3	2	2	2	2	2	2	2	1.8	5
6	2	2	2	3	2	2	3	1	1	2	1	2	2	4	2	2	1	4	2	2	2	2	2	2	2	2.1	3
7	2	2	3	3	1	4	2	1	1	2	1	2	2	3	2	2	1	4	2	2	2	2	2	1	3	2.1	4
8	2	2	2	3	1	2	4	1	1	2	1	2	2	2	2	2	1	3	2	2	2	2	2	1	3	2.0	5
9	2	1	3	3	2	4	4	1	1	2	1	2	2	2	4	2	1	3	2	2	2	2	2	1	2	2.1	2
10	2	1	2	3	2	2	3	1	1	2	2	2	2	3	4	1	1	3	3	2	3	2	4	1	2	2.2	4
11	2	3	3	3	5	2	1	3	4	5	2	5	4	2	2	4	3	3	1	4	4	4	1	1	2	2.9	1
12	2	3	3	3	2	2	2	1	1	2	1	2	2	4	3	2	1	3	1	2	2	2	4	1	4	2.2	3
13	2	3	2	3	2	2	4	1	1	2	1	2	2	4	3	2	1	3	3	2	2	2	4	1	2	2.2	5
14	2	2	2	3	2	2	4	1	1	2	1	1	2	4	2	2	1	3	2	2	3	2	2	1	2	2.0	4
15	2	2	2	3	2	2	2	1	2	2	2	1	2	2	2	2	1	3	2	2	2	2	2	1	2	1.9	5
16	3	4	3	3	2	5	5	2	5	3	4	5	3	5	5	2	3	2	4	4	4	3	5	4	5	3.7	5
17	2	3	2	3	1	2	2	2	1	2	2	3	2	5	2	1	1	4	3	2	2	2	2	1	4	2.2	5
18	3	2	4	3	3	1	2	4	1	4	2	1	4	5	2	2	3	2	2	3	2	3	1	2	2	2.5	1
19	2	1	3	3	3	3	2	1	1	2	1	2	2	2	2	2	1	3	2	2	4	2	1	1	2	2.0	3
20	4	4	3	3	3	1	2	5	2	4	4	4	4	2	4	4	5	3	4	2	3	3	3	5	2	3.3	3
21	4	4	4	3	4	4	3	5	4	4	4	5	4	4	4	4	5	3	4	4	3	4	4	4	4	4.0	1
22	2	2	3	3	2	2	2	1	1	2	2	1	2	2	2	2	1	3	2	2	2	2	2	1	2	1.9	3
23	2	2	2	3	2	2	2	1	1	1	2	1	2	4	2	2	1	3	2	2	2	2	2	1	2	1.9	3
24	2	2	2	3	2	3	3	1	1	2	2	1	2	3	2	2	1	4	2	2	2	2	2	1	2	2.0	3
25	3	2	2	3	3	1	2	4	2	4	2	1	4	1	1	4	3	2	2	2	2	3	1	2	2	2.3	1
26	2	3	3	3	2	4	3	1	4	3	3	2	2	3	3	2	2	3	4	3	3	3	4	2	2	2.8	1
27	2	2	2	3	2	4	4	1	2	1	2	1	2	2	3	1	1	3	3	2	2	2	2	1	2	2.1	4
28	2	3	3	3	2	4	3	1	2	2	2	1	2	4	2	2	1	3	2	2	2	2	2	1	3	2.2	5
29	2	2	3	3	2	3	4	1	1	2	2	2	2	4	3	2	1	3	2	2	2	2	2	1	3	2.2	5
30	2	2	3	3	2	2	4	1	1	2	1	2	2	3	3	2	1	4	2	2	3	2	2	2	4	2.3	5
AR	2.2	2.3	2.5	3.0	2.1	2.7	2.9	1.7	1.6	2.3	1.8	2.0	2.4	3.0	2.5	2.1	1.6	3.1	2.3	2.3	2.3	2.3	##	1.5	2.7	2.3	3.5

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing, except on Q#s 11, 18, 20, 21 and 25 where the opposite applies. Strength relative. Q# = Survey Question Number. Columns A-Y = District Responses. AQR-D = Average Question Response by all Districts. CO = Central Office Response. AR = Average Survey Response by Districts and Central Office.

Table 13.1b - P/QF Outsourcing Survey Statements (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in the *Central Office Survey Instrument*; read "TxDOT" as "this district" in the *District Level Survey Instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders.**
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees.**
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

Table 13.2 presents descriptive statistics of the P/QF survey responses. The Between-Subjects Effects shown in Table 13.3 indicates at least one statistically significant ($p<.001$) difference among factors. In addition, there was also at least one statistically significant ($p<.05$) difference among regions. Factors as well as regions differed significantly in their suggestion to outsource or not.

Based on the post hoc analysis presented in Table 13.4 and Table 13.5, factor 1 was found to be significantly more favorable to outsourcing than factor 6, and factors 2, 3, 5, 6, were found to be significantly more favorable to outsourcing than factor 4. Further multiple comparison post hoc analysis between regions indicated that the districts and the P/QF central office (HRD) differed significantly in their views toward outsourcing as indicated in Table 13.6 and Table 13.7. These data indicate that the districts were significantly more favorable toward outsourcing than was the P/QF (HRD) central office.

13.3 Qualitative Assessments: Selected Comments by Survey Respondents

Partnering and Quality facilitation should be contracted out.

By insourcing, the department will save dollars and have a much higher technical basis.

This district usually had outside facilitators and the contractors began to complain about the cost. We now have in-house trained facilitators and it is a lot more cost-effective.

Efforts are minimal in this area and outsourcing would cost more than in-house. The remoteness of this district will add to extra expenses also.

The current partnering provision provides for other outsourcing of this function and offers both options depending upon mutual agreement or the inability to reach a mutual agreement.

Our district has the human resources needed to carry out this process. We have 10 employees who were trained in continuous improvement and who are certified TxDOT facilitators. We also have four employees who are certified to facilitate partnering sessions.

For maintenance and construction projects, formal partnering is now optional. An informal partnering style is currently used by area engineers during pre-construction meetings, which incorporates the basic elements of the partnering philosophy. Formal partnering is still encouraged in this district on more complex projects.

We currently outsource facilitation on large projects > $5Mil. On smaller projects we include the partnering as part of our pre-construction conference.

*We let 35 contracts last year that required either formal or informal (in-house) partnering. Average cost formal ($1500); avg cost Informal ($100). $1400 savings in-house * 35 = $49,000 savings for in-house partnering.*

Table 13.2 - Partnering/Quality Facilitation Outsourcing Survey: Descriptive Statistics

Responses < 3.0 = favorable to Outsourcing; ≥3.0 = favorable to Insourcing. Strength relative.

Factors	Region	Mean Response	Standard Deviation	N
	Metro	2.1333	.5578	5
1. External Mandates and Influences	Urban	1.4762	.5040	7
	Rural	1.8462	.4833	13
	Central Office	4.3333	n/a	1
	Total	1.8974	.7228	26
	Metro	2.2000	.4802	5
2. Strategic and Organization Effectiveness	Urban	2.1020	.8153	7
	Rural	2.2857	.8123	13
	Central Office	4.8571	n/a	1
	Total	2.3187	.8874	26
	Metro	2.3111	.4260	5
3. Organization Systems and Operations	Urban	1.7619	.7040	7
	Rural	2.1709	.6377	13
	Central Office	4.0000	n/a	1
	Total	2.1581	.7263	26
	Metro	2.9000	.3791	5
4. Cost and Cost-Efficiency	Urban	3.4643	1.1495	7
	Rural	3.2500	.6693	13
	Central Office	4.7500	n/a	1
	Total	3.2981	.8247	26
	Metro	2.3500	.6021	5
5. Human Resources and Organization Culture	Urban	2.1429	.8643	7
	Rural	2.3654	.5265	13
	Central Office	4.0000	n/a	1
	Total	2.3654	.7008	26
	Metro	2.4667	.3801	5
6. Vendors	Urban	2.5238	1.0157	7
	Rural	2.4872	.6613	13
	Central Office	2.3333	n/a	1
	Total	2.4872	.6943	26
	Metro	2.3935	.5043	30
All Factors	Urban	2.2452	1.0362	42
	Rural	2.4009	.7550	78
	Central Office	4.0456	.9136	6
	Total	2.4208	.8675	156

Table 13.3 - Partnering/Quality Facilitation Outsourcing Survey: General Linear Model Univariate Tests of Between-Subjects Effects

Dependent Variable: Degree of disagreement with outsourcing.

Source	Type II Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	46.580	8	5.823	12.214	.000
Intercept	914.212	1	914.212	1917.689	.000
Factors	29.391	5	5.878	12.330	.000
Regions	17.189	3	5.730	12.019	.000
Error	70.079	147	.477		
Total	1030.871	156			
Corrected Total	116.659	155			

R Squared = .399 (Adjusted R Squared = .367)

There are several certified facilitators in this district who are willing and able to meet the facilitation needs of our district. Outsourcing can negatively affect their morale and sense of worth.

If the public/customers and stakeholders were aware of the internal facilitators that are available and the time and money spent on training them, I think they would want the Department to use them.

Don't have anyone trained.

All in house facilitators have always had full-time jobs in other areas. They volunteered their services as needed.

None in this district but there are many in state.

I am not aware of any vendors for this function within the district, but traveling to perform this function is not a problem.

This function managed by Austin Division.

Nothing was paid by change order during 1998, primarily because most of the partnering was facilitated in-house by the Area Engineers or the contractors picked up the expense for facilitation. In 1997, we paid $2356.63 for partnering facilitation. In 1996, we paid $5641.61.

100% of partnering facilitation related to construction projects. 0% of facilitation for workshops internal to the district.

Table 13.4 - Partnering/Quality Facilitation Outsourcing Survey: Post Hoc Multiple Comparisons Between Factors for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) FACTOR	(J) FACTOR	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1. Mandates	2. Strategic	-.4212	.1915	.238	-.9670	.1245
	3. Systems	-.2607	.1915	.750	-.8064	.2850
	4. Cost	-1.4006	.1915	.000	-1.9464	-.8549
	5. HR	-.4679	.1915	.141	-1.0137	7.776E-02
	6. Vendors	-.5897	.1915	.025	-1.1355	-4.4032E-02
2. Strategic	1. Mandates	.4212	.1915	.238	-.1245	.9670
	3. Systems	.1606	.1915	.960	-.3851	.7063
	4. Cost	-.9794	.1915	.000	-1.5251	-.4337
	5. HR	-4.6703E-02	.1915	1.000	-.5924	.4990
	6. Vendors	-.1685	.1915	.951	-.7142	.3772
3. Systems	1. Mandates	.2607	.1915	.750	-.2850	.8064
	2. Strategic	-.1606	.1915	.960	-.7063	.3851
	4. Cost	-1.1400	.1915	.000	-1.6857	-.5942
	5. HR	-.2073	.1915	.889	-.7530	.3384
	6. Vendors	-.3291	.1915	.519	-.8748	.2167
4. Cost	1. Mandates	1.4006	.1915	.000	.8549	1.9464
	2. Strategic	.9794	.1915	.000	.4337	1.5251
	3. Systems	1.1400	.1915	.000	.5942	1.6857
	5. HR	.9327	.1915	.000	.3870	1.4784
	6. Vendors	.8109	.1915	.000	.2652	1.3566
5. HR	1. Mandates	.4679	.1915	.141	-7.7763E-02	1.0137
	2. Strategic	4.670E-02	.1915	1.000	-.4990	.5924
	3. Systems	.2073	.1915	.889	-.3384	.7530
	4. Cost	-.9327	.1915	.000	-1.4784	-.3870
	6. Vendors	-.1218	.1915	.988	-.6675	.4239
6. Vendors	1. Mandates	.5897	.1915	.025	4.403E-02	1.1355
	2. Strategic	.1685	.1915	.951	-.3772	.7142
	3. Systems	.3291	.1915	.519	-.2167	.8748
	4. Cost	-.8109	.1915	.000	-1.3566	-.2652
	5. HR	.1218	.1915	.988	-.4239	.6675

Table 13.5 - Partnering/Quality Facilitation Outsourcing Survey: Homogeneous Factor Subsets Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Factor	N	Subset 1	Subset 2	Subset 3
1. External Mandates and Influences	26	1.8974		
3. Organizational Systems and Operations	26	2.1581	2.1581	
2. Strategic and Organizational Effectiveness	26	2.3187	2.3187	
5. Human Resources and Organization Culture	26	2.3654	2.3654	
6. Vendors	26		2.4872	
4. Cost and Cost-Efficiency	26			3.2981
Significance		.141	.519	1.000

We have outsourced this function in the past, but none in 1998. Definitely more expensive to outsource.

In fact, outsourcing this function will cost more than if we performed it in-house.

Would increase cost greatly. Can be performed cheaper in-house.

Savings of about $750 to $1000 per formal partnering.

TxDOT has state-wide purchase of service contracts with several pre-qualified facilities.

