

KENTUCKY TRANSPORTATION CENTER

College of Engineering

**OUTSOURCING OF KyTC PROJECT
DELIVERY FUNCTIONS**





UNIVERSITY OF KENTUCKY

College of Engineering
Kentucky Transportation Center

Our Mission

We provide services to the transportation community through research, technology transfer and education. We create and participate in partnerships to promote safe and effective transportation systems.

We Value...

Teamwork -- Listening and Communicating, Along with Courtesy and Respect for Others
Honesty and Ethical Behavior
Delivering the Highest Quality Products and Services
Continuous Improvement in All That We Do

For more information or a complete publication list, contact us

KENTUCKY TRANSPORTATION CENTER

176 Raymond Building
University of Kentucky
Lexington, Kentucky 40506-0281

(859) 257-4513
(859) 257-1815 (FAX)
1-800-432-0719
www.ktc.uky.edu
ktc@engr.uky.edu

The University of Kentucky is an Equal Opportunity Organization

Outsourcing of KyTC Project Delivery Functions

by

Donn E. Hancher, Ph.D., P.E.
Professor of Civil Engineering

April Brenneman, B.S.C.E.
Robin Meagher, B.E. (C.E.)
CE Graduate Research Assistant

Paul M. Goodrum, Ph.D., P.E.
Professor of Civil Engineering

Kentucky Transportation Center
College of Engineering
University of Kentucky

In cooperation with the Kentucky Transportation Cabinet

The Contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the data presented herein. The Contents do not necessarily reflect the official views or policies of the University of Kentucky, the Kentucky Transportation Cabinet, or the Kentucky Transportation Center. This report does not constitute a standard, specification, or regulation.

June 2005

Technical Report Documentation Page

1. Report No. KTC-05-12/SPR-282-04-1F		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle Outsourcing of KyTC Project Delivery Functions (KYSPR-282-04)				5. Report Date June 2005	
				6. Performing Organization Code	
				8. Performing Organization Report No. KTC-05-12/SPR-282-04-1F	
7. Author(s) Donn Hancher, April Brenneman, Robin Meagher and Paul Goodrum				10. Work Unit No. (TRAI5)	
9. Performing Organization Name and Address Kentucky Transportation Center College of Engineering University of Kentucky Lexington, Kentucky 40506-0281				11. Contract or Grant No. KYSPR-282-04	
				13. Type of Report and Period Covered Final	
12. Sponsoring Agency Name and Address Kentucky Transportation Cabinet State Office Building Frankfort, Kentucky 40622				14. Sponsoring Agency Code	
				15. Supplementary Notes Prepared in cooperation with the Kentucky Transportation Cabinet and the U.S. Department of Transportation, Federal Highway Administration	
16. Abstract <p>The rise in daily travelers on highways due to population growth, and higher quality and service expectations of the public, are putting increased demands on DOTs today. These demands, combined with decreasing staff sizes and changing resources, are causing DOTs to investigate alternative methods for accomplishing their essential functions. A major option is to contract out more of their work to external parties, commonly called "outsourcing." The purpose of this project was to evaluate the potential effectiveness, benefits, concerns and implementation requirements of outsourcing by the Kentucky Department of Highways.</p> <p>This report looks at current outsourcing practices in other states and in each KY district. It includes each districts' recommended percentages that each function should be outsourced. Geography, volume of staff, and specialized district needs make outsourcing uniformly throughout the state undesirable. In addition to allowing fluctuation between districts' outsourcing practices, maintaining core competency is also extremely important to receive positive results through outsourcing.</p> <p>Outsourcing continues to be an increasing concern for the KyTC as it appears that a large number of senior employees are considering retirement in the next 3 years. This report will hopefully help with the planning efforts for this challenge.</p>					
17. Key Words Outsourcing, Project Development, Management, Personnel Retirement, Core Competency			18. Distribution Statement Unlimited with approval of the Kentucky Transportation Cabinet		
19. Security Classif. (of this report) Unclassified		20. Security Classif. (of this page) Unclassified		21. No. of Pages 118	22. Price

TABLE OF CONTENTS

EXECUTIVE SUMMARY	iv
1.0 INTRODUCTION	1
1.1 Problem Statement	1
1.2 Background and Significance of Work	1
1.3 Goals and Objectives of Study	2
2.0 RESEARCH DATA COLLECTION	3
2.1 Literature Review	3
2.1.1 External Case Studies	6
2.2 University of Kentucky Research Surveys	11
2.2.1 Summary of DOT Comments	18
2.2.2 Concerns of DOTs	24
2.3 KyTC Advisory Committee Meetings	25
3.0 RETIREMENT IMPACT ON KTC	26
3.1 District One	26
3.2 District Two	26
3.3 District Three	26
3.4 District Four	27
3.5 District Five	27
3.6 District Six	27
3.7 District Seven	27
3.8 District Eight	27
3.9 District Nine	27
3.10 District Ten	28
3.11 District Eleven	28
3.12 District Twelve	28
4.0 PROPOSED OUTSOURCING BY KY DOH DISTRICTS	29
4.1 District One	30
4.2 District Two	34
4.3 District Three	38
4.4 District Four	42
4.5 District Five	45
4.6 District Six	50
4.7 District Seven	54
4.8 District Eight	58

4.9 District Nine.....	63
4.10 District Ten	68
4.11 District Eleven.....	72
4.12 District Twelve.....	74
5.0 PROPOSED OUTSOURCING FOR KYTC CENTRAL OFFICE.....	76
5.1 Planning Opinions.....	76
5.3 Equipment Maintenance Opinions.....	78
5.4 Snow and Ice Removal Opinions.....	78
5.5 Rest Area Opinions	79
5.6 Mowing Opinions	79
5.7 Materials Testing/Geotechnical Exploration Opinions	79
5.8 Traffic Operation Opinions.....	79
5.9 Road and Pavement Repair/Maintenance Opinions.....	80
6.0 SUMMARY AND RECOMMENDATIONS.....	81
BIBLIOGRAPHY.....	86
APPENDIX A.....	88
APPENDIX B.....	95
APPENDIX C.....	103

List of Figures

Figure 1: Factors Influencing Outsourcing Decisions.....4
Figure 2: Problems Associated with Outsourcing.....6
Figure 3: Average Outsourcing Rating for Each Function.....12
Figure 4: Percentage of Functions Outsourced by Each State..... 14
Figure 5: Relative Percentages of Outsourcing.....15
Figure 6: Average Rating for Each State.....16

List of Tables

Table 1: Percentage of Work Outsourced.....3
Table 2: Average Rating by Function.....12
Table 3: Average Outsourcing Rating by State.....17
Table 4: Districts’ 1 through 5 Recommended Outsourcing Percentages.....83
Table 5: Districts’ 7 through 10 Recommended Outsourcing Percentages.....84

EXECUTIVE SUMMARY

The goal of this study was to evaluate the feasibility of outsourcing the Kentucky Department of Highway's primary development functions. The following objectives have been identified for this study:

1. Review the current practices by DOTs for outsourcing primary project development functions.
2. Evaluate the effectiveness, benefits, and concerns of the outsourcing of primary project development functions by DOTs.
3. Evaluate the potential benefit of outsourcing primary project development functions of the KyDOH.
4. Develop guidelines for the outsourcing of primary project development functions by the KyDOH.

As a means of accomplishing their heightened project demand under resource restriction, State Departments of Transportation have successfully outsourced many routine functions to private sector consultants and contractors. An NCHRP study by Warne (2003) reviewed the changes in outsourcing practices by looking at practices in the past five years and looking forward to the outsourcing practices expected in the next two years. Only 5% of outsourced activities saw a decline over the past five years while 54% saw an increase in outsourcing activity. The design function is noted as having the highest percentage increase in the last five years. The state DOTs surveyed primarily indicated an increase of a constant level of outsourcing projected for the future. Researchers attributed this outcome to a reflection of the increased workload from the passage of TEA-21. Because outsourcing has evolved from being restricted to labor intensive, non-technical tasks, to now including innovative engineering design, outsourcing is a highly applicable concept to the variations in function and responsibility of state DOTs. Cost savings, innovation, improved quality and efficiency, peak demand performance, speedy project delivery time and risk management are a few of the benefits demonstrated through outsourcing.