13.4 Actual and Potential Suppliers of this Function

The actual and potential P/QF vendors most frequently mentioned by the survey respondents include the following:

Alsop & Associates, Carlsbad, NM
Clark & Associates
FMI Corporation, Denver, CO
Garza, Fisher & Associates, Austin
Murphy Martin & Associates
Neff Creative Partnering, Austin
P3, Bedford
Partnering Works 200 Manual
Partnering for Success, Irving
Productivity Through People, Phoenix, AZ
Smith/Associates, Kingswood
Stevens & Associates, Kingswood
TAMCO, Palestine
Taylor & Associates, Austin

Table 13.6 - Partnering/Quality Facilitation Outsourcing Survey: Post Hoc Multiple Comparisons Between Regions for Observed Means Using Tukey's Honestly Significant Difference (HSD) Test

Sig. <.05 means significantly different (95% Confidence Interval)

(I) REGION	(J) REGION	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
Metro	Urban	.1483	.1650	.805	-.2757	.5724
	Rural	-7.3769E-03	.1483	1.000	-.3884	.3737
	Central Office	-1.6521	.3088	.000	-2.4454	-.8588
Urban	Metro	-.1483	.1650	.805	-.5724	.2757
	Rural	-.1557	.1321	.641	-.4952	.1838
	Central Office	-1.8005	.3013	.000	-2.5746	-1.0263
Rural	Metro	7.377E-03	.1483	1.000	-.3737	.3884
	Urban	.1557	.1321	.641	-.1838	.4952
	Central Office	-1.6447	.2925	.000	-2.3962	-.8933
Central Office	Metro	1.6521	.3088	.000	.8588	2.4454
	Urban	1.8005	.3013	.000	1.0263	2.5746
	Rural	1.6447	.2925	.000	.8933	2.3962

Table 13.7 - Partnering/Quality Facilitation Outsourcing Survey: Homogeneous Subsets Between Regions Using Tukey's Honestly Significant Difference (HSD) Test

Means for groups in homogeneous subsets are displayed.

Region	N	Subset 1	Subset 2	Subset 3
Urban Districts	42	2.2452		
Metro Districts	30	2.3935		
Rural Districts	78	2.4009		
Central Office	6		4.0456	
Significance		.914	1.000	

13.5 Conclusions: The Long-Term Impact, Cost-Effectiveness, and Potential of Outsourcing the Partnering/Quality Facilitation (P/QF) Function

The research data reveal that certain subfunctions of the Partnering/Quality Facilitation (P/QF) Function can be outsourced even though there are differences between the central office and the other locations. In effect, the central office favors keeping this function in-house, while the other locations favor outsourcing.. The respondents generally perceived, however, that outsourcing this function was not as cost-efficient as keeping it in-house. In addition, there were regional differences indicating that the P/QF central office (HRD) and the districts were not in agreement with regard to outsourcing PQF. The districts were more favorable to oursourcing P/QF than was the central office (HRD).

The following summarizes the long-term impact, cost-effectiveness, and overall potential of outsourcing TxDOT's Partnering/Quality Facilitation (P/QF) Function based on a thorough analysis of data from all TxDOT districts, the Human Resource Division central office (HRD), information from other state departments of transportation, vendor assessment, and an analysis of local economic conditions relative to this function:

Long-Term Impact	Districts positive; central office very negative
Long-Term Effectiveness	Marginal; central office negative
Potential for further outsourcing at this time	Marginal; selective outsourcing high
Benchmarks (other states)	Unfavorable (less than other states)
Incentive to Outsource	Need. External influences.
Direct Cost-Effectiveness	Neutral to negative
Systems/Operations Effects	Positive
Organizational Effectiveness Effects	Neutral to positive
Human Resources & Culture Effects	Districts neutral to positive; central office negative
Vendor-related Effects	Very favorable

District - Division Agreement	No
Recommendation	Increase selective outsourcing under effective contract management

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SECTION 14.0

RECOMMENDATIONS ON MAKING THE SOURCING DECISION: THE FUNCTIONAL SOURCING DECISION SUPPORT MODEL (FSDSM)

14.1 Introduction

Outsourcing is the strategic use of outside resources to perform activities traditionally handled by internal staff and resources, or simply paying another company to provide services that an organization might otherwise have employed its own staff to perform.

Outsourcing is also a management strategy by which an organization procures major, noncore functions from specialized service providers. Organizations have always 1) hired special contractors for particular types of work or to level-off peaks and valleys in their workload, 2) formed long-term relationships with firms whose capabilities complement their own, and 3) contracted for shared access to resources not currently available to the company. The difference with subcontracting and outsourcing is that outsourcing involves the wholesale restructuring of an organization around core competencies and outside relationships.

When an organization is considering outsourcing versus insourcing a particular business function, the current decision process probably possesses many variables with high uncertainty. The purpose of this section is to provide TxDOT organizational units with a decision instrument that can make an unstructured process into a more structured one. As such, the focus of this section is to recommend a structured decision model process and model to assist management in making outsourcing decisions.

14.2 Decision Support Systems (DSS) in General

The concept of decision support has evolved from two main areas of research: the theoretical studies of organizational decision-making during the late 1950s and early 1960s and the technical work on interactive computer systems in the 1960s. Today, a number of disciplines provide the substantive foundations for DSS development and research. Database researchers have contributed tools and research on managing data. The term decision support system, and its acronym DSS, remains a useful and inclusive term for many types of information systems that support management decision-making. If a software program runs on a personal computer and can help a manager make a decision, then it can be referred to as a DSS. EIS, ESS, geographic information systems (GIS), software agents, knowledge discovery systems, and group DSS can all be called decision support systems (DSS).

A DSS helps a manager retrieve, summarize and analyze decision relevant data. All types of DSS help managers answer questions relevant to a decision situation. The questions may be sophisticated and complex or even somewhat simplistic. A specific DSS may only support operational decision-making or it may support more strategic and long-run decision-making and problem-solving.

Although DSS can provide numerous benefits to managers, even the best DSS will not eliminate "bad" decisions. Realistic expectations for DSS is that they will only support the decision process, not provide the absolute "right" answer.

Decision support systems provide structure to complex situations. Oftentimes, decisions are made based solely on only a few factors, which may provide a poor decision. Only after a thorough analysis of all appropriate factors can the absolute best decision be made. In this situation, a decision support system, if used correctly, can provide the framework necessary for a thorough situational analysis. It is a tool that is flexible enough to be applied in almost any context.

Currently, there is a large market for these decision support systems for various applications in the public and private sectors. Many companies provide computer software that is based on proprietary algorithms, methods, and technology. These are intelligent systems, a blend of mathematical optimization and artificial intelligence, which transform raw data into decision support information. Some examples of the commercial DSS are summarized in Table 14.1.

14.3 Decision Models

Decision models are frequently used as tools to support the decision-making process. The main advantage of using decision models is that the decision models can be analyzed to gain insight and understanding, thereby improving the quality of decision. Decision models may be formulated initially using influence diagrams, showing the controllable and uncertain factors affecting the performance measure. The main disadvantage in using decision models is that the models are dependent on the information provided by the decision-maker. Incorrect or biased information can severely influence the model's outcome. Some examples of decision models are decision trees, flowchart & graphical representation, left-to-right tree-like decision models, and quantitative models.

14.3.1 Decision Trees

The decision tree model in Figure 14.1 is a typical example of the type of model that is often used to help managers make decisions. However, this type of model is inherently flawed because of the subjective binomial response (yes/no-perhaps) required to navigate the decision tree. This model fails to answer the following key questions: how important is each of the factors in weight of the total decision? How strong or weak was the yes or no response to each of the factors? Another problem encountered when using this type of tree is that the sequence of the questions makes each factor very dependent on the prior response.

Another example, Figure 14.2 is used to determine what type of research methods to administer to specific research problems. This is a simple process but is very specific to the needs of the user. The decision tree requires definitive answers to the questions given and does not provide flexibility for answers in between. In other words, the decision model does not account for answers that are less than 100% applicable.

Table 14.1 - Commercial Decision Support Systems

Product Name	Platform	Single License Price	Vendor
Analytica	Mac & Windows	$495	Lumina Decision Systems, Inc.,59 North Santa Cruz Avenue, Suite Q, Los Gatos, CA 95030. Phone: (408) 354-1841. info@lumina.com
DATA	Mac & Windows	$379 Mac $450 Windows	TreeAge Software, Inc., 1075 Main Street, Williamstown, MA 01267. Phone: (413) 458-0104. E-mail: info@treeage.com
Decide	Windows	$295	Software Inventions, Inc., 7400 Hillside Way, Anchorage, AK 99515. Phone: (907) 345-6347.
DecisionPro	PC/Windows 3.1, NT, and 95	$695	Vanguard Software Corporation, 3111 Trellis Green, Cary NC 27511. Phone: (800)538-8173. E-mail: vginfo@vanguardsw.com
DPL	Windows	$995/$495	Applied Decision Analysis, 2710 Sand Hill Road, Menlo Park, CA Phone: (415) 926-9251.
Expression Tree	PC	Free	Prof. Craig Kirkwood, Department of Management, Arizona State University, Tempe, AZ 85287-4006. Phone: (602) 965-6534.
Precision Tree	Windows (Add-in for MS Excel)	$495 Standard $795 Professional	Palisade Corporation, 31 Decker Road, Newfield, NY 14867. Phone: (607) 277-8000. E-mail: sales@palisade.com
Risk Detective	Mac & Windows (Add-in for Excel)	$495 (volume discounts available)	Rhythm Technology, 2824 Wesleyan Lane, Winston-Salem, NC 27106. Tel/Fax: 336-761-0057. E-mail: rhythmte@cris.com
Supertree/Sensitivity	Mac & PC	$1500	Strategic Decision Systems, 2440 Sand Hill Road, Menlo Park, CA 94025. Phone: (415) 854-9000.
TreePlan	Mac & PC	$29 (Shareware)	Decision Support Services, San Francisco, CA 94115. (415) 673-6217.

Figure 14.1 - Research Products Implementation Flowchart
Source: Texas Department of Transportation (TxDOT)

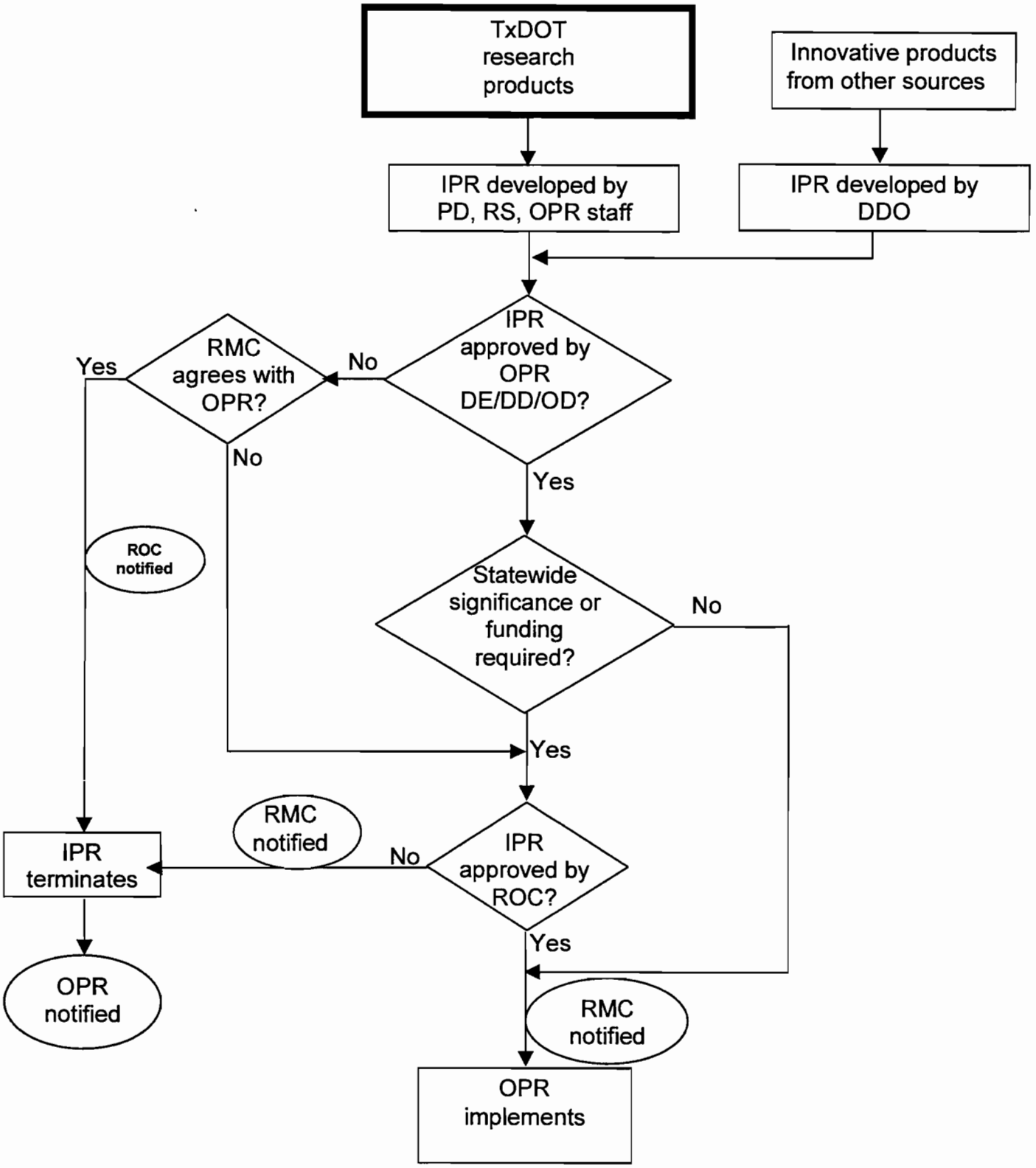
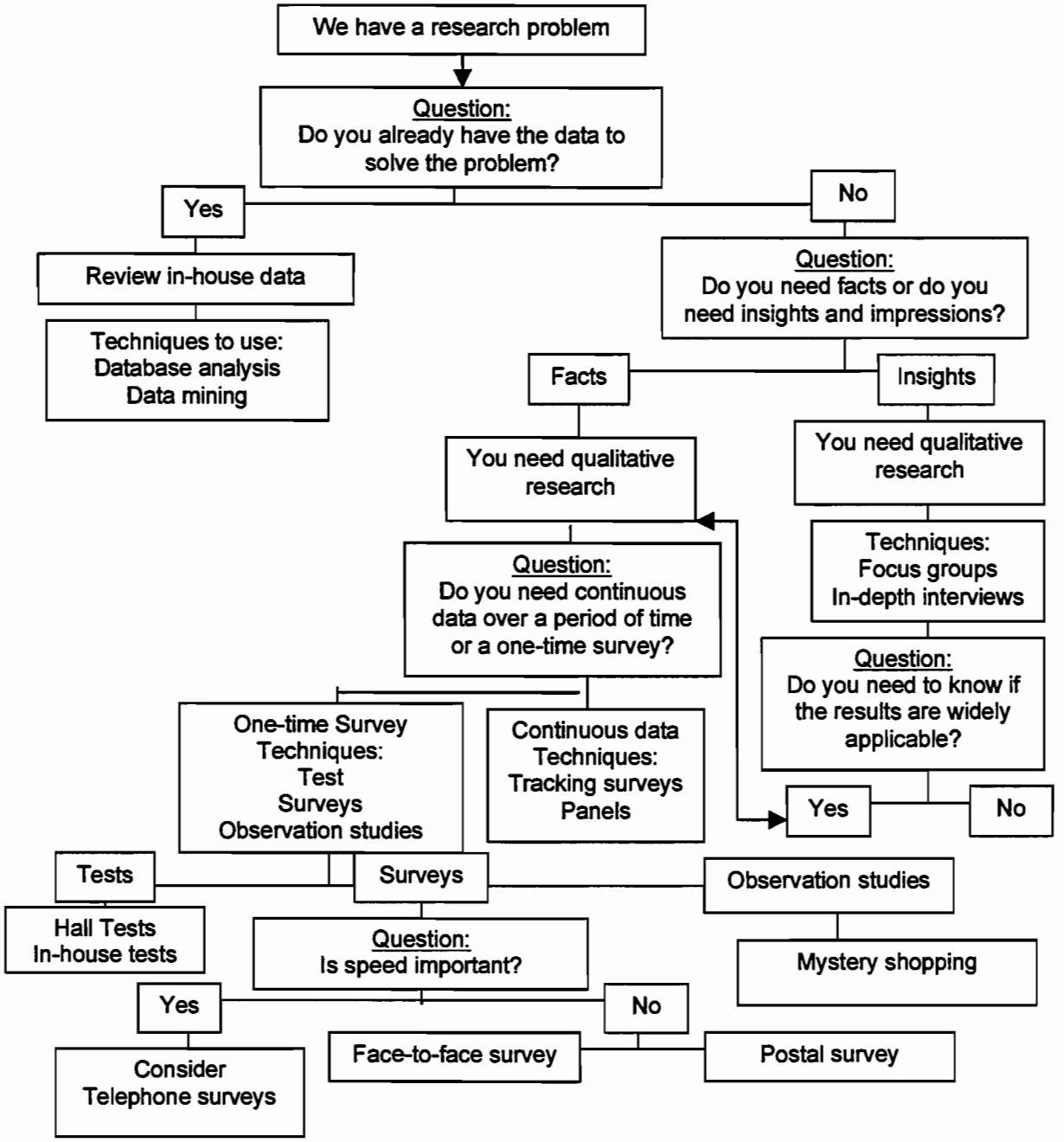