As seen in the summarized comments from the survey respondents, there is a considerable amount of variation associated with the outsourcing needs and practices of state DOTs. Some DOTs, Texas for example, have established statutes requiring certain percentages of a function to be outsourced. With some functions, this established law serves the agency well in accomplishing its needs and meeting its responsibilities to the traveling public in the most efficient manner. With others, the statutes have been revised because of escalated costs and poor results. No concrete guidelines or best management practices have been established for outsourcing the functions and responsibilities for DOTs because of the extreme variation among the agencies. Rather, the most logical recommendation is to review the practices of a DOT and assess whether the most practical applications of in-house and outside resources are being used.

Metrics must be evaluated for each individual function with regard to current outsourcing practices. Public officials must evaluate each function's maximum outsourcing capability with respect to maintaining a core competency within the agency.

If the core competency of an agency can not be clearly identified and preserved, then the agency is not able to effectively meet the traveling public's needs. It is clear that outsourcing will continue to rise in the future given the trends of privatization, downsizing and the shift in focus of transportation agencies. It is the responsibility of every state DOT to subjectively look at their outsourcing practices and plans for the future.

Based on the national survey and literature review of outsourcing practices, the recommendation for the KyTC is to assess each of its function's potential for increased outsourcing with regard to the Cabinet's workload, staff availability, flexibility in schedule, in-house expertise and cost. With Kentucky being one of the states participating less in outsourcing, there is much potential for the Cabinet to identify areas for opportunity with regard to this practice. The results of the UK surveys clearly reveal that every function has the potential to be outsourced in a manner that is potentially as effective, in both quality of work and cost of work, as work performed in-house.

No function surveyed averaged below an effective quality rating of 3.4 (3.0 indicating no effective change). Few functions averaged below an effective cost rating of 3.0, 2.8 being the lowest average. Therefore, there are no functions that can be eliminated from potentially being outsourced based on having a negative quality effect. An argument could potentially be made against a slightly negative cost effect for four functions. However, there remains much speculation as to the validity of cost comparisons among work performed in-house and that of consultants. In reviewing functions seldom outsourced, such as program management, the states that did have experience in outsourcing this function, although limited, were pleased with the results they obtained.

The success of an outsourced function relies on the selection of a vendor that is reliable, trustworthy and whose objectives are aligned with those of the DOT. Management and oversight of such contracts from the perspective of the Cabinet is critical for project success. While it is important for the Cabinet to be able to perform all of the necessary functions expected of a transportation agency, it is also necessary for the Cabinet to provide leadership and management through the use of highly qualified consultants/contractors.

The experience of this investigation clarifies that the most useful source of information for outsourcing is found through surveys and interviews with personnel directly related to DOTs that have experience in outsourcing. In determining whether or not to outsource a given function, a decision must be based on a logical, systematic process considering: Costs, Expedition of Work, Peak Work Volumes, Unique Skills, Training, Human Resource Aspects, and Retention of Technical Personnel to Preserve Core Competencies.

Outsourcing is a necessity and a reality among state DOTs and is capable of successfully delivering transportation projects in an efficient and timely manner through public-private partnerships for the betterment of transportation infrastructures.

The data from the second survey of the KyTC District Offices is summarized in Table 4 and Table 5. Two of the districts did not submit a second survey summary; however, all responded to the first survey. The data shown reflects the level of outsourcing desired by the districts in the future if more outsourcing is necessary. What was interesting in the data submitted on “Outsourcing in the future” is that there is significant diversity amongst the districts, which is heavily related to the work environment and the near-future retirement impacts in their geographic areas. Although more in-depth evaluation by the Cabinet will be required in the future, the variation amongst the districts was believed to be appropriate by the researchers and should be considered in the future.

The study of outsourcing of KyTC functions has identified several practices in other states, in the Kentucky Districts, and in the Central Office. Outsourcing appears to be increasing and specific processes must be developed by the Central Office. The researchers realize that the KyTC will develop policy for outsourcing activities, but would like to make some general recommendations:

1. A core competency should be maintained for all essential functions of the KyTC to allow for the skill set to conduct basic functions and to monitor outsourced functions.
2. There are significant and valid variations in the need for outsourcing in the districts and the Central Office. A common practice for all is not feasible.
3. Better processes are needed to evaluate the total costs (direct and indirect) plus the quality of production for the functions conducted by the KyTC and those by external organizations.
4. Other factors to evaluate for outsourcing evaluation: workload requirements, time frame requirements, resources needed, available budgets, and availability of vendors (contractors, consultants, etc.) to do work.

1.0 INTRODUCTION

1.1 Problem Statement

There are many traditional functions carried out by a DOT that relate to its major responsibility for transportation project delivery. The key function is that of senior management, which is establishing the Department's work program, often called Program Management. The more traditional or primary functions are: Planning, Design, Right of Way, Pre-construction, Construction, Operations and Maintenance. All of these functions require manpower, resources, and senior management attention. For years DOTs have conducted most of their functions with their own resources. There has always been some outsourcing of work, especially for construction services and to a lesser extent, design services. The increasing demands on DOTs today, and changing resources, are causing investigation of alternative methods of accomplishing their essential functions. A major option is to contract out more of its work to external parties, commonly called "outsourcing." The purpose of this project is to evaluate the potential effectiveness, benefits, concerns and implementation requirements of outsourcing.

1.2 Background and Significance of Work

There are many functions carried out by a DOT and many relate to its major responsibility for transportation project delivery. The key function is that of senior management, which is often called Program Management. The more traditional functions are: Planning, Design, Right of Way, Pre-construction (surveying, contract bidding, inspection), Construction, Operations and Maintenance. In addition, the support functions of Research & Development and Administration (public relations, human resources, finance, continuous quality improvement, etc.) are also important functions that require manpower, resources, and senior management attention in project delivery. The goal of the DOT is to optimize its efforts to get the best output for its general public budget that is possible with respect to its available resources.

For years DOTs have conducted most of their functions with their own resources. There has always been some outsourcing of work, especially for construction services and to a lesser extent, design services. The increasing demands on DOTs today, and changing resources, are causing investigation of alternative methods of accomplishing their essential functions. Some of the key drivers influencing DOTs demand for outsourcing are shown below, with the problem of downsizing of workforce being most prevalent:

- Growth of the U.S. population and the resultant increase in travel demands;
- Increased magnitude of the construction/reconstruction projects required;
- User demand for better and quicker service, and minimal delays;
- Reduction in workforce in DOTs and/or loss of in-house specialty capabilities; and
- Ability to handle peaks in demand for services.

This changing environment has necessitated that a DOT seek to develop feasible alternatives to its current project development processes. A major option is to contract out more of its work to external parties, commonly called outsourcing. If adequate resources are available from outside sources to achieve successful results at a feasible price, more effort can be given to the overall management of the process, instead of carrying out the

detailed functions with its own forces. The difficulty is deciding what and how much to outsource, and what to handle in-house.

All DOTs have been involved in some outsourcing of its project delivery functions, especially design and construction. Each DOT must decide how much it can utilize outsourcing in its project delivery process to attain optimal return on investment and still provide excellent service to the general public. Regardless of the extent of outsourcing of a DOT's project delivery functions, it would still maintain the executive role of Program Management and be responsible for final Project Delivery and Performance.

1.3 Goals and Objectives of Study

The goal of this study was to evaluate the feasibility of outsourcing the Kentucky Department of Highway's primary development functions. The following objectives have been identified for this study:

5. Review the current practices by DOTs for outsourcing primary project development functions.
6. Evaluate the effectiveness, benefits, and concerns of the outsourcing of primary project development functions by DOTs.
7. Evaluate the potential benefit of outsourcing primary project development functions of the KyDOH.
8. Develop guidelines for the outsourcing of primary project development functions by the KyDOH.

2.0 RESEARCH DATA COLLECTION

2.1 Literature Review

An NCHRP study conducted by Witheford (1997) also entailed an investigation of the outsourcing practices of state DOTs. Thirty of the fifty departments of transportation responded to the two-part survey that asked what functions each DOT outsourced as well as the percentage outsourced and their experiences gained from those endeavors. Table 1 indicates the extent to which outsourcing was reported in the responding states for each of the surveyed functions and the prevailing patterns for each group. Only 9% of all the reported contracted activities were entirely outsourced, mostly in the areas of operations, maintenance and other. Few activities were fully (100%) outsourced as state agencies choose to keep major tasks in-house in preservation of their agencies' core competency. Under the maintenance function, 5 survey responses claimed to contract out the entirety of materials supply. Under the operations function, signal installation and Intelligent Transportation Systems (ITS) were 100% outsourced. For one-third of the reported functions, less than 20% of the total work volume in the activity was contracted out. Much of the reported outsourcing for all functions represents less than half of the total volume of work in the activity. This suggests that states retain staff for carrying out most work in-house and are contracting out peak workloads.

Table 1: Percentage of Work Outsourced (Source: Witheford, 1997)

Activity Group	0-19	20-39	40-59	60-79	80-99	100
Administration	4	6	7	1	4	1
Planning	8	6	5	4	11	3
Design	29	11	9	8	10	1
Right-of-Way	9	9	7	3	6	0
Construction Management	14	3	3	3	1	0
Operations	13	7	3	2	10	8
Maintenance	52	10	16	12	14	10
Other	6	4	0	2	6	15
Total	135	56	50	35	62	38

The NCHRP report also identified the variation in outsourcing between states, both in the activities outsourced, the proportion of work outsourced and the influences that affect an agencies' decision to outsource. Witheford (1997) identified the main factors influencing the nature and volume of work outsourced to include staff constraints, lack of specialty services or skills, legal requirements and policy directives. Staff constraints were the reason primarily cited for influencing the decision to outsource, either because of increased workloads or the downsizing of staff. Some states cited a combination of both workload increase and downsizing as their main influence for outsourcing. Staff constraints were dominant factors in deciding to outsource planning, design, right-of-way and construction. With regard to the maintenance function, policy direction was as heavy an influence as staff constraints and specialty skills. Several states have mandated statutes requiring the outsourcing of stated percentages of work. Few states require all maintenance to be outsourced while others have found it economically feasible to continue their own maintenance with state workforces. While

cost comparisons were rarely cited in most functions, they were named 30 times under the maintenance function as an influence to outsource. Figure 1 illustrates five factors commonly cited as influencing an agency's decision to outsource. The results from this survey show much variation among states. Such diversity in survey responses can be expected because of the variation in geographic and demographic natures of the states, historical and cultural aspects, state laws and the variation in highway network responsibility among state DOTs.

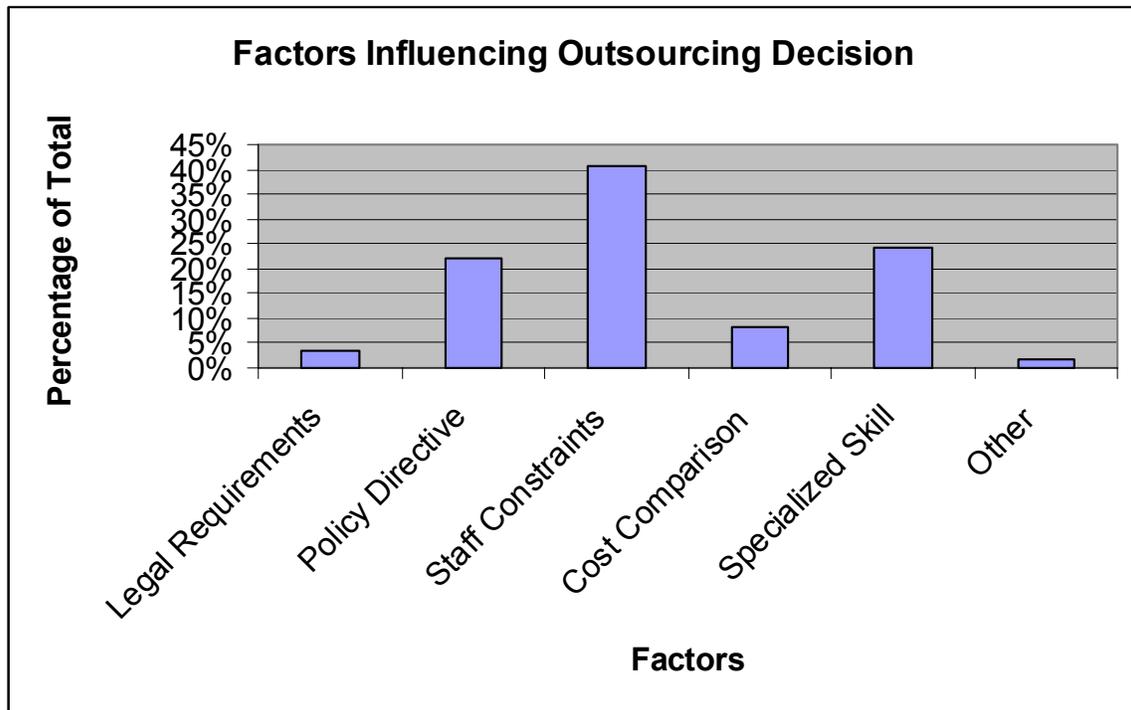


Figure 1: Factors Influencing Outsourcing Decisions (Source: Witheford, 1997)

Witheford (1997) proposed a twelve item checklist of factors to be considered when deciding to outsource. The list includes the following:

1. Limited in-house resources.
2. Need for specialized expertise or equipment.
3. Cost-effective comparison.
4. Better quality.
5. Public demand for new services.
6. Statutory requirements.
7. Agency policies.
8. Seasonality of work.
9. Contractor availability.
10. Industry pressures.
11. Employee/union concerns.
12. Emergencies.

Witheyford (1997) was also able to identify the benefits of outsourcing with respect to the departments, the contracting industry and the general public. DOTs have the potential to benefit greatly from the use of private consultants. Those benefits are especially important when it comes to supplementing staff work forces, increasing work volume and freeing up staff for other activities. DOT staff flexibility can be greatly enhanced when private firms are used to flatten peak workloads and seasonal demands. This flexibility adds to a DOTs ability to maintain schedules and expedite work. As previously stated, outsourcing utilizes the specialized skills and equipment that are often not available in-house. Finally, cost savings were mentioned as a potential benefit of outsourcing. This is however a debatable issue as comparing costs between in-house and consultants is often difficult. The benefits to the contracting industry include added sources of work, increased profit potential, job creation and employment, an enhanced local economy, an opportunity to enhance and broaden skills, stabilized workloads and increased competition. The general public would also benefit from outsourcing by having infrastructure projects delivered in a timely manner, the creation of jobs and stimulated economic development, potential cost savings, the efficient use of state employees, and better, safer highway systems.

As with any change in government management, there are impediments to the use of outsourcing as a tool for project completion. The most prominent being the lack of available in-house staff to perform work that, for whatever reason, can not be outsourced. This leads back to the initial concept of retaining a DOTs core competency. Also, with so much work being outsourced, there may be a lack of contractor forces to match the workload being outsourced. Other major impediments include the time involved with contract procurement, the expense of outsourcing, employee issues, the cost of administering and monitoring contracts, and the loss of in-house emergency response capabilities. The NCHRP study identified the problems associated with outsourcing which are illustrated in Figure 2. The time of delivery was the greatest complaint among state agencies, followed by the quality of the work. Contractor knowledge, the contract process, associated project costs and the required monitoring were the problems cited thereafter (Witheyford, 1997).

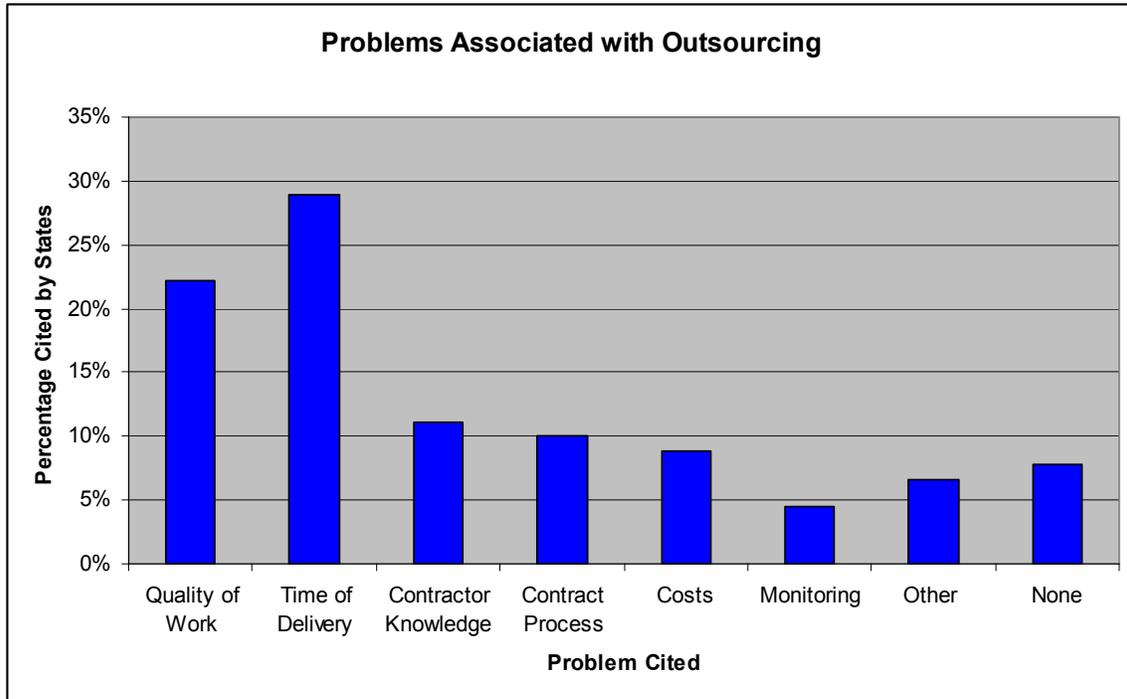


Figure 2: Problems Associated with Outsourcing (Source: Witheford, 1997)