Figure 14.2 - Research Decision Tree
Source: Martin Hamblin



14.3.2 Left-to-Right Tree-Like Decision Models

Left-to-right tree-like decision models are excellent tools for making financial or number-based decisions where a lot of complex information needs to be taken into account. They provide an effective structure in which alternative decisions and the implication of making those decisions can be laid down and evaluated. They also help form an accurate, balanced picture of the risks and rewards that can result from a particular choice. The steps used to develop this type of model are: (1) start a decision tree with a decision that needs to be made; (2) from this box draw out lines towards the right for each possible solution and write the solution along the line; (3) estimate the probabilities of each solution; and (4) calculate the values by using the solutions along with the appropriate probabilities. The left-to-right tree-like decision model in Figure 14.3 begins with the decision to either develop a new product or consolidate products. Each option is pursued along the appropriate lines separately. In this situation, the probabilities and applicable monetary results are determined for the three possible outcomes of each decision. To determine the desired option for the company to pursue, calculations are made by multiplying the probabilities by the monetary result. This method provides the data on all solution possibilities for the company to consider.

14.3.3 Quantitative Models

Business users, application developers and knowledge engineers use quantitative models to capture the knowledge of an organization and create high quality, automated solutions to complex, decision-making problems. Modern quantitative models are called "expert systems." The major difference between the modern technology of expert systems versus classical algorithmic techniques is the ability to develop systems that infer answers from complex and incomplete knowledge bases. Although there are some very powerful expert systems available on the market, they are highly complex, require high maintenance, and an extreme level of understanding in order to implement.

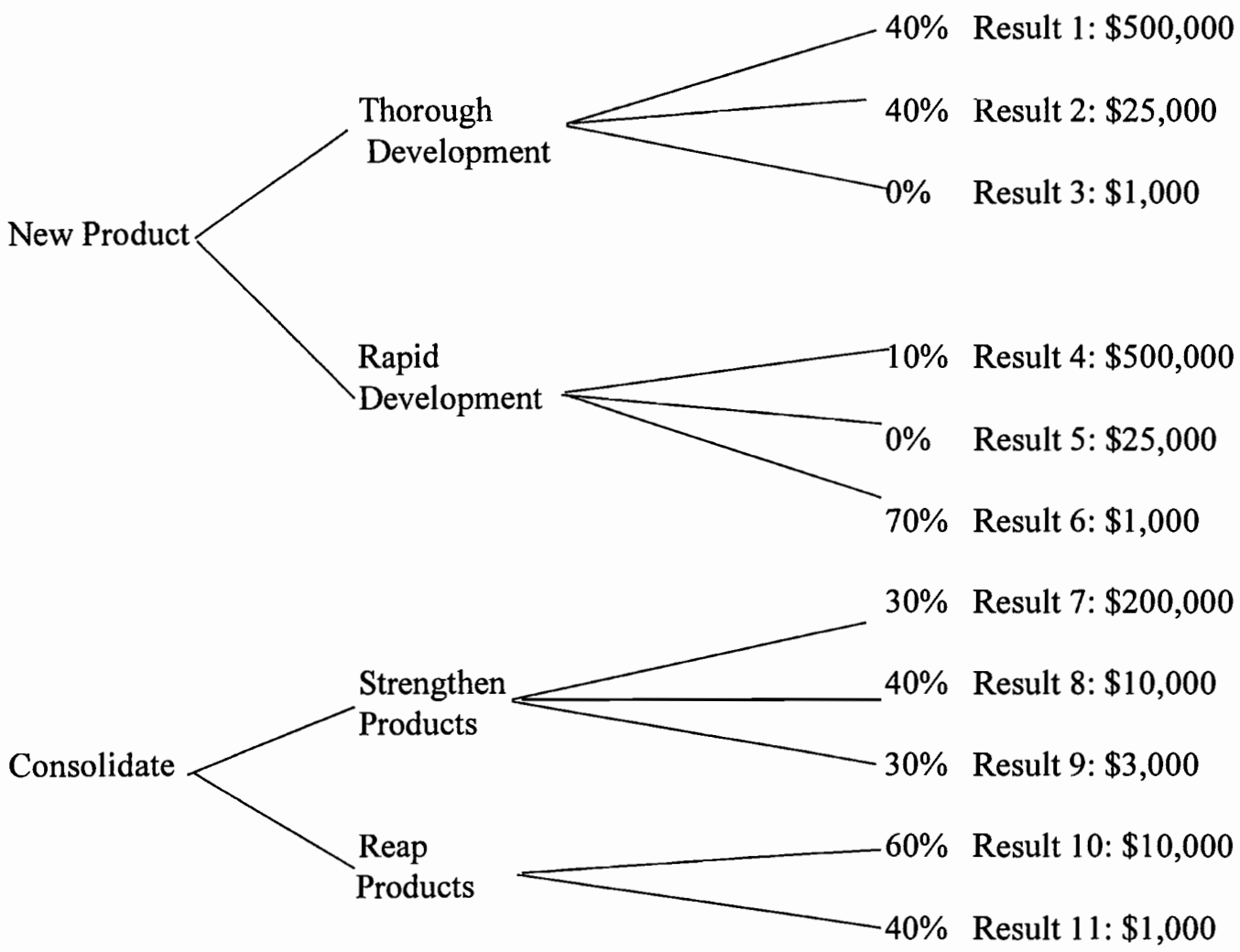
14.4 Primary Requirements of a Useful Functional Outsourcing Decision Model

In order to be successful, the customer (decision-maker) must be considered in the application of the decision model. The benefactor of the model must perceive it as a useful model for implementation. If this is not the case, the decision-maker will not administer the model to its intended extent, which could result in a failed process or even result in the use of another method for the decision-making process. With this in mind, the following are requirements of a useful decision model:

1. Complete accounting for all factors: there are multiple factors that could affect the outsourcing decision, other than just cost consideration. This includes both factors internal (strategic and organizational effectiveness, organizational systems and operations, and human resources and organization culture) and external (external mandates and influences, and vendors) to TxDOT.

2. Simplicity: It is important that all parties involved understand the decision model. When the model is understood, it can be utilized to its maximum potential and the chance for

Figure 14.3 - A Left-To-Right Decision Tree



success is at its greatest. The more complex the model, the more difficult it is to understand and implement the process. The decision-maker and team desire a simple process.

3. Ease of practical application: If this is not achieved, the model will be unsuccessful. The model must be flexible enough to fit any situation. With modern technology, the goal must be to apply the model to a variety of situations with simple implementation to complex problems.

14.5 Example of an Outsourcing Decision Tree from Other DOTs

Figure 14.4 is an illustration of the California Department of Transportation outsourcing decision tree. The intent of the decision tree is to evaluate each major department function to determine whether it should be retained, outsourced, or transferred out. This model only considers: 1) mission of the organization, 2) efficiency/quality/costs, and 3) comparative advantage. The decision-maker utilizes this model each time a department is analyzed.

14.6 The Functional Sourcing Decision Support Model (FSDSM) Proposed by this Research

The model proposed by this research is titled the functional sourcing decision support model (FSDSM). The FSDSM will be explained in the following sections: evaluation factors, the functional assessment questionnaire, a graphical representation, the decision process, and the quantitative model.

14.6.1 Evaluation Factors

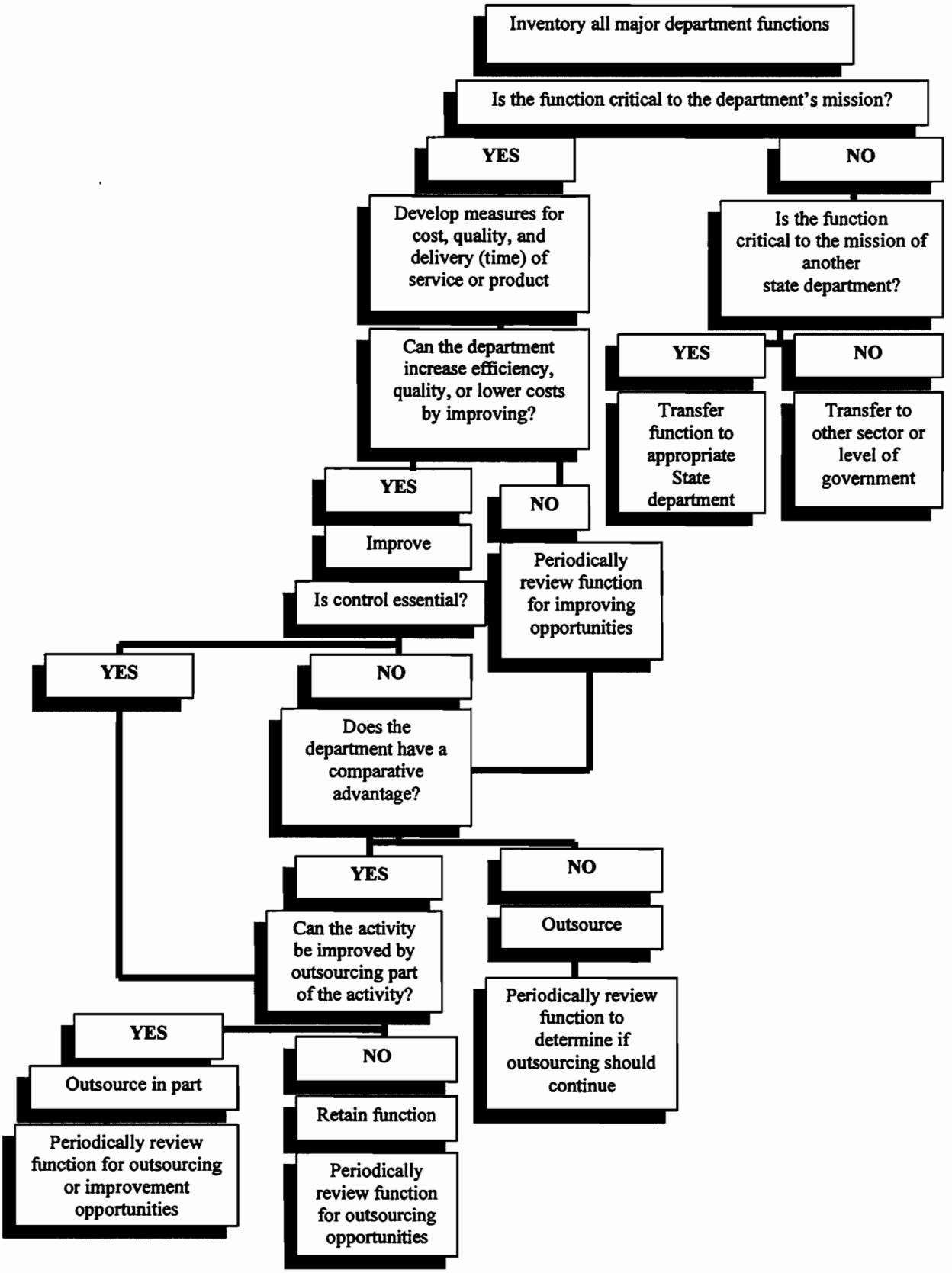
Many factors affect the decision to outsource a function. This outsourcing decision model utilizes the six broad categories of factors: (1) external mandates and influences, (2) strategic and organization effectiveness, (3) organization systems and operations, (4) cost and cost efficiency, (5) human resources and organization culture, and (6) vendors. Each of these categories is composed of a number of subcategories.

External Mandates and Influences: Evaluates any existing or potential external mandates and influences to insource/outsource and the function under study, including all existing or proposed or legal, legislative, regulatory, and/or contractual arrangements. Includes assessment of any existing or potential liability issues relative to insourcing/outsourcing the function under study. Questions that need to be answered that deal with this issue are:

- Are there regulations or laws that would prohibit the organization from outsourcing this function?

- Are there arrangements or contractual agreements with suppliers, customers, or other parties that make it difficult for the organization to outsource this function?

Figure 14.4 - California Decision Tree
Source: California Department of Transportation



- Are there any significant liability problems in outsourcing this function?

Strategic and Organization Effectiveness: Evaluates the strategic importance of the function under study including its criticality to mission accomplishment and its role in establishing and/or sustaining competitive advantage. Assesses the extent to which the function is a core competency of the organization and the effects of insourcing/outsourcing the function. It includes an assessment of:

- Confidentiality requirements of the function
- Insourcing/outsourcing effects on customer service
- The effects of insourcing/outsourcing the function on the quality of production
- The need to gain or retain technology and/or critical skills

Questions that need to be answered that deal with this issue are:

- Is the function a core competency?
- Is the function of such high strategic importance that it is critical to have it insourced in order to accomplish the mission of the organization?
- Does the function deal with such confidential information that it would be detrimental for outsiders to see it?
- Would outsourcing this function result in negative reaction from the general public, the customers, or other stakeholders?
- Would outsourcing this function negatively affect the quality of its output?
- Could contract personnel do this function as well as existing employees?
- Are contractors available who could match the critical technology that is already available in the organization?

Organization Systems and Operations: Assesses the effect of insourcing/outsourcing the function under study on:

- Organization strategy
- Organization systems
- Administrative procedures

- Capacity, volume, scheduling and seasonal variation factors
- Output and productivity
- Inbound and outbound logistics, including inventory and procurement
- Communication and interdependency between and among departments
- Control of the function issues
- Contract management considerations

Questions that need to be answered that deal with this issue are:

- Is this function so interdependent with other functions of the organization that it would negatively affect those other functions?
- Would outsourcing this function negatively impact the organization strategy, systems, or procedures?
- Would outsourcing this function negatively impact the productivity or output of the function?
- Would outsourcing create significant capacity, volume, or scheduling problems?
- Would seasonal fluctuation in this function make it difficult to outsource?

Cost and Cost-Efficiency: Assesses the cost and cost-efficiency of insourcing/outsourcing the function. It includes an assessment of all internal and external, direct and indirect, tangible and intangible, and discretionary and nondiscretionary costs. Includes consideration of the cost, usage and convertibility potential of related equipment and facilities. Questions that need to be answered for this factor include:

- Considering all costs, is it less expensive to insource this function than to outsource it?
- Would outsourcing this function result in greater cost efficiencies to the organization than keeping it in-house?
- Could outside vendors provide this function at significant cost savings to the organization?
- Should this function be kept in-house because of the sizable capital investment the organization has in equipment and/or facilities allocated to this function?

Human Resources and Organization Culture: Assesses the impact of insourcing/outsourcing the function on human resources, organization culture, and the core values of the organization.

Questions that need to be answered in this regard include:

- Would outsourcing this function negatively impact the organization strategy, systems, and or administrative procedures of the organization?
- Would outsourcing this function cause employees to lose faith and loyalty in the organization?
- Would most of the employees who perform this function have to be retrained and relocated to other areas of the organization if this function is outsourced?
- Would outsourcing this function have a negative economic or social impact on employees of the organization?

Vendors: This factor assesses the availability, quality and reliability, actual and potential relations, costs, and cost consistency of vendors.

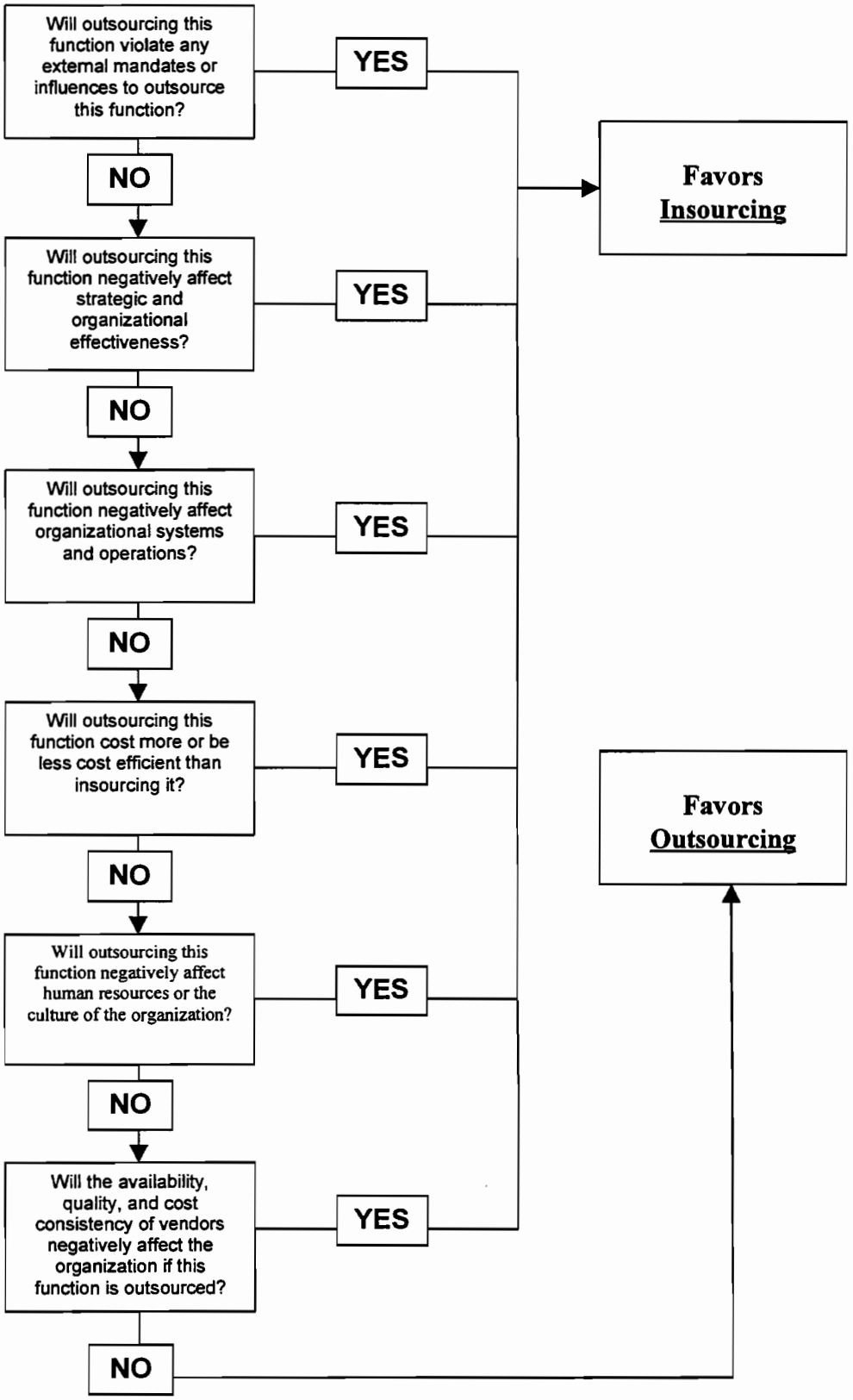
Questions that need to be answered in this regard include:

- Are there a sufficient number of available, quality, and reliable private vendors to outsource this function?
- Would outsourcing this function result in significant vendor-relation problems for the organization?
- If this function is outsourced, would outside vendors raise their prices without cause after the initial contract period?

14.6.2 The Functional Sourcing Decision Flowchart

By using the six factors described above, there are two methods to approach analyzing each business function. The first method is illustrated in the functional sourcing decision flowchart (Figure 14.5). This illustration provides a simple process for the analysis. Each business function is analyzed separately and is processed through the flowchart. The six factors are applied individually with a positive response indicating a propensity to insource or partially outsource, and a negative response indicating a propensity to outsource. Even if there is an external mandate or influence to outsource, for example, insourcing may still be justified because of the negativity of the other factors.

Figure 14.5 - Functional Sourcing Decision Flowchart



14.6.3 The Functional Sourcing Assessment Questionnaire (FSAQ)

The functional sourcing assessment questionnaire (FSAQ, Table 14.2) provides a format for consideration of the facts and issues involved in the functions to be evaluated. As suggested by each of the 30 questions in the FSAQ, team members indicate their level of agreement/disagreement to each statement in the FSAQ with a response between one and five (Strongly Agree = 5, Strongly Disagree = 1). Single or multiple assessments are possible by management or the group.

14.6.4 The Decision Process/Procedure

The functional sourcing decision support system procedure is illustrated in Figure 14.6.

Step 1: The first step is completion of the factor weighting survey. The decision model presented is calculated using Excel 97 for Windows. The factor weighting survey, which is filled out by the decision-maker (strategists and/or upper management) is designed to offset emotional or external influences that frequently occur when discussing an outsourcing decision. This analysis is to be completed in the spirit of the survey's purpose -- that is, to evaluate the importance of the factors in relation to the individual task being evaluated, the organizational environment, and the current situation. This evaluation gives the decision-makers, those ultimately responsible for the consequences of the decision, more stake in the results of the decision model.

After a thorough analysis and consideration of the facts and issues involved in the function to be evaluated as suggested by the factor definitions, management determines the relative importance of the functional sourcing evaluation factors (EFs) by assigning a 0.0 – 1.0 weight to each EF. The sum of the weights for all EFs = 1.0. Some of the EFs may have no implications on the decision and will receive a weight of 0.0.

Step 2: The second step completes a thorough analysis and consideration of the facts and issues involved in the function to be evaluated as suggested by each of the 30 questions in the FSA. The team members indicate their level of agreement/ disagreement to each question. The indication level is between one and five (Strongly Agree = 5, Strongly Disagree = 1). A maximum of three team member responses can be used in the model.

Step 3: The third step uses the results from Step 1 and Step 2. Several calculations are processed in order to determine the final functional sourcing decision index (FSDI) result. The calculations are explained in the Quantitative Model section below.

14.6.5 Quantitative Model

The quantitative model proposed by this research is called the *functional sourcing decision support model* (FSDSM). This model is contained in the MS Excel file "FSDSM.XLS" on the diskette attached to this report and incorporates the three spreadsheets illustrated in Table 14.3, Table 14.4, and Table 14.5 used in the process described above. Tables 14.6, 14.7, and 14.8 show

Table 14.2 - Functional Sourcing Assessment Questionnaire (5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree)

S# **Statement** * read "TxDOT" as below in a *central-office survey instrument*; read "TxDOT" as "this district" in a *district level survey instrument.*

1. This function is a **core competency** of TxDOT and should not be contracted out.
2. This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing our mission.
3. This function deals with **confidential information.** Revealing such information to outside vendors may have a detrimental effect.
4. There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.
5. There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.
6. This function is **interdependent with other functions.** Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.
7. Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.
8. Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.
9. Outsourcing this function results in (would result in) **employees** losing **loyalty and faith** in TxDOT.
10. Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders.**
11. Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas under conditions of outsourcing this function.
12. Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.
13. Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.
14. Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.
15. Outsourcing this function has (would have) a negative **economic or social impact on our current employees.**
16. All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)
17. This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.
18. Outsourcing this function results in (would result in) greater **cost efficiencies** to TxDOT than does in-house performance of this activity.
19. The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.
20. There is a sufficient number of available, quality, and reliable **private vendors** of this function.
21. We anticipate no significant **contract administration** difficulties if this function is contracted out.
22. There are (may be) significant **liability** problems in contracting out this function.
23. Outsourcing this function results in (would result in) **inventory and procurement** problems for TxDOT.
24. Outsourcing this function results in (would result in) significant **vendor-relation** problems.
25. Outside vendors can provide this activity at significant **cost savings** to TxDOT.
26. Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.
27. This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. (Investment means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)
28. Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.
29. This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (Technology means knowledge, information, systems, proprietary processes, hardware, etc.)
30. Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.

the quantitative model in a hypothetical situation, and provides some insight on what can be expected from the analysis. The spreadsheet used for the evaluation factor weights is titled "EFW" and can be found in FSDSM.xls Microsoft Excel file which accompanies this report. The spreadsheet contains the six evaluation factors, the evaluation factor definitions, and three columns for the assigned evaluation importance results. The program can use one, two, or three sets of results for the calculations.

The second step involves the functional sourcing assessment, which is found in survey "FSA" in FSDSM.XLS. This spreadsheet includes 30 functional sourcing statements, three columns for responses, and the final functional sourcing assessment column. Up to three team member responses will be inserted into the columns labeled "FSA".

The final step in this process determines the functional sourcing decision index and can be found in "FSDI" in FSDSM.XLS. This spreadsheet uses the evaluation factor importance results from Step 1 and the functional sourcing assessment results from Step 2. The EFs are taken directly from the "EFI" spreadsheet, but the FSA results are manipulated in the following manner. The questions from the FSA are categorized into the six EFs, as shown below, in order to correlate the two sets of data. The question results are averaged for each EF category to provide the data for the final FSDI calculation. Question results (11, 18, 20, 21, and 25) are reversed for purpose of analysis.