2.1.1 External Case Studies

The following case studies provide insight into the driving motivation for outsourcing and give examples of successes that various DOTs have experienced. Examples of outsourcing various transportation functions from the Maryland, Virginia and South Carolina DOTs were reviewed. A case study with the Louisiana Department of Transportation and Development (LADOTD) identified five key factors found to be of greatest consideration in the outsourcing decision. The LADOTD has taken these factors and devised a computer-based model that assists public agencies in deciding what functions to outsource. Recommendations from both the Florida and Virginia DOTs are outlined for the success of future outsourcing endeavors.

Case Study - Virginia Department of Transportation

The Virginia DOT (VDOT) is the lead agency in the public-private procurement efforts made to establish the Washington Metropolitan Traveler Information Service (WMTIS). The WMTIS is the first multi-agency public-private partnership established with the VDOT for the implementation of an Intelligent Transportation System (ITS). The public sector is responsible for supplying project support in the form of project data, critical information and funding (70%) while the private firm is responsible for installing the needed communications and information processing infrastructure and providing additional funding (30%) for the ITS. All infrastructure, operations and maintenance for the installed traveler information service will be the liability of the private sector. The public-private partnership allows a public agency to provide a transportation facility to the public which it would not be able to do without using private capital. In exchange, the private sector is able to generate revenue through public resources. In the case of toll roads, the public sector will provide right-of-way, technical expertise, funding

mechanisms and permitting assistance to the private agencies who contribute capital, technical, construction and operating expertise.

Three dimensions of public-private partnerships are defined through the interest of maintaining road operations including pooled resources, shared risks and benefits, and reasons to maintain the partnership. A partnership requires more than exchanging dissimilar resources; it also requires similar resources to be pooled for the greater cause of the project. In the case of the WMTIS project, public sector data is pooled with marketable data formats provided by the private sector. Partnering requires that both benefits and risk be shared and clearly defined by contracts. In the case of the toll-road, the risk of public safety cannot be relinquished to the private sector. Risk for public agencies to perform is at the mercy of future political support while the private sector risks their reputation. A reason to maintain the partnership and good reputation is to establish greater influence in the marketplace. Success in partnering ventures provides public agencies the ability to maintain a positive political position. If the WMTIS were to fail in their partnering efforts, the public agency would be exposed to public and political criticism.

The goal of the WMTIS project is to develop an ITS system and infrastructure to be owned and operated for profit by a private sector partner based on a six-year contract. The system became operational in July of 1997. In the first three years of the contract, the following activities were performed:

- Installation of communication hardware and software infrastructure.
- Integration of traveler information from public transit, carpool and traffic information.
- Analysis of public transit information for resale by private information providers.
- Recruiting of information providers and assistance in marketing services.
- Evaluation of services as it relates to the regional transportation goals.

After six years, the public sector will evaluate the benefits of the WMTIS project with respect to the value gained by the traveling public. Based on the evaluation, the public sector will determine the remaining role of the WMTIS whether it be renegotiating revenue sharing terms with the contractor or contracting with a new private partner (Booz-Allen and Hamilton).

Case Study - Maryland State Highway Administration and DOT

The Maryland State Highway Administration (SHA) was given the task in 1999 to provide intersection improvements for some of the most congested intersections in the state. The SHA was required to analyze over 150 intersections, develop traffic solutions and begin construction on the highest priority locations, all within a two year time frame. The current work load and staff limitations required the SHA to seek help from a General Engineering Consultant (GEC) to perform the study under the management of the SHA. The SHA designed 25 of the intersections as a means of utilizing their available technical staff while the remaining intersections were outsourced to the GEC. The responsibilities of the GEC included traditional management functions (review task proposals, negotiate work hours and monitor productivity), lead public meetings, manage permit submittals,

review schedules and budgets, and submit status reports to the SHA. This agreement was successful and since has expanded the relationship between the SHA and the GEC, allowing the consultant to undertake major projects in Maryland. SHA is currently using the GEC as a project manager to oversee four different consultant firms who are performing traffic studies and designing eight interchange projects. The GEC for this contract is receiving \$4.5 million for overseeing everything from aesthetics to the constructability of a \$250 million construction project. These examples illustrate the success of outsourcing traffic operations at varying levels of management (Science Applications International Corporation 2003).

With the success Maryland has had in their outsourcing endeavors, the former governor established the Maryland Transportation Authority which authorizes public-private partnerships to finance, construct, operate, repair, and maintain vehicle parking facilities in Maryland's smart growth areas. The Authority oversees contractual agreements between government agencies and private entities that are providing goods and services for the general public. Private firms are given the responsibility to finance, construct and operate new transportation facilities including ports, airports, railroads or transit facilities. One of the Authority's latest ventures is with the Maryland Department of Transportation. The Authority will issue \$120 million in revenue bonds for the construction of a consolidated car rental facility at Baltimore/Washington International Airport. Additionally, \$273 million in revenue bonds will be issued for a new parking facility and related improvements (Maryland Transportation Authority 2004).

Case Study - South Carolina Department of Transportation

The South Carolina Department of Transportation (SCDOT) is on a fast track approach to completing 27 years worth of road and bridge projects in just 7 years. The "27 in 7" Peak Performance Program will allow the SCDOT to make the necessary widening and interchange improvements to account for the state's booming growth and economic development. The SCDOT is setting aside its traditional means of doing business in favor of innovative finance methods that are based on public-private partnerships, financial partnerships with local planning organizations and creative financing methods with federal funding. Two construction and resource management (CRM) firms will be used to further speed project delivery while avoiding inflation of state agency employees. The SCDOT oversees two CRM firms that have expertise in road and bridge design and construction and will tackle over 200 projects in the state of South Carolina. Parsons Brinckerhoff/LPA Group will cover the projects in the Eastern Region of the state while Flour Daniel handles the Western Region. This partnership consists of \$760 million in road and bridge projects and allows the SCDOT to avoid hiring over 500 additional employees that would be required to meet the added workload. The initial financing plan made assumptions regarding project costs, inflation, future interest rates, availability of federal funds and project time schedules. This contract, signed in 1999 is the largest public-private partnership undertaken for transportation projects in the United States.

The innovative financing techniques combined with public-private partnerships has allowed the SCDOT to meet its goal "to serve motorists and support the economic growth of South Carolina by doing a lot of work and getting it done quickly." Applying a successful public-private partnership under peak performance standards to enhance the

transportation needs of all travelers will significantly change the landscape of South Carolina, both physically and economically. Because South Carolina's beaches offer hot spots for tourists, the transportation needs of all travelers must be met with efficiency for the greater economical gain of the state.

The Cross Island Parkway is one example of the success of a privatized toll collection highway. This \$83 million project was completed in 1998 and was financed by state funds, federal funds, state highway bonds and tolls. This privatized toll collection highway uses an electronic toll collection transponder to deduct tolls. The ITS device is utilized by 60% of the Cross Island Parkway patrons. The SCDOT has been pleased with the adequate traffic counts gathered by the private sector as well as the highly successful facility marketing partnership and beautification efforts. This facility has significantly reduced the congestion previously experienced on the roadway. All aspects of the toll road will be managed by a private firm, relieving state employees of the tedious task. When the State Highway Bonds that financed the project are retired, the toll collections will cease and the contract with the outsourced firm will end.

Another successful project supported by the 27 in 7 Peak Performance Plan was the 16 mile, four-lane road linking Interstates 85 and 385. The Southern Connector in Greenville County was completed in February 2001, nine months ahead of schedule. It was financed by The Connector 2000 Association which is a not-for-profit corporation that was established to finance and operate the roadway. This unusual arrangement allows the association to issue \$200 million in toll revenue bonds which the state of South Carolina has no liability for. The SCDOT accepted the Southern Connector as part of its transportation system after the construction was complete.