1. External Mandates and Influences (Questions 4, 5, 22)
2. Strategic and Organizational Effectiveness (Questions 1, 2, 3, 10, 13, 17, 29)
3. Organizational Systems and Operations (Questions 6, 8, 12, 14, 19, 21, 23, 28, 30)
4. Cost and Cost Efficiency (Questions 16, 18, 25, 27)
5. Human Resources and Organizational Culture (Questions 7, 9, 11, 15)
6. Vendors (Questions 20, 24, 26)

To obtain the final results from the six categories, the EF results are multiplied by the FSA correlated values. The final six numbers are summed to determine the functional sourcing decision index. If the result is **3.0 or greater**, the results indicate that the task should remain in-house with a strength reflective of how far the mean is away from 3.0. Likewise, if the result is **less than 3.0,** the indication is that the task should be considered for outsourcing with the strength of the indication shown by the distance the mean is from 3.0.

When considering the final result, the decision-makers will have three options: 1) insource the function, 2) outsource the function, or 3) partial outsourcing. Partial outsourcing should be more of a consideration if the result is closer to 3.0, but is always an option no matter the result.

14.7 Concluding Remarks about Outsourcing Decision Support Systems

There is a need in business for an easy-to-use, situational model to determine whether outsourcing is beneficial for specific companies. The method proposed by this research includes not only cost and cost effectiveness, but also numerous other factors ranging from government requirements to vendor

availability. Without this comprehensive approach, not all the important factors would be considered, and the information would be insufficient to make the best decision in a given situation. The method described in this paper successfully satisfies the aforementioned need, and the model provided adheres to the requirements of a useful model outlined previously.

Multiple sources have been cited in the paper from the extensive collection of information available. Because of the emergence of the Internet, information-sharing and access to information has increased dramatically. There is a much greater emphasis on outsourcing because it is becoming more important for organizations to gain competitive advantage. This emphasis can be seen from the volumes of information contained in the References section of this report. The need for outsourcing is increasing every year, which means that the need for an outsourcing decision model is essential.

As the popularity of outsourcing grows, it will become imperative that outsourcing decision-making processes become more rationalized. Therefore, organizations considering outsourcing a function or activity should evaluate all factors and elements. A decision model similar to the one developed here can help to facilitate this decision-making process.

Figure 14.6 - Functional Sourcing Decision Procedure

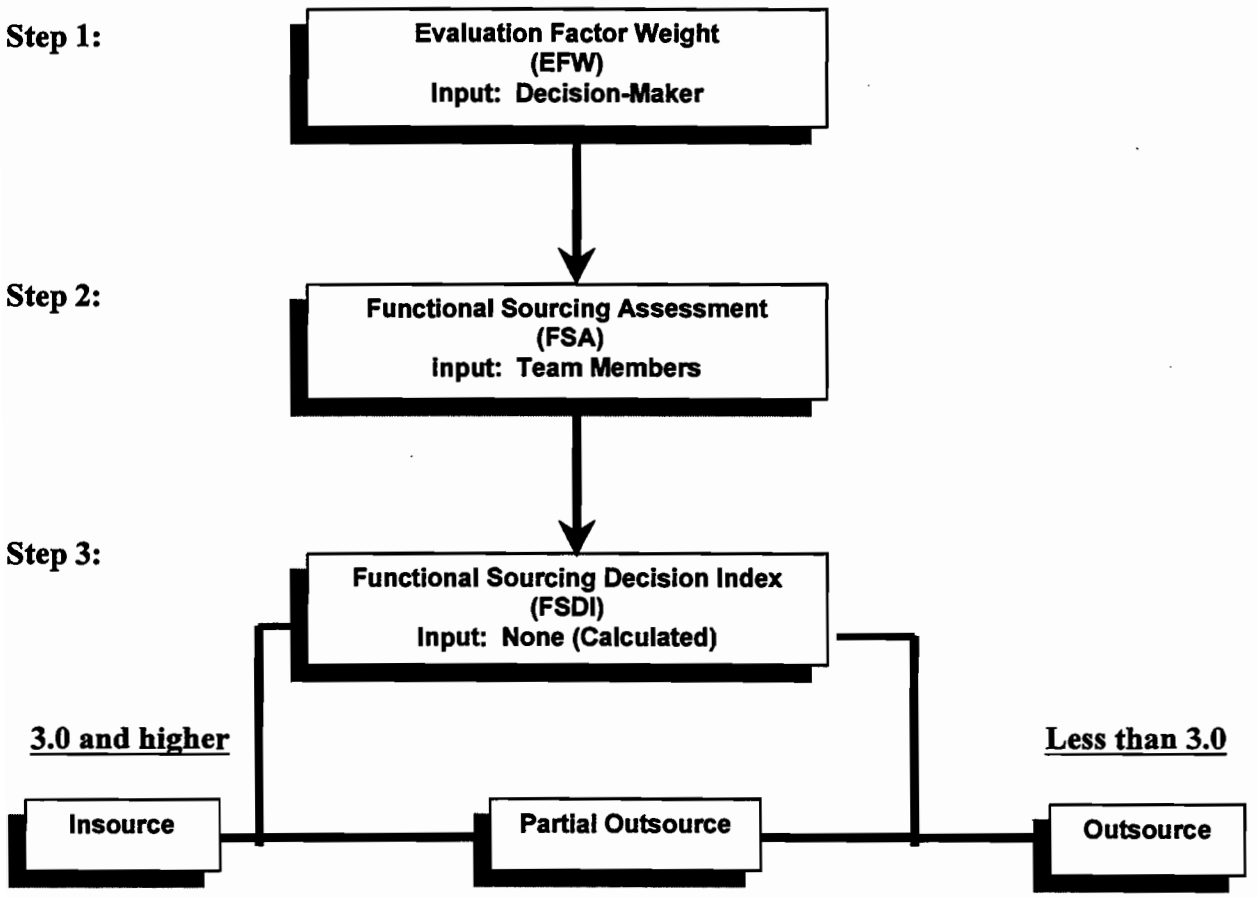


Table 14.3 - Functional Sourcing Decision Support Model (FSDSM) Worksheet 1 - Evaluation Factor Weights (EFW)

* Indicate the relative weight (importance) of each factor in evaluation by assigning a value of 0.00 - 1.00 to each factor. COLUMN TOTALS MUST EQUAL 1.00.						
** Automatically calculated values. EFW is the average Evaluation Factor Weight for Assessors (A) 1, 2, & 3.						
F#	Evaluation Factor Name	Evaluation Factor Definition	A 1*	A 2*	A 3*	EFW**
1	External Mandates and Influences	This factor evaluates existing or potential **external mandates and influences** to insource/outsource the function under study, including all existing or proposed **legal, legislative, regulatory,** and/or **contractual arrangements** relative to the function under study. Also evaluates any existing or potential **liability issues** relative to insourcing/outsourcing the function under study.				
2	Strategic and Organization Effectiveness	This factor evaluates the strategic importance of the function under study including its **criticality to mission accomplishment** and its **role in establishing and/or sustaining competitive advantage.** Evaluates the **extent to which the function is a core competency** of the organization and the subsequent effects of insourcing/outsourcing the function under study thereon. Includes an evaluation of the **confidentiality requirements** of the function; insourcing/outsourcing **effects on customer service;** and the effects of insourcing/outsourcing the function on the **quality of production.** This factor also evaluates **the need to gain or retain technology and/or critical skills** through insourcing/outsourcing.				
3	Organizational Systems and Operations	This factor evaluates **the effect** of insourcing/outsourcing the function under study on: **organization strategy; organization systems; administrative procedures; capacity, volume, scheduling and seasonal variation factors; output and productivity; inbound and outbound logistics including inventory and procurement; communication and interdependency between and among departments; control of the function issues; and contract management considerations.**				
4	Cost and Cost Efficiency	This factor evaluates the **cost and cost efficiency** of insourcing/outsourcing the function under study, including all **internal and external, direct and indirect, tangible and intangible, and discretionary and non-discretionary transaction costs.** Includes a consideration of the **cost, usage and convertibility potential of related equipment and facilities.**				
5	Human Resources and Organization Culture	This factor evaluates the **impact** of insourcing/outsourcing the function under study **on human resources, organization culture, and the core values of the organization.**				
6	Vendors	This factor evaluates the **availability, quality and reliability, actual and potential relations, cost, and cost consistency of vendors (suppliers)** relative to insourcing/outsourcing the function under study.				
		Total				

Table 14.4 - Functional Sourcing Decision Support Model (FSDSM) Worksheet 2 - Functional Sourcing Assessment (FSA)

	Evaluate each of the following statements using 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree				
* Input 1-5 whole numbers indicating Agreement/Disagreement as above for 1-3 individual/group assessors.					
* Automatically calculated values. FSA is the average Functional Sourcing Assessment for Assessors (A) 1, 2 & 3.					
S#	**Statement**	**A1***	**A2***	**A3***	**FSA****
1	This function is a **core competency** of TxDOT and should not be contracted out.				
2	This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing the mission of TxDOT.				
3	This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect on TxDOT.				
4	There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.				
5	There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.				
6	This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.				
7	Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.				
8	Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.				
9	Outsourcing this function results in (would result in) **employee** losing **loyalty and faith** in TxDOT.				
10	Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders**.				
11	Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas of TxDOT under conditions of outsourcing this function.				
12	Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.				
13	Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.				
14	Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.				
15	Outsourcing this function has (would have) a negative **economic or social impact on our current employees**.				
16	All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)				
17	This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.				
18	Outsourcing this function results in (would result in) greater **cost efficiencies** to the company than does in-house performance of this activity.				
19	The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.				
20	There is a sufficient number of available, quality, and reliable **private vendors** of this function.				
21	We anticipate no significant **contract administration** difficulties if this function is contracted out.				
22	There are (may be) significant **liability** problems in contracting out this function.				
23	Outsourcing this function results in (would result in) **inventory and procurement** problems for the company.				
24	Outsourcing this function results in (would result in) significant **vendor-relation** problems.				
25	Outside vendors can provide this activity at significant **cost savings** to TxDOT.				
26	Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.				
27	This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. ("Investment" means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)				
28	Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.				
29	This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (" Technology" means knowledge, information, systems, proprietary processes, hardware, etc.)				
30	Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.				

Table 14.5 - Functional Sourcing Decision Support Model (FSDSM) Worksheet 3 - Functional Sourcing Decision Index (FSDI)

* All values on this sheet are calculated from previously completed EFW & FSA evaluations/assessments.				
Evaluation Factor Number	**Evaluation Factor Name**	**Evaluation Factor Weight (EFW)**	**Functional Sourcing Assessment (FSA)**	**Adjusted Factor Assessment**
1	External Mandates and Influences			
2	Strategic and Organization Effectiveness			
3	Organizational Systems and Operations			
4	Cost and Cost Efficiency			
5	Human Resources and Organization Culture			
6	Vendors			
	Total Factor Importance	0.00		
			Functional Sourcing Decision Index (FSDI) =	-

Table 14.6 - Functional Sourcing Decision Support Model (FSDSM) Worksheet 1 Sample - Evaluation Factor Weights (EFW)

* Indicate the relative weight (importance) of each factor in evaluation by assigning a value of 0.00 - 1.00 to each factor. COLUMN TOTALS MUST EQUAL 1.00.						
** Automatically calculated values. EFW is the average Evaluation Factor Weight for Assessors (A) 1, 2, & 3.						
F#	**Evaluation Factor Name**	**Evaluation Factor Definition**	**A 1***	**A 2***	**A 3***	**EFW****
1	**External Mandates and Influences**	This factor evaluates existing or potential **external mandates and influences** to insource/outsource the function under study, including all existing or proposed **legal, legislative, regulatory,** and/or **contractual arrangements** relative to the function under study. Also evaluates any existing or potential **liability issues** relative to insourcing/outsourcing the function under study.	**0.50**	**0.10**	**-**	**0.20**
2	**Strategic and Organization Effectiveness**	This factor evaluates the strategic importance of the function under study including its **criticality to mission accomplishment** and its **role in establishing and/or sustaining competitive advantage.** Evaluates the **extent to which the function is a core competency** of the organization and the subsequent effects of insourcing/outsourcing the function under study thereon. Includes an evaluation of the **confidentiality requirements** of the function; insourcing/outsourcing **effects on customer service**; and the effects of insourcing/outsourcing the function on the **quality of production.** This factor also evaluates **the need to gain or retain technology and/or critical skills** through insourcing/outsourcing.	**0.15**	**0.20**	**0.25**	**0.20**
3	**Organizational Systems and Operations**	This factor evaluates **the effect** of insourcing/outsourcing the function under study on: **organization strategy; organization systems; administrative procedures; capacity, volume, scheduling and seasonal variation factors; output and productivity; inbound and outbound logistics including inventory and procurement; communication and interdependency between and among departments; control of the function issues; and contract management considerations.**	**0.20**	**0.10**	**0.05**	**0.12**
4	**Cost and Cost Efficiency**	This factor evaluates the **cost and cost efficiency** of insourcing/outsourcing the function under study, including all **internal and external, direct and indirect, tangible and intangible, and discretionary and non-discretionary transaction costs.** Includes a consideration of the **cost, usage and convertibility potential of related equipment and facilities.**	**0.15**	**0.50**	**0.40**	**0.35**
5	**Human Resources and Organization Culture**	This factor evaluates the **impact** of insourcing/outsourcing the function under study **on human resources, organization culture, and the core values of the organization.**	**-**	**0.05**	**0.20**	**0.08**
6	**Vendors**	This factor evaluates the **availability, quality and reliability, actual and potential relations, cost, and cost consistency of vendors (suppliers)** relative to insourcing/outsourcing the function under study.	**-**	**0.05**	**0.10**	**0.05**
		Total	**1.00**	**1.00**	**1.00**	

Table 14.7 - Functional Sourcing Decision Support Model (FSDSM) Worksheet 2 Sample - Functional Sourcing Assessment (FSA)