Toll roads with ITS capabilities along with interstate widening, interchange enhancements, bridge rehabilitation and construction of new highways are a sampling of the projects outsourced through public-private partnering. Many of the projects were funded through revenue bonds which the SCDOT plans to pay off by dedicating future federal funds, rather than state highway dollars, to make bond payments and retire the debt. Additionally, through the success of public-private partnering, South Carolina was chosen to participate in the State Infrastructure Bank program which provided further funding through the U.S. Department of Transportation in the form of a loan for \$215 million. The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) which provided the loan was established under TEA-21 to provide direct or indirect loan guarantees for transportation projects over \$100 million. The SIB has funded projects including SC Highway 22 (Veterans Highway), which is a 28.5 mile road which provides a more direct route to Myrtle Beach. This design-build project began in March 1998 and was completed in May 2001. The SIB loan also funded the Cooper Ridge Bridge Replacement, the largest project in SCDOT history. This project was signed in July 2001 and is scheduled for completion in July 2006. State Infrastructure Bank assistance totaled \$325 million.

Since the inception of the 27 in 7 program, all four interstate widening projects have been complete and 8 of 11 interchange projects have been contracted out. As of July 2002, 3 years into the program, all highway and bridge projects were on schedule. The SCDOT has issued \$550 million in bonds with an average interest rate below 5 percent. The success of such outsourcing endeavors has allowed the fourth largest highway system to meet, with much efficiency and timeliness, the projects that

necessitate a functional transportation system for the travelers of South Carolina (South Carolina Department of Transportation, 2002).

Case Study - Louisiana Department of Transportation and Development

The Louisiana Department of Transportation and Development (LADOTD) has identified five key factors found to be of greatest consideration in the outsourcing decision, including (1) economic factors, (2) vendor service reliability and service of quality, (3) legal ramifications, (4) impact on strategic core competencies and (5) sociological factors. The LADOTD has taken these factors and devised a systematic, objective, computer-based model that assists public agencies in deciding what functions to outsource. The model allows for the evaluation of potential outsourcing functions and activities but is currently limited to highway markers, highway striping and maintenance of rest areas. The model evaluates the need for outsourcing based on cost and non-cost issues related to outsourcing. The LADOTD has also developed a comprehensive model addressing the warrants of outsourcing by:

1. Identifying DOT strategic functions that represent core activities.
2. Developing a decision model of analysis of outsourcing opportunities, considering alternatives.
3. Considering qualitative factors that are relevant to the outsourcing decision.
4. Applying the decision model to one or more DOT functions for which outsourcing is foreseeable.

The LADOTD recognizes that the goal of public agencies is to find the proper balance between public and private contributions to transportation functions, achieving effectiveness and efficiency for the DOT while maintaining the core competency. It should be recognized that the computer model developed by the LADOTD is a tool that aids in the decision making process for outsourcing but is not a prescriptive device (Science Applications International Corporation 2003).

Case Study - Recommendations from the Florida Department of Transportation

FDOT has been extremely active in outsourcing functions within their agency. Based on their experience, FDOT has developed critical success factors that include (1) properly defining the scope of work so it is easily understood by all involved parties; (2) using established measures and procedures/policies including revisions throughout the contract period, and (3) provision of adequate start up time and selection of contractors based on technical proposals as well as price. FDOT bases contractor selection on 60% technical and 40% price. FDOT also suggests (4) comprising a list of assurances to guarantee performance including the implementation of an annual performance bond, a pre-determined reduction in payment for failure to meet established performance requirements, basing of future work contingent upon satisfactory historical performance and requiring the proposal to be part of the contract terms (Science Applications International Corporation 2003).

Case Study - Recommendations from the Virginia Department of Transportation

In addition to the FDOT's recommendations, the Virginia DOT has established a list of questions that are applicable in the legal review of contract documents regarding risk management and outsourcing. State DOTs are encouraged to pose these questions when reviewing such legal documents:

1. Are the documents well-drawn legal documents that give the DOT the protection it needs in order to hold the contractor liable for the work performed?
2. How are the risks allocated to the DOT and to the contractor?
3. Who will be legally responsible in the circumstance where some level of non-performance on the part of the contractor is present?
4. What are some best management practices from a legal perspective that should be incorporated into these contracts?

2.2 University of Kentucky Research Surveys

A survey was conducted in the Fall of 2003 at the University of Kentucky regarding the outsourcing patterns of Other State DOTs. The responses from thirty of the fifty contacted states were analyzed to gain insight as to what transportation functions have been outsourced, along with the satisfaction level of each function with respect to cost and quality of service. The questionnaire asked DOT officials to respond to which functions they have outsourced and to comment on those particular functions. Additionally, a table was provided in the survey with a list of the functions and rating columns for both cost of service and quality of service on a scale of 1 to 5 (1 being a negative effect, 3 indicating no change, 5 being very effective). Table 2 indicates the average responses of all the surveyed states, categorized by function with respect to quality and cost of service. Figure 3 illustrates this table by displaying the average quality and cost rating for each function. The functions range from daily routine maintenance tasks to intense capital program delivery functions requiring technical design and planning skills.

Table 2: Average Rating by Function

FUNCTION	AVERAGE RATING (Scale of 1-5)	
	Quality of Service	Cost of Service
Program Management (Annual or Multi-year)	4.4	3.7
Planning	3.6	3.1
Design	3.6	2.7
Environmental Studies/Permits	3.7	2.9
Right of Way	3.4	2.9
Surveying/Photogrammetry	3.6	3.1
Geotechnical/Materials Testing	3.5	3.0
Utilities/Railroad Coordination	3.9	3.4
Contract Procurement (Projects)	3.7	3.1
Construction	3.5	2.8
Construction Engineering (Oversight, Inspection, QA/QC)	3.6	3.4
Maintenance	3.6	3.3
Traffic Operations	3.8	3.3
Legal Services	3.7	3.2
Equipment Purchasing/Maintenance	4.7	4.0
Rest Areas	4.0	4.0
Other Functions	1.0	n/a

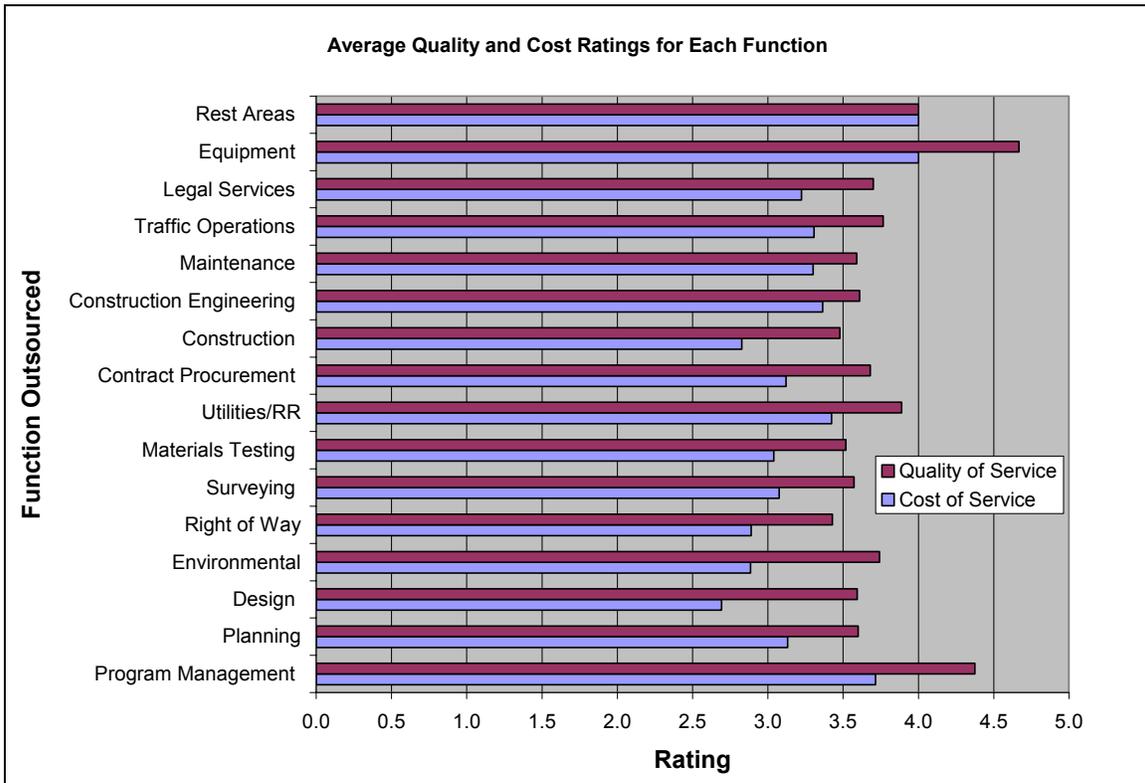


Figure 3: Average Outsourcing Rating for Each Function

Figure 4 illustrates the percentage of functions outsourced by each state DOT with respect to the 17 functions listed on the survey. The percentage of functions outsourced by each state does not necessarily reflect the amount each state is outsourcing a given function. For instance, a DOT may be outsourcing every function but may only be doing so at 5% for one function and 95% for another. The DOTs outsourcing the most functions (15 out of 17 activities) were Connecticut, Maryland, Oklahoma, South Carolina and Virginia. Outsourcing the least amount of functions were California, Delaware, Kentucky and West Virginia (9 or less of the 17 activities). This does not mean that these states are outsourcing the most or least overall; rather they are outsourcing the most or least number of functions. The survey did not request specific outsourcing percentages, although some states volunteered this information.