	Evaluate each of the following statements using 5 = Strongly Agree; 4 = Agree; 3 = Neutral; 2 = Disagree; 1 = Strongly Disagree				
* Input 1-5 whole numbers indicating Agreement/Disagreement as above for 1-3 individual/group assessors.					
* Automatically calculated values. FSA is the average Functional Sourcing Assessment for Assessors (A) 1, 2 & 3.					
S#	Statement	A1*	A2*	A3*	FSA**
1	This function is a **core competency** of TxDOT and should not be contracted out.	4	3	5	4.00
2	This function is of high **strategic importance** to TxDOT and its performance in-house is critical to accomplishing the mission of TxDOT.	2	3	4	3.00
3	This function deals with **confidential information**. Revealing such information to outside vendors may have a detrimental effect on TxDOT.	5	3	4	4.00
4	There are **regulations or laws** that would prohibit TxDOT from outsourcing this function.	3	2	4	3.00
5	There are **arrangements or contractual agreements** with suppliers, customers, or other parties that make it difficult for TxDOT to outsource this function.	2	3	2	2.33
6	This function is **interdependent with other functions**. Outsourcing this function negatively impacts (would negatively impact) effective interaction within TxDOT.	3	5	4	4.00
7	Outsourcing this function negatively impacts (would negatively impact) the **culture or organizational values** of TxDOT.	4	3	2	3.00
8	Outsourcing this function negatively impacts (would negatively impact) the **organization strategy, systems, and/or administrative procedures** of TxDOT.	2	3	3	2.67
9	Outsourcing this function results in (would result in) **employee** losing **loyalty and faith** in TxDOT.	2	1	2	1.67
10	Outsourcing this function results in (would result in) a negative **reaction from the general public, customers, or other stakeholders**.	1	1	4	2.00
11	Most of the **employees** who currently perform this function in-house have been (would be) **retrained and relocated** to other areas of TxDOT under conditions of outsourcing this function.	5	1	4	3.33
12	Contracting out this function negatively impacts (would negatively impact) the **productivity or quantity of output** of this function.	2	4	2	2.67
13	Contracting out this function negatively affects (would negatively affect) the **quality of output** of this function.	3	2	4	3.00
14	Outsourcing this function would result in significant **capacity, volume, or scheduling** problems in TxDOT.	3	2	1	2.00
15	Outsourcing this function has (would have) a negative **economic or social impact on our current employees**.	1	3	1	1.67
16	All costs considered, insourcing this function **costs** less than outsourcing it. ("All costs" means the net sum of all actual & potential, internal & external, direct & indirect, tangible & intangible, discretionary & nondiscretionary transaction costs of this function.)	2	3	4	3.00
17	This function should be performed in-house because the **critical human resource skills** in this activity cannot be matched by external vendors.	4	4	5	4.33
18	Outsourcing this function results in (would result in) greater **cost efficiencies** to the company than does in-house performance of this activity.	1	4	5	3.33
19	The **seasonal fluctuation** of activity in this function makes it difficult to outsource this function.	1	4	4	3.00
20	There is a sufficient number of available, quality, and reliable **private vendors** of this function.	5	2	4	3.67
21	We anticipate no significant **contract administration** difficulties if this function is contracted out.	2	4	3	3.00
22	There are (may be) significant **liability** problems in contracting out this function.	3	3	2	2.67
23	Outsourcing this function results in (would result in) **inventory and procurement** problems for the company.	2	3	2	2.33
24	Outsourcing this function results in (would result in) significant **vendor-relation** problems.	4	3	3	3.33
25	Outside vendors can provide this activity at significant **cost savings** to TxDOT.	4	3	4	3.67
26	Outside vendors may (do) **raise** their **prices** without cause after the initial contract period under conditions of outsourcing this function.	1	3	3	2.33
27	This function should not be outsourced because of the sizable **capital investment** we have in equipment and/or facilities allocated to this function. ("Investment" means cost, usage, and actual/potential convertibility of equipment and facilities, etc.)	2	4	3	3.00
28	Outsourcing this function results in (would result in) significant new **tasks and responsibilities** for TxDOT.	5	5	3	4.33
29	This function should be performed in-house because of **critical technology** we have in this activity that cannot be matched by external vendors. (" Technology" means knowledge, information, systems, proprietary processes, hardware, etc.)	5	4	4	4.33
30	Outsourcing this function makes it (would make it) difficult to maintain **control** of this activity.	4	2	4	3.33

Table 14.8 - Functional Sourcing Decision Support Model (FSDSM) Worksheet 3 Sample - Functional Sourcing Decision Index (FSDI)

* All values on this sheet are calculated from previously completed EFW & FSA evaluations/assessments.				
Evaluation Factor Number	**Evaluation Factor Name**	**Evaluation Factor Weight (EFW)**	**Functional Sourcing Assessment (FSA)**	**Adjusted Factor Assessment**
1	External Mandates and Influences	0.20	2.7	0.53
2	Strategic and Organization Effectiveness	0.20	3.5	0.70
3	Organizational Systems and Operations	0.12	3.0	0.35
4	Cost and Cost Efficiency	0.35	2.8	0.96
5	Human Resources and Organization Culture	0.08	2.3	0.19
6	Vendors	0.05	2.7	0.13
	Total Factor Importance	1.00		
			Functional Sourcing Decision Index (FSDI) =	2.88

SECTION 15.0

RECOMMENDED APPROACHES TO VENDOR EVALUATION AND PARTNERING WITH SUPPLIERS

15.1 Vendor Evaluation Factors

In selecting a vendor for one or more functions of an entity, management should follow a procedure that includes considerations of key strengths of a vendor the possible risks involved. Vendor strengths mean the benefits that the vendor brings to the operations, their core competencies, and operational capabilities. Risks involved in an outsourcing situation refers to the possibility that the vendor does not live up to the expectations and the outsourcing organization has to deal with the possible consequences. The following generic set of factors have been found to be useful in evaluating vendor strengths. Inherent in each is a consideration of vendor risk.

15.1.1 *Availability*

A vendor should be able to provide uninterrupted service to the outsourcing firm. This ability will be dependent on the vendor's operational capabilities and its financial strength. In case the vendor is unable to provide uninterrupted supply of product or service, the outsourcing firm stands to lose its customer base and customer goodwill.

15.1.2 *Interest*

The selected vendor should have sufficient interest in the functions that are to be outsourced. This interest can be determined by the subject experience of the vendor, membership in industry organizations, and customer base. A noninterested vendor may bid at the outset but due to lack of interest in the business may end up providing less than adequate service over the life of the contract. This disinterest can lead to product deficiencies and loss of customer goodwill.

15.1.3 *Company History*

The first and foremost should be a company's record of accomplishment. If the company has been in business for some time, one can get information about that company from industry-specific magazines and trade associations. If a company does not have a long history, then it may not have enough experience for handling an outsourcing job. This inexperience may result in unrealistic optimism on part of the vendor, which may lead to operational troubles at a later time.

15.1.4 *Industry Organization Member*

A vendor's membership in an industry organization lends credibility of operational capability. Any industry organization membership should be looked at as a plus in a vendor's portfolio of competencies. A vendor who is not a member of its industry organization may not have sufficient

information to keep itself up-to-date on the new technologies available to improve its operations. This can lead to loss of competitive edge if a competitor switches to new technologies and is able to produce a lower cost or a functionally better product.

15.1.5 *Technology*

The vendor should have technologically adequate equipment and facilities to perform the outsourced functions. At the very least, the vendor should have the same or similar technology as the outsourcing firm. If the vendor is unable to provide technologically sound operations, the outsourcing firm will experience lack of quality and performance in the outsourced service.

15.1.6 *Financial Strength/Stability*

Financial strength and stability are important vendor evaluation factors. Such consideration identifies areas of weakness and vendor operational capabilities. In case it is a public company, financial information can often be obtained from the Securities Exchange Commission. If the vendor is a privately held company, limited financial information can be obtained from trade journals and financial information sources such as Standard and Poors. A bad or troubled financial record may indicate operational difficulties faced by the vendor. This sort of record may result in a lack of ability to see the outsourcing contract through, and may result in disruption of service in case of bankruptcy or liquidation.

15.1.7 *Subject Experience/Track Record*

Besides having strong financial base and a reputable operating history, the company should have adequate and sufficient subject experience. This factor is especially important in the case of industries that require specific licensing to handle jobs. Subject experience can be gauged by reviewing the company's work exposure to like jobs, experience of personnel on like jobs, number of clients being served on similar jobs, and the company's employee turnover rate. The record of accomplishment can be gauged by contacting existent and past customers of the vendor. A vendor may not have sufficient experience, which will lead to higher learning curve. This steeper learning curve may result in quality problems and may result in delays in operations.

15.1.8 *Cost*

Cost is an important quantitative factor in evaluating and selecting a vendor. The vendor should meet all of the other requisites and provide the lowest bid. The outsourcing organization should make a cost estimate, and all bids received should be compared to this estimate. This estimate will give the outsourcer a better idea about how realistic a bid is, and will also help the outsourcer get a better feel for estimating in the future. The risk associated with accepting a bid based only on cost is ever present. A decision for outsourcing needs to look into the bids offered and try to judge if a bid price looks too good to be true. This judgement can be achieved by using an experience-based estimate matched to the bid price(s).

15.1.9 *Quality/Performance*

Quality is one of the most important qualitative factors. A complete study should be performed of all quality requirements. Vendor operational efficiency and effectiveness play a significant role in assuring quality of product or service desired. Quality control at the output level should be part of the total quality assurance, which involves operational capabilities. This criteria can be satisfied by professional and industry certification of operations. Quality needs to be assured by the vendor for the life of the contract. The outsourcer needs to make sure that it takes proactive measures to assure consistent quality product or service. The outsourcing firm can be at a disadvantage if it does not perform a periodic quality review by means of asking the vendor to have a quality audit or an ISO certification.

15.1.10 *Knowledge of the Industry*

Vendor knowledge is essential to make sure that the product or service being outsourced is received without disruption. Industry knowledge will help the vendor anticipate peak times of product or service performed and will help the vendor plan for such times. Inadequate knowledge of the industry can lead to delivery delays on part of the vendor. The vendor will have a bigger experience curve and thus may end up hurting the services of the outsourcer to its customers.

15.1.11 *Scope of Service*

Scope of service should be defined to the vendor at the outset. Specifically, scope of service should be clearly spelled out in the call for bids. The vendor's industry and subject experience will determine the scope of services that the vendor firm can be realistically expected to perform. If scope of services is not defined and clearly stated at the start of the vendor-outsourcer agreement, the outsourcing firm can experience difficulties in meeting its future needs.

15.1.12 *Support Availability*

A vendor should be able to provide as-needed and when-needed service support. If operations are 24/7, for example, then the support service should also be available for all function-critical operations. A vendor with support personnel and parts (storage) near the area of operations should be preferred. Inadequate support services provided by the vendor will lead to disruption in services and will ultimately lead to unsatisfied customers. Significant time delays can also result in work stoppages that can cost the outsourcing company in terms of unproductive labor and facilities.

15.1.13 *Backup/Contingency Planning/Hot Site*

A vendor should have adequate backup personnel and facilities in case of a natural or human-induced disaster. This capability will ensure nondisruptive availability of service. Any unforeseen calamity should result in minimal delays of operations. The loss of production facility by the vendor can lead to total disruption of supply to the outsourcing company. A lack of backup facilities, contingency

planning, or a hot site (parallel processing location) will lead to incapability on part of the vendor to supply the product or service agreed upon.

15.1.14 *Facilities*

A vendor's facilities should be physically and functionally adequate and reasonable. All facilities should be certified by all of the relevant agencies (fire marshal, building authorities, etc.). All facilities should also have good security measures. Inadequate facilities may lead to closure of such facilities by the regulatory agencies. This closure condition will often lead to disruption of services by the vendor to the outsourcing company.

15.1.15 *Contract Adjustments*

A vendor should be reasonable as to contract adjustments. In case of unforeseen circumstances, such as obsolescence or abnormality, the outsourcing firm should be able to adjust the contract to better function in such times. The absence of contract adjustment clauses in the case of unforeseen circumstances will lead to insufficient or irrelevant supply of product or service by the vendor to the outsourcing organization.

15.1.16 *ISO Compliant*

If the outsourced operation is of a manufacturing nature or is somehow covered by ISO requirements, the vendor for such outsourcing agreements should also be ISO compliant. The vendor has to be an ISO compliant if the company outsourcing its function(s) is an ISO compliant. If the vendor is not ISO compliant, then this noncompliance may lead to quality issues later.

15.1.17 *Audit/ Quality Review*

A vendor should have independent review or audit of its operations. This review can be a financial audit/review and a review of operations such as a quality review (ISO etc.). Nonaudited or nonreviewed operations can lead to doubts about reliability of the operational and financial capability of the vendor. Nonauditing can create trouble if the vendor is fined by a regulatory agency for a problem that existed at the time of signing the outsourcing contract.

15.1.18 A Vendor Selection Decision Approach

An approach to selecting vendors that accounts for all the factors in the previous section is shown in Table 15.1. All factors are assigned criticality points from 1-100. For example, cost is assigned 90 points and company history is assigned 20 points. This rating means that the company deems that cost quoted by a vendor is theoretically more important than the vendor's company history.

After all applicable factors are assigned criticality points, all points are added that results in a total score for all factors (1095 in this example). Each factor's criticality is divided by the total score,

which yields that factor's weight. Then multiply the weight by a rating given to each factor for each vendor (in this case, 5 = Superior, 4 = Above Average/Good, 3 = Average, 2 = Below Average, 1 = Unacceptable). This equation results in the score for that factor. Adding all scores results in a total score for that vendor. This process is repeated for all vendors. The one with the highest score should be selected. In the event that there are two or more vendors whose total score is close, judgmental select the vendor or reassign some criticality points just for the vendors who are close. An organization may also set a certain score as a floor for vendor selection, e.g., any vendor who scores under a 3.0 is ineligible.