The average quality and cost ratings for each function illustrate that the quality of service exceeds that of the cost of service in all functions surveyed. Most DOTs were pleased or indicated no significant change with the quality of service they received but indicate that the cost of service was not as effective. Equipment Purchasing and Maintenance (4.0) and Rest Areas (4.0) were the two functions having the greatest effective cost of service while Equipment Purchasing and Maintenance (4.7), Program Management (4.4) and Rest Areas (4.0) had the greatest effective quality of service. That being said, it is important to compare those results with Figure 5 which represents the percentage of states that responded “Yes” to outsourcing each function. Design, right of way procurement, and surveying and photogrammetry were the functions found with the highest outsourcing frequency. These functions are heavily outsourced because of the expertise and time required for design, the legal ramifications associated with right-of-way procurement and the limited resources and equipment available for surveying and photogrammetry. Program Management and contract procurement were the functions least outsourced by DOTs. This is expected because DOTs do not want to surrender the authority of managing their projects as well as procuring future projects. It is the responsibility of the states to facilitate transportation initiatives which requires them to have control. Contract procurement methods are developed within each state DOT and such methods must be held consistent for all endeavors. A state DOT also has experience with contractors, based on past performance and therefore knows which contractors are most suitable for certain projects.

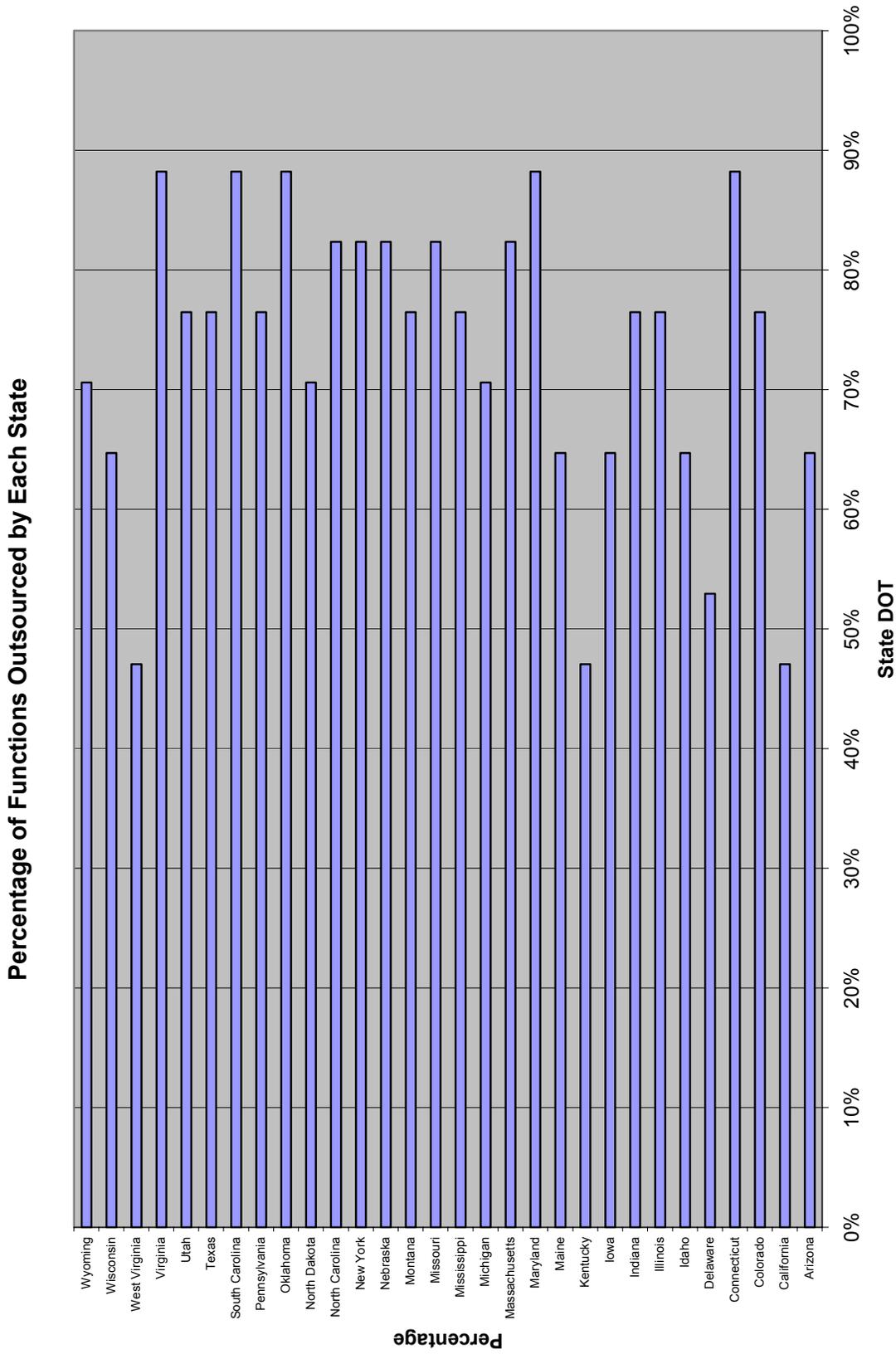


Figure 4: Percentage of Functions Outsourced by Each State

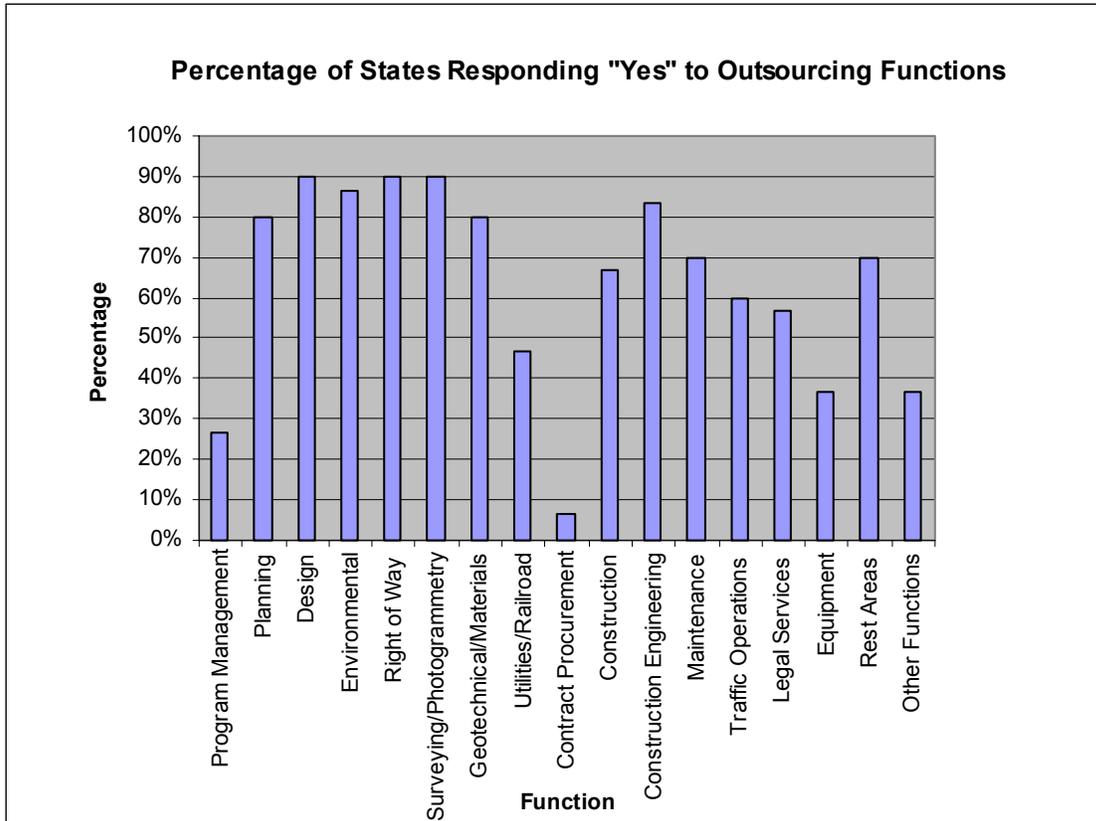


Figure 5: Relative Percentages of Outsourcing

The survey results from each state are represented graphically in Figure 6. The seventeen functions were averaged yielding a cost of service and quality of service rating for each state. This data is tabulated in Table 3. North Carolina and Wisconsin failed to rate each outsourcing function but did supply comments on their experiences. West Virginia, South Carolina, Indiana, Delaware and California indicated significant effectiveness in the quality of service through their outsourcing experiences. For the majority of states, the quality of service proved more effective than the cost of service. Oklahoma was the only state that averaged a slightly negative quality of service. Eleven states indicated a slightly negative cost of service.

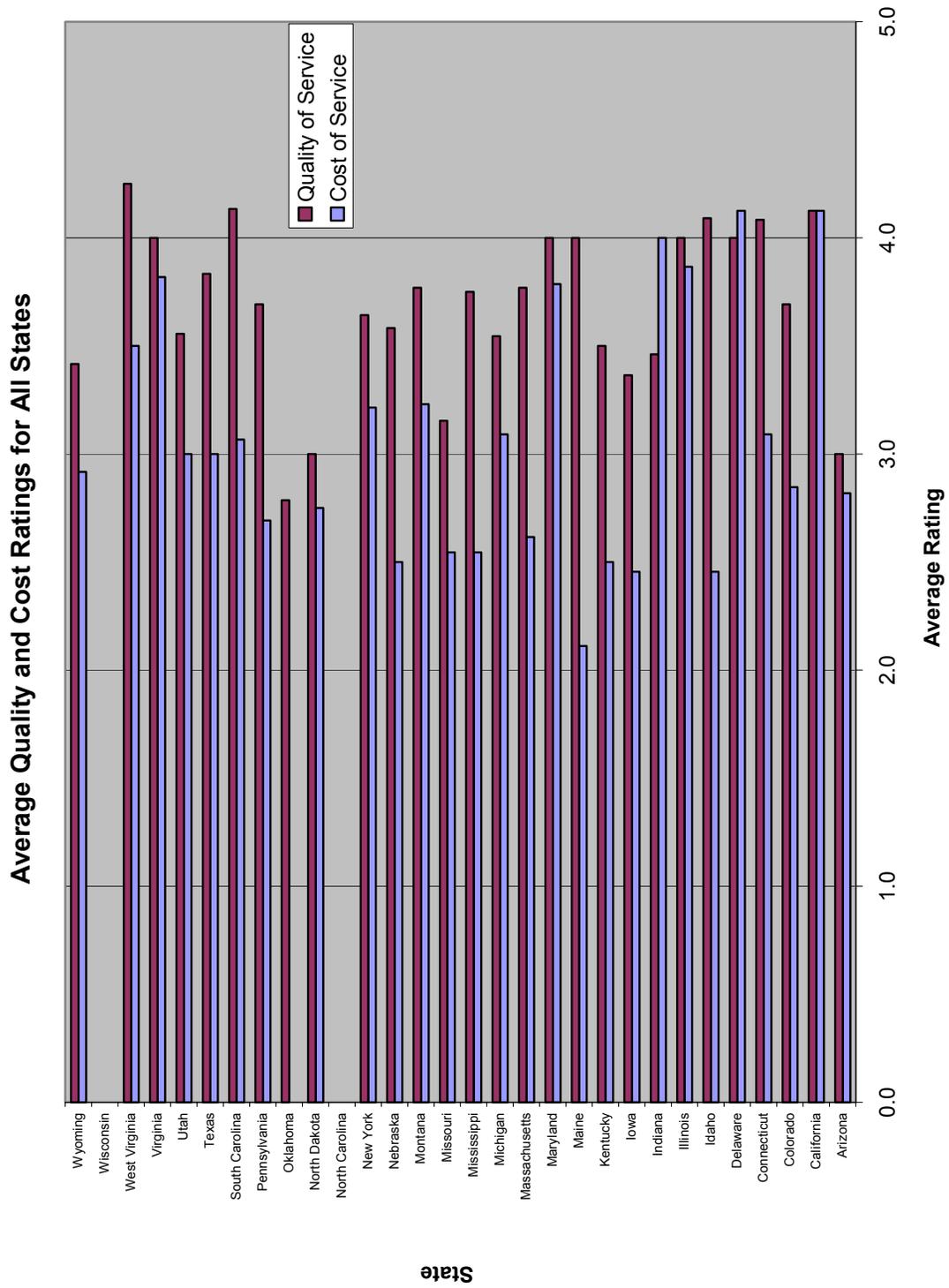


Figure 6: Average Rating for Each State

Table 3: Average Outsourcing Rating by State

STATE	AVERAGE RATING (Scale of 1 to 5)	
	Quality of Service	Cost of Service
Arizona	3.0	2.8
California	4.1	4.1
Colorado	3.7	2.8
Connecticut	4.1	3.1
Delaware	4.0	4.1
Idaho	4.1	2.5
Illinois	4.0	3.9
Indiana	3.5	4.0
Iowa	3.4	2.5
Kentucky	3.5	2.5
Maine	4.0	2.1
Maryland	4.0	3.8
Massachusetts	3.8	2.6
Michigan	3.5	3.1
Mississippi	3.8	2.5
Missouri	3.2	2.5
Montana	3.8	3.2
Nebraska	3.6	2.5
New York	3.6	3.2
North Carolina	n/a	n/a
North Dakota	3.0	2.8
Oklahoma	2.8	n/a
Pennsylvania	3.7	2.7
South Carolina	4.1	3.1
Texas	3.8	3.0
Utah	3.6	3.0
Virginia	4.0	3.8
West Virginia	4.3	3.5
Wisconsin	n/a	n/a
Wyoming	3.4	2.9

In looking at the outcome of the survey results from the various states, it becomes necessary to state that while the main goals of serving community needs in transportation are similar among all DOTs, there are many characteristics that vary among the states. Political aspects, regulation, geographical constraints and organizational structure are among the major characteristics that will define a state's ability to achieve their transportation goals (Eger, 2002). These characteristics are fundamental in determining the outsourcing needs and capabilities of a given state. Based on the qualitative responses provided by each state DOT, further investigation was made into the

outsourcing efforts and the public-private cooperative experience found in state DOTs across the nation.

2.2.1 Summary of DOT Comments

The following is a summary of the comments made by the thirty responding states regarding their experiences with outsourcing. All seventeen functions are summarized and states having unique experiences, both positive and negative are highlighted. There is a considerable amount of variation among the views of the DOTs on outsourcing the various functions.

Construction

The construction function of DOTs is heavily outsourced as 83% of the survey participants responded to outsourcing construction in their DOTs. Some states are required by law to outsource construction projects over an established amount. For instance, Arizona has a legislative limit that requires all construction over \$50,000 to be contracted out. Colorado's statute states that all construction over \$150,000 is required to be outsourced. At least 14 of the surveyed DOTs contract 100% of all capital construction projects, some are required by state law. Indiana stated bid lettings for construction of approximately \$700 million per year while Iowa cited letting \$400 million worth of construction per year. Nearly all DOTs mentioned their method of contract procurement to be based on the competitive low bid process. The average effective quality of service for outsourcing construction was 3.5 and the average effective cost of service for this function was 2.8.

Utilities/Railroad Coordination

Utilities are contracted out by 63% of the responding DOTs. Maryland stated that they provide oversight with their existing staff for outsourced utility work. Texas stated outsourcing utility coordination only on large, metropolitan projects while Utah outsources utility agreements only on design/build projects. Many DOTs stated that if the function is not entirely contracted out, the volume of outsourcing is based on workload or need. A small number of DOTs stated that utility coordination was contracted as a part of outsourced design work. Few DOTs commented on railroad coordination but those that did kept railroad coordination in-house. The average effective quality of service for outsourcing utilities and railroad coordination was 3.9 and the average effective cost of service for this function was 3.4.

Traffic Operations

Traffic operations were outsourced by 70% of the responding DOTs. Intelligent Transportation Systems (ITS) are often outsourced by all DOTs because of the expertise required for design and the staff required for maintenance. South Carolina's 27 in 7 Peak Performance Program is a prime example of utilizing ITS for toll collection. Large traffic studies and large design projects were generally outsourced by all DOTs. As previously stated in the case studies, Maryland hired a General Engineering Consultant to complete analysis and begin construction on 150 intersections in a 2-year time frame. Maryland designed 25 of the intersections to utilize their available technical staff and outsourced the remainder. The Maryland DOT also cited the outsourcing of traffic

control around BWI airport. Other traffic operations including, signal timings, coordination and maintenance were moderately outsourced by all DOTs. Traffic Safety Programs, Transportation Management Centers and Traffic Information Centers in Texas, New York and St. Louis, Missouri, respectively were other examples of successfully outsourced traffic operation functions. The average effective quality of service for outsourcing traffic operations was 3.8 and the average effective cost of service for this function was 3.3.

The NCHRP performed a study regarding the current practices in outsourcing traffic operations including pavement markings, signal installation, ITS, toll collection and traffic information services. The study found that the three most outsourced functions by a DOT were ITS (80-99%), toll collection (100%) and traffic information services (100%). This outcome is concomitant to the findings that most outsourcing is the result of staff constraints (42%) and the need for specialty skills and equipment (29%). Similar characteristics exist for outsourcing these types of functions including the use of specialty contractors, the implementation of a prequalification process for contractors, and the unit price method of payment. In studying the amount of outsourcing occurring in various states, the study found that 13% of the activities are fully outsourced (100%). Of this group, more than one-third were classified as traffic operations, mostly in the area of ITS. The NCHRP officials concluded that states are reluctant to give away all of the responsibility for an activity, with the exception of ITS and if the activity requires special expertise, they are more likely to outsource that activity. ITS represents a specialty skill that may never be established by state employment at a DOT (Warne 2003).

Surveying/Photogrammetry

Surveying and photogrammetry was outsourced by 100% of the survey respondents. Outsourcing surveying in most states is used to supplement limited in-house crews. NYSDOT was cited as outsourcing 60% of their surveying work. Some states were looking to keep small crews to maintain in-house expertise. A few DOTs stated that they have on-call agreements in place in anticipation of surveying work that is beyond their staffing limits. Additionally, surveying can be outsourced as a separate activity or in conjunction with design and/or construction functions. For instance, Utah outsources 50% of their right-of-way surveying work and only 10% of their pre-construction surveying work. All of their construction engineering surveying is contracted out. Photogrammetry is outsourced in nearly every state as well, usually because of the extensive amount of technical equipment required. The average effective quality of service for outsourcing surveying and photogrammetry was 3.6 and the average effective cost of service for this function was 3.1.

Construction Engineering

Construction engineering includes the oversight, inspection and QC/QA of projects. This function was outsourced by 90% of the survey respondents. However, this function is outsourced minimally within those agencies, more so on large projects. Iowa cites outsourcing only 5% of small projects like rest areas and parks. However, the Maryland DOT stated that “outsourcing this function is critical to managing large construction programs with limited staff. The downside is that these individuals become critical to the projects. Replacements are faced with steep learning curves that can be

difficult to overcome.” South Carolina is actively participating in utilizing construction engineering consultants to handle approximately 100 projects over 7 years. On-call firms are used by the SCDOT to assist their personnel on an as-needed basis. Several DOTs stated that they try to keep construction engineering and inspection (CEI) in-house but have not found it to be overly critical to the success of the project. NYSDOT outsources 50% (in terms of dollars) of all CEI of their capital construction program. Most states participate in minimal outsourcing of inspection but no states were adamantly against outsourcing inspection. VDOT outsources 24-30% of inspection services. Utah outsourced construction engineering on design/build projects and handles their own QC/QA. However, traditional design/bid/build projects are engineered by in-house resources. Outsourcing this function is again based on workload. Some DOTs stated that they would like to outsource more CEI. The average effective quality of service for outsourcing construction engineering and inspection was 3.6 and the average effective cost of service for this function was 3.4.

Maintenance

The maintenance function was outsourced by 80% of the responding agencies. This category includes mowing, sweeping, guardrail maintenance, resurfacing, striping, lighting and sign maintenance, litter-pick-up, etc. and is often outsourced due to the labor intensity. Massachusetts outsources 50% of their maintenance services to state union forces and private firms who compete for the contracts. NYSDOT spends \$10-15 million annually on maintenance outsourcing. TxDOT is required by law to outsource 50% of their agency’s maintenance needs and is currently outsourcing 54%. DOTs cited outsourcing the maintenance function to supplement limited in-house staff. Many DOTs outsource this function especially for labor intensive tasks and specialized functions. The Michigan DOT (MDOT) contracts with 63 of 84 counties and municipalities to perform routine maintenance. MDOT uses their own work force in about 30 counties on roads and all of the counties for bridge work, contracting when necessary. Arkansas found the cost for maintenance contracts to generally be 30% higher than their in-house costs. However, with the reduction in labor force experienced by their agency, the work would not be accomplished if it were not outsourced. The average effective quality of service for outsourcing maintenance was 3.6 and the average effective cost of service for this function was 3.3.

Legal Services

Legal services were outsourced by 63% of the survey respondents. In most DOTs, legal services are provided by Attorney General. Many states cited outsourcing specialized legal services. Maryland, for instance outsources bond counsel while Missouri outsources general liability, debt collection and worker’s compensation cases. Texas outsources admiralty, patents and copyrights, criminal defense, and complex environmental matters. Illinois and Indiana outsource right-of-way condemnation cases. SCDOT has an on-call legal firm for construction claims. Utah has found the outsourcing of legal services to be highly effective, yet costly. The average effective quality of service for outsourcing legal services was 3.7 and the average effective cost of service for this function was 3.2.

Equipment Purchasing/Maintenance

Equipment purchasing and maintenance was only outsourced by 50% of the survey respondents. DOTs cited outsourcing special maintenance functions such as body work, painting, glass replacement, major rebuilding of engines, etc. Few DOTs outsource equipment purchasing but those that do, outsource it through another state agency. Massachusetts has statewide (interagency) maintenance contracts used for motor pool/fleet management as does Kentucky. KyTC also outsources the purchasing and storage of fuel by using private retail locations and private vendor bill management (single source payments). Most states feel that routine maintenance is cheaper in-house. For instance, NYSDOT's equipment maintenance performed by in-house staff is approximately \$20 per hour less expensive for most repair activities. NYSDOT will outsource oil changes, glass work, spring repair and small engine repairs (lawnmowers and chain saws) when it is cost effective. Arkansas has the lowest administrative cost per mile of any state DOT. TxDOT has established equipment maintenance and repair and automotive parts warehousing as two major areas of outsourcing. State law once mandated a significant amount of maintenance work to be outsourced but then determined that vendor costs were 46% higher than the department's in-house costs. The state law has since been rescinded to allow for more in-house maintenance. Few DOTs outsource maintenance completely but those that do are satisfied with the quality and cost. The average effective quality of service for outsourcing equipment purchasing and maintenance was 4.7 and the average effective cost of service for this function was 4.0.

Rest Areas

Rest areas are outsourced by 87% of the survey respondents. Daily maintenance and custodial/janitorial services are usually outsourced. TxDOT outsources 100% of its rest area operations. NYSDOT has a "Green Thumb" Program which hires senior citizens and has proven to be very economical. Their experience with contract vendors has not been as beneficial as they are much more expensive and the quality of work has not been consistent. KyTC outsources custodial and ground maintenance for 24 of 29 rest area locations. All but one of these outsourced locations are let to non-profit organizations who hire and train disabled individuals. The design and construction of rest areas is often outsourced. The average effective quality of service for outsourcing the rest area function was 4.0 and the average effective cost of service for this function was 4.0.

Right-of-Way

The right of way function was outsourced by 97% of survey respondents. Appraisals and negotiations are heavily outsourced for the right-of-way function. Most states cited the use of on-call contracts. TxDOT outsources 30% of right-of-way acquisition while NYSDOT outsources 50% of their appraisal volume. NYSDOT also heavily outsources title searching because the Attorney General's Office has limited searching capabilities. Many DOTs stated the importance of maintaining in-house right-of-way competency. Some states are actually questioning the over-outsourcing of the right-of-way function. Kentucky stated that the over utilization