Table 15.1 - Vendor Selection Decision Model

Factor #	Applicable Factors	Points	Weight	Rating*	Score
1	Availability	70	0.064	4	0.256
2	Interest	70	0.064	5	0.320
3	Company History	20	0.018	4	0.073
4	Industry Organization Member	40	0.037	3	0.110
5	Technology	100	0.091	5	0.457
6	Financial Strength/Stability	50	0.046	5	0.228
7	Subject Experience/Track Record	60	0.055	5	0.274
8	Cost	90	0.082	3	0.247
9	Quality/Performance	90	0.082	4	0.329
10	Knowledge of the Industry	70	0.064	3	0.192
11	Scope of Services	80	0.073	4	0.292
12	Support Availability	95	0.087	5	0.434
13	Backup/Contingency/Hot Site	50	0.046	3	0.137
14	Facilities	50	0.046	3	0.137
15	Contract Adjustments	60	0.055	3	0.164
16	ISO Compliant	50	0.046	4	0.183
17	Audit/Quality Review	50	0.046	3	0.137
	Totals	**1095**	**1.000**		**3.968**

* Rating: 5 = Superior, 4 = Above Average/Good, 3 = Average, 2 = Below Average, 1 = Unacceptable

15.2 Partnering With Suppliers

Partnership is a tailored business relationship based on mutual trust, openness, shared risk and shared rewards that yields a competitive advantage, resulting in business performance greater than would be achieved by the firms individually (Ellram, 1995). Partnering may be among competitors or noncompetitors and may exist for strategic or operational reasons (Leenders and Fearon, 1993). Although all partners share basic attributes of a mix of features and of markets, they come in a myriad of different structure forms. These different structures affect the pattern of decision-making and the control of capabilities (Gomes-Casseres, 1996). Licensing relationship, joint R&D programs, co-marketing programs, partial equity investments and the relationship between a buyer and supplier of an intermediate product are all examples of partnering (Gomes-Casseres, 1996).

In partnering, individual member firms can specialize in parts of the business so that the group as a whole can attain a higher level of performance. Moreover, firms seeking to catch up with industry leaders use partnering to acquire new capabilities and to learn faster. For example, computer firms like Fujitsu and Amdahl used partnerships to close the gap with IBM. Later, when IBM lost its dominance –owing largely to a change in the technological context – they started using partnering to complement their internal capabilities.

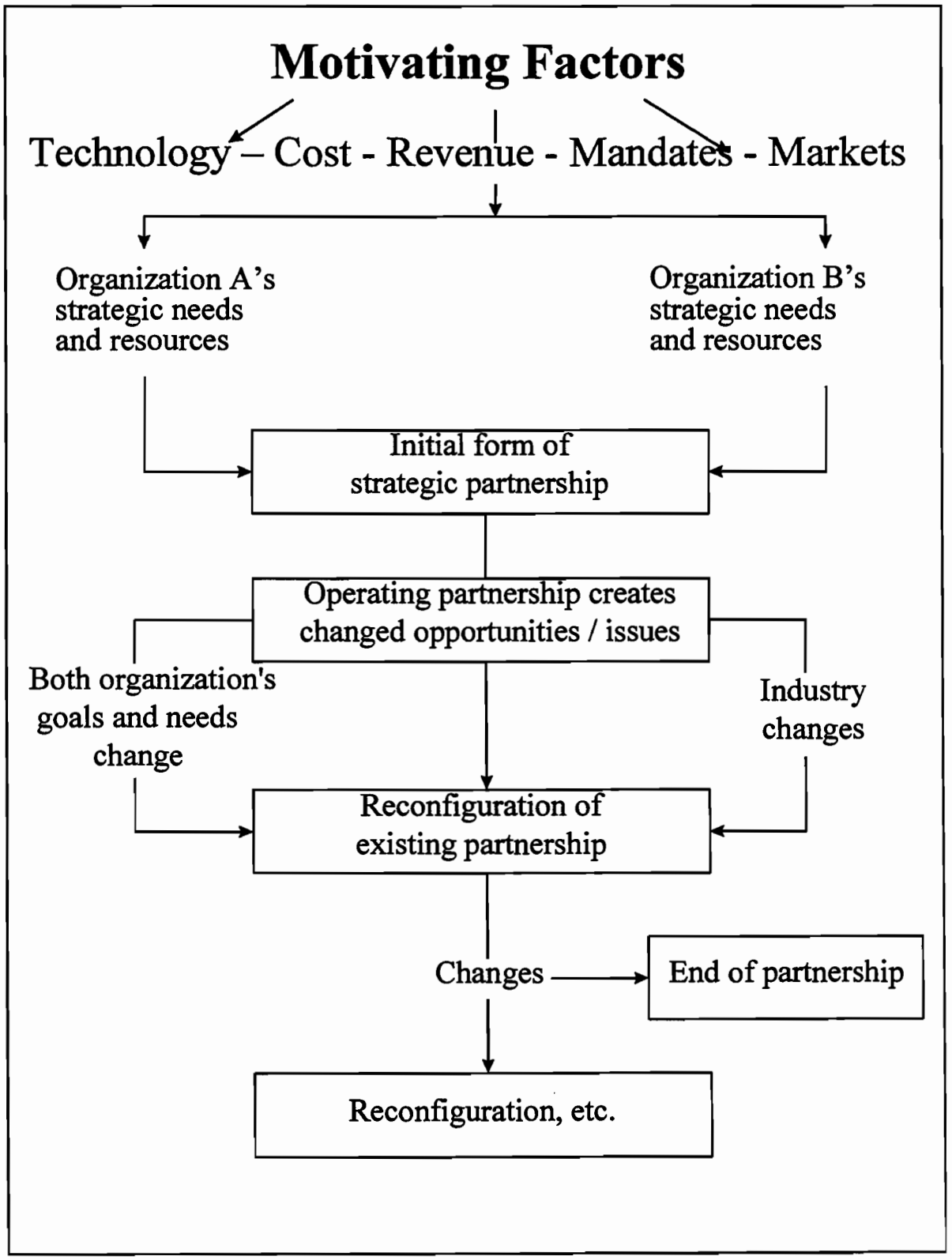
Another advantage is that the firms can assemble new capabilities quickly by forming new partnerships and can develop new capabilities more quickly and cheaply by learning from partners. However, partners often achieve this flexibility at the cost of split control and some loss of coordination (Gomes-Casseres, 1996).

A buyer-supplier partnership is not the same as a strategic alliance, which normally entails some degree of shared ownership across the two parties, nor is it the same as vertical integration. While most partnerships share some common elements and characteristics, there is no one ideal or "benchmark" relationship that is appropriate in all situations. Each relationship has its own set of motivating factors, as well as its own unique operating environment. The duration, breadth, strength, and closeness of the partnership will vary from case to case and over time (Leenders & Fearon, 1993). The strategic partnership process is depicted in Figure 15.1.

By definition, a partnership relationship is a mutual relationship, involving the mutual exchange of ideas, information, and benefits. The idea of developing partnering with suppliers originated by observing Japanese automobile companies. In Japan, the automobile companies form partnership alliance with suppliers in order to obtain raw materials and intermediaries at target prices. In Japan, such buyer-supplier partnership was cited as the main cause for achieving high quality, on-time delivery, better price, and continuous process improvement.

A buyer-supplier relationship is also important in maintaining the strategic leadership of an organization. The buyer-seller partnership relationship will be advantageous to both buyer and seller without sacrificing each other's independence and identity. It will be a "win-win" situation where both the buyer and seller will grow together by helping each other, sharing risk, information,

Figure 15.1 - Strategic Partnership Process



technology, knowledge, and capital to maintain growth and profitability. These relationships generally exist in order to improve operating procedures and efficiency; thus they are classified as cooperative arrangements to the extent relationships exist to develop new products and/or new technologies, the relationship may go beyond cooperation to include collaboration (Ellram, 1995).

Specific benefits of buyer-seller partnering with respect to buyer include:

- an assured continuous supply of raw materials and intermediaries,
- the seller is obligated to assure supply at any condition,
- price stability,
- quality assurance,
- sharing of technological breakthrough,
- assured continuous improvement, and
- early involvement in new product development.

Benefits of buyer-seller partnering with respect to sellers include:

- an assured market,
- price stability,
- reduction of costs associated with selling,
- help in process improvements in maintaining quality and price, and
- opportunities in additional business by involving buyer in new product development.

Following factors have been identified as elements for a successful partnership:

- communications,
- early warning,
- joint operating controls,
- risk/reward sharing,
- trust and commitment to each other's success,
- contract style (time frame and coverage),
- scope (share partner's business, value added, and critical activities), and
- investment (financial, technology, and people). (Lambert, et al, 1998)

Partnership is an arrangement for mutual benefits and is based on trust and cooperation. Therefore, it is important to make sure that both parties are benefitted from the alliance (Ellram, 1995). Research indicated that the most important factor contributing to the failure of a partnership alliance is poor communication between the partners. Other factors contributing to failure are a lack of trust, poor up-front planning, and a lack of shared goals.

15.2.1 Guidelines for Developing and Implementing Partnerships

A five-phased model has been proposed to form purchasing partnerships and later applied successfully at Eastman Kodak Company in developing buyer-supplier partnerships (Ellram, 1995 and 1996).

Phase 1: Preliminary Phase

a) ***Identification of a need for partnering*:** Top management, based on competitive strategic plan of the firm, identifies the need for such partnership. Also, the need could be identified based on the environmental analysis or could come filtered through any functional area. Establishing the strategic need and top management support is crucial to the success of the partnership.

b) ***Formation of a team of representatives from major functional areas*:** A team should be formed with representation from all major functional areas that will be affected by the choice of a supplier partner.

c) ***Additional needs analysis*:** The team should analyze and substantiate the need for partnering as opposed to other contractual relationships or an arm's length relationship. In addition, the team should submit the findings to the top management for additional support.

Phase 2: Identify Partners

a) ***Determination of selection criteria:*** The team should determine the criteria of importance to the firm. It should include all such traditional supplier selection criteria as quality, availability, capability, cost etc. In addition to those, other qualities such as cultural compatibility and top management compatibility should also be considered. An important aspect in this step is that the list must be developed and debated and approved before the selection process is started.

b) ***Development of the list of potential suppliers*:** After the criteria are established, a list of potential suppliers who can meet the criteria should be developed. This list may include suppliers with whom the organization has had previous business deals. This list also should come from all departments who have some knowledge of suppliers' capability and had some experience with them.

Phase 3: Screen Potential Partners

The next step is screening the potential partners based on the developed criteria. The team should draw the relative experience from all functional areas to evaluate the potential partners. The team should rate the partners on a comparable scale across the potential list of suppliers. The supplier to be chosen for a purchasing partnership should be the one who meets, or appears to have the ability to meet, all the perceived needs of the firm at an acceptable level.

Phase 4: Establish the Relationship

The goal is to establish the foundation on which an ongoing relationship is based; one that is based on mutual trust, sharing, and commitment. A partnership will work only if the relationship is mutually beneficial. In establishing a relationship, it is necessary to have a high level of interaction, and this is critical to the success of the partnership.

Phase 5: Evaluate the Relationship

The future viability of partnering relationships will likely become obvious from six to twelve months into the relationship. Partnership evaluation is an ongoing process and should be performed by a team. Based on the evaluation, several courses of action should be pursued. Actions such as continuous monitoring of the relationship and performance, further building or expanding the relationship, dissolving or reducing the scope of the relationship, or dissolving the partnership, because of unsatisfactory performance.

15.2.2 Choosing the Right Partner

Once the decision is made to form a partnership, the critical question becomes with whom to partner. Strategic partnerships should be a win-win relationship where both parties benefit from the alliance. The partnership should add value to the larger organization, as well as be beneficial to the smaller organization. Finding the perfect fit is not easy and takes time, but is absolutely critical if success is to be achieved. Therefore, the partner selection process is a diligent and time-consuming one. Seven key steps to insure successful partnerships include:

- clearly identify the goals and objectives of the partnership,
- create a measurement process for each partner,
- commit the necessary resources,
- empower the leaders to get the job done,
- marshal internal resources and focus people on the alliance, and

- design a schedule and hold update meetings. (King, 1996)

By following these seven steps, the likelihood of successful partnerships greatly increases. Partnership goals need to be identified before hand, and the appropriate leaders must be chosen for the job.

Tips have also been offered to help form successful strategic alliances. First, the need of the organization must be defined. This definition is most frequently accomplished by feasibility studies. Next, the firm must identify potential partners and establish contact with the appropriate manager. In smaller firms, the chief executive should be contacted. The product manager or the senior business development officer should be contacted in the larger firm. During the evaluation of the potential partners, prices are discussed, and the financial conditions of the firm are investigated. One key in this phase is not to disclose everything. For example, you may not want to offer the names of potential customers. One of the most important keys is to develop and follow a good process and not to be rushed. Assessing potential partners takes time in order to make the right decision (Rosa, 1997).

There have also been other suggestions for choosing the right partner. Some suggest that the first step is the RFP, or the request for proposal. The RFP should ask the "right questions" instead of simply the most questions. It should be structured for ease of review, but be unstructured enough for the firm's values and culture to become apparent.

It is suggested that the firm seeking a partner "do their homework". In other words, they should research potential partners in order to find out as much as possible before hand. Seek out referrals from others that have worked with the firm. Finally, a site visit should be made to potential partners. A checklist should be brought to the visit to look over the company. The list should include such items as professionalism of personnel and environment, competency of management, and security of the facility (Fentem, 1997).

Specific characteristics of the right partner is that the partner's needs, skills and resources be completely complementary to those of the outsourcing firm. The partner should also be financially stable and well managed. Finally, the partner should have previous experience with partnerships. As experienced partners, they have moved up the learning curve at the expense of another partner (Slowinski, 1996).

According to Rackham (1996), there are three elements that are common to all successful partnerships: impact, intimacy, and vision. Impact is a partnership's capability to deliver tangible results. Successful partnerships increase productivity, add value, and improve profitability. Intimacy relates to the level of closeness between the partners. Partners that are successful have a close ongoing relationship built on trust. Finally, successful partnerships have a common vision. The vision is a specific picture of what the partnership can achieve, and how it is going to get there.

Factors to consider in choosing a partner include when to partner, what companies should be considered as potential partners, what are the characteristics of a good partner, and what steps should

be taken when making a decision. The key is to thoroughly investigate potential partners.

15.2.3 Negotiating the Partnership

The negotiation process begins once a partner is selected. The interests of the two parties are typically both complementary and conflicting; therefore, it is necessary to have an effective negotiation process to address the common interests, and resolve any differences. For example, they both want to succeed and become a marketable product or process. Each recognizes its own strength and weakness and the benefits of the strategic alliance. On the other hand, there are clearly interests that differ. The larger firm wants close monitoring of funding and tight control of their efforts. The smaller firm wants financial and nonfinancial assistance, but wants to remain as independent as possible. These issues must be discussed and resolved in the negotiation phase in order for the alliance to be successful (Slowinski, 1996).

There are some important issues to keep in mind when negotiating a contract with prospective outsourcers due to the intimate nature of the relationship. Some issues to keep in mind are accountability of performance, long-term flexibility, and confidentiality and ethical issues. Partners should be held accountable for their performance, especially if it is an outsourced vendor. Usually in strategic alliances or joint ventures, there is a sharing of the risks and rewards. Nevertheless, the organization should make sure that the work performed by the partner is up to their standards. The partner should provide an arrangement that builds in flexibility for the future in terms of variable capacity and variable pricing structure. Finally, confidentiality aspects of a company's information are addressed in all outsourcing contracts. To be effective, the outsourcer should be considered an extension of the organization. There must be confidence and trust that the partner will not share information with outsiders or reveal trade secrets (Colby, 1996).

A number of other issues are important as well. A thorough understanding and agreement by key management people of both companies on the objectives and ground rules for the alliance is a prerequisite for success. These discussions must deal with hard issues, such as who will be in charge of R&D, production, marketing and other functions. Other issues must be resolved, such as which decisions will be made by each organization, which decisions must be approved by both companies, and how disputes should be resolved. If there are fundamental differences or too many minor differences between the two companies, the alliance should be reexamined (Slowinski, 1996).

There are many variations to any partnership agreement, and each arrangement is different depending on each partner's needs. The common denominator for all successful agreements is the willingness of each side to openly describe its requirements, both those that are essential and nonessential. A complete understanding of what each is expected to contribute, and a realistic assessment of each party's ability to deliver is a prerequisite to a successful relationship.

15.2.4 Partnering Relationships

After a partner has been selected, negotiating the partnering relationship begins to evolve. What

distinguishes a partnering relationship from the traditional adversarial customer-suppler relationship? Apparently many purchasing agents think there is little difference. Unfortunately, the term "partnering" is frequently loosely used and abused. Often, partnerships are more "rhetoric than reality" (Bernard, 1997). For example, some would argue that a partnership exists when any type of long-term agreement is made between firms. However, agreements such as long-term contracts and special service arrangements do not have the type of commitment and cooperation needed to constitute a true partnership. These are contractual agreements, not partnerships. An even worse abuse of the term occurs when it is used to disguise a customer's attempt to control a supplier. Customers often say they want to be partners but are only really interested in dominating the supplier. At least two characteristics distinguish true partnering relationships. First, partnering is a long-term relationship between the customer and supplier. Secondly, in partnering relationships, both parties have an interest in the other's well-being. Or more specifically, good partner relationships have the following characteristics (Bernard, 1997).

- The partners are proactive.
- The parties are integrating key processes and activities.
- There is a commitment to developing and maintaining cooperative and close relationships.
- There is a clear and well-structured framework for determining cost, price, and profit for both sides.
- A win-win philosophy exists.
- Both parties are committed to continuous improvement in all spheres of their activities.

The commitment and mutual dependency represented by these characteristics are what differentiate a partnership from a traditional adversarial approach to outsourcing.

The partnering relationship is normally initiated and established through the initial negotiations as previously discussed. Negotiation has been defined as "a process of potentially opportunistic interaction by which two or more parties, with some apparent conflict, seek to do better through jointly decided action then they could otherwise" (Mieghem, 1995). This process is difficult and complicated when it is performed from the traditional simplistic and adversarial point of view. From partnering perspective, things get even more complicated. In this case, each party has to be concerned with not only their own interests, but also the interests of the other party as well.

In partnering, negotiation is a balance. Negotiating partnerships is a process of balancing conflict with cooperation, and relationship issues with substantive issues. In order to effect this balance and effect lasting relationships, customers and suppliers need to consider both their cooperative and

competitive positions, substantive issues, and conduct a negotiation analysis (Rognes, 1995).

Neither a purely cooperative nor a purely competitive perspective is appropriate when negotiating partnerships. The untrusting and adversarial win-lose nature of the purely competitive perspective obviously is not appropriate when entering a partnership. Conversely, choosing a purely cooperative perspective may compromise each party's self interests. However, choosing an "enlightened self-interest" point of view, balances the forces of cooperation and competition to effectively focus on mutual interests, merits, and results (Rognes, 1995). This point of view recognizes that the needs of both parties must be satisfied, and thus recognizes that each party must work to ensure that the needs of both parties are met by the partnership.

Considering and including relationship issues in the negotiations is crucial. The traditional approach of focusing on substantive issues is a short-term outlook, and focuses on short-term gains. However, long-term gains can only be obtained if negotiations consider the relationship. Relationship issues include establishing the procedures for interpersonal contacts, conflict resolution, team work and procedures for monitoring the relationship's performance. Agreeing to such things up front will put into place the mechanisms that will be used later to maintain and improve the relationship.

Conducting a negotiation analysis before interacting with the customer or supplier is also important. This analysis should include: examination of interests and issues; the generation of options; and an exploration of how options can be made into specific agreements. Examining the interests and issues involved is needed in order to determine each party's needs and their viable options. The generation of options is intuitively critical. As with any negotiation, each party must have at least more than one option. In partnerships, options are exceptionally important. When negotiating partnerships, the more viable options you have in mind entering the negotiation, the more likely you are going to be able to successfully match options with the other party.

Finally, when negotiating the partnership, and thereafter, the most important element of establishing and maintaining the relationship is trust. A trusting relationship exits when both the partners do the following (Smeltzer, 1997).

- Do not act in a purely self-serving manner.
- Accurately disclose relevant information when requested.
- Not change the specifications for the product or service.
- Generally act in an ethical manner.

In conclusion, establishing and maintaining good partner relationships requires planning up-front, a balancing of needs and an environment of trust.

15.2.5 Monitoring Supplier Relationships

Once a partnership has been established and orders are being placed, it may be tempting to stop managing the process. After all, one of the reasons companies outsource is that they do not want to manage the source of supply. Although outsourcing frees companies from the capital and technical requirements of running a business, it does not free them from the need to monitor the relationship to ensure that it is satisfying the needs of both parties. A partnership must be managed and it is not possible to manage, without some kind of measurement. There are basically two methods and four elements of measuring partnership success and monitoring it (Mieghem, 1995).

Reporting Methods

- Reports prepared by the supplier
- Reports prepared by the customer

Interpersonal Methods

- Focus groups and strategy meetings
- Customer and supplier feedback

Measures of partnership performance must consider the complexity and unique nature of such relationships. Since each relationship is unique, so should be some of its performance measures. It is inappropriate to apply the same generic performance measures to all partners. When establishing performance measures, consideration should be given to the reasons the relationship was formed. Measures need to gage how well the partnership is serving the purpose the partnership was established to serve, in the first place. Furthermore, while partnering relationships may be complex, their performance measures should not be. For performance measures of partnerships to be useful, they must be few, simple and focus on what is really important (Burt, 1993).

Of the two parties, suppliers are in the best position to provide reports on delivery, invoicing, and returns. Obviously in today's need for reduced inventories and speedy service, it is important to monitor the timeliness of the partnership. Suppliers can provide lead time reports that include order dates, promised dates, actual delivery dates, as well as the average lead time that resulted. If anything else can destroy a relationship it is money. Hence, a report listing invoiced prices, price actually paid, and when such payments were received, will provide useful information. Another source of tension occurs when a product or service is not meeting the customer's needs. Likewise, the supplier is in the best position to provide reports summarizing customer returns and complaints.

On the other side of the partnership, the customer is in a uniquely qualified position to supply reports on the relative performance of the partner and reports on supplier returns. Comparing the performance of the partnership with other suppliers can obviously yield good information as to the value of the relationship. Reports describing what products are being purchased, from which suppliers, along with price and backorder information, can provide a basis for such comparisons. A

great deal of trust will be needed for this kind of information exchange, but in an effective partnership, it is mandatory.

Additionally, supplier returns and rework can provide telling information about how effectively the partners are communicating. When a customer rejects a product or service because of an oversupply or quality problem and the supplier accepts the return, the supplier is accepting the reason for the return as well. Hence, the acceptance is an indication that both parties agree with what went wrong and what needs to be done to fix the problem. However, when a supplier rejects a customer's rejection, it is an indication that the parties have a different belief as to what constitutes a satisfactory product or service. Thus, a report describing supplier rejections can bring such communication breakdowns to light.

Focus groups can reveal opportunities for improvement in ways reports cannot. All the reports mentioned thus far can be used to bring to light exceptions to the normal of delivery, pricing, and quality of the product or service. These exceptions can be used to fix problems that have already occurred. However, this method of monitoring is not designed to prevent problems before they occur. A less formal method is needed for this purpose. Periodic focus group meetings can be used to not only fix problems identified by the aforementioned reports, but also to otherwise improve the partnership. These focus groups should consist of top management, as well as people within each organization that are a part of the partnership or a customer of the partnership. In such meetings, the partners can explore: successful aspects of the relationship; potential areas for improvement; and innovative things that each party may be doing with other customers or suppliers.

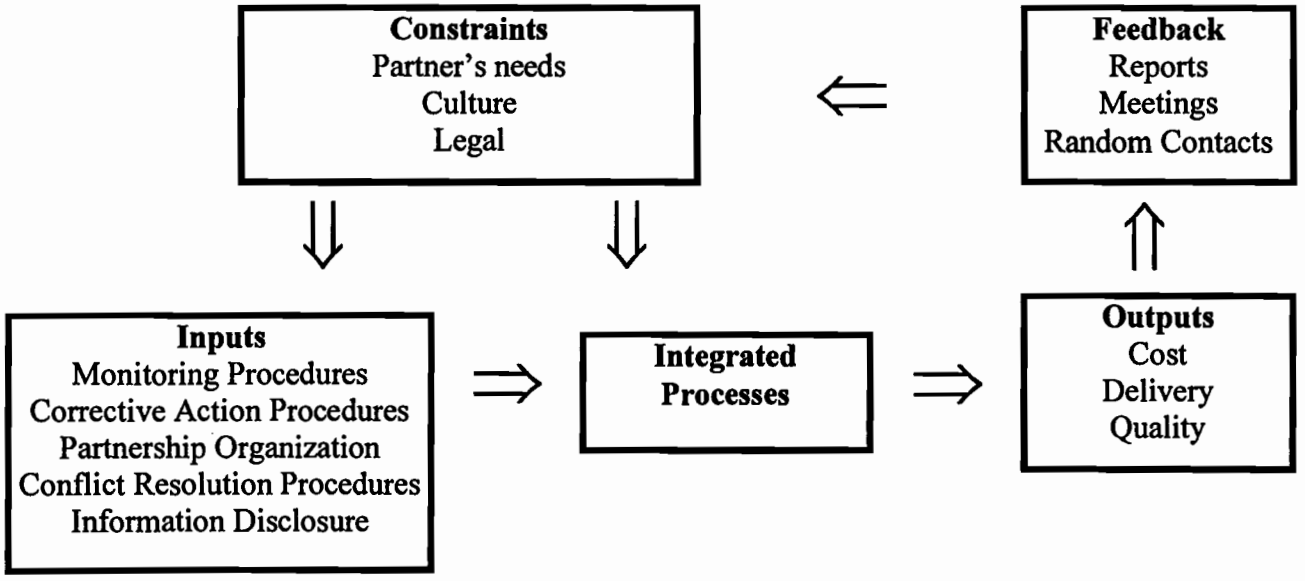
Partners need to actively pursue feedback regarding the performance of the partnership. Often customers and suppliers do not always give the feedback they could. Focus groups can be used for this purpose. But focus groups alone provide a relatively narrow sampling of viewpoints. Other methods can be used to solicit ideas for improvement. Random calls by buyers, account representatives, and top management to the other party can be used to get information regarding the performance of the relationship, that would otherwise not be provided. Additionally, surveys sent to partners can be used to get even a broader representation of how the relationship is performing, and how it can be improved.

While it may be helpful to get numerous functions involved when monitoring the partnering relationships, ultimately someone needs to be accountable for ensuring that such monitoring takes place and that it is effective. For this reason it is necessary to formally assign "relationship managers" for both partners (Burt, Doyle, 1993). These relationship managers should work together to act as: focal points for the collection and dissemination of performance measures; a clearinghouse for daily problem resolution; and as owners of the monitoring process. In performing this function, these managers need to ensure that the benefits of the relationship are actively being measured and actively used to improve the relationship's performance.

15.2.6 A Partner Relationship Model

Partnering relationships are summarized in Figure 15.2. As indicated, there are at least three constraints on the relationship. First, each partner brings certain fixed needs that must be fulfilled by the relationship. Secondly, each organization is going to have its own culture which will act as a constraint on the relationship. Lastly, there are potentially illegal restraint of trade issues when customers and partners build relationships. These elements, along with the inputs described, all enter into the processes that results in the product's cost, quality, and delivery. These outputs are evaluated, and the results are fed into corrective action procedures which act on the inputs and processes to improve the outputs. While this is obviously a simplified version of an extremely complex process, it does basically describe the elements of a partnering relationship. In order for this process to have any hope of succeeding, they must be implemented in consideration of both partner's needs, in an environment of mutual trust.

Figure 15.2 – A Partner Relationship Model



SECTION 16.0

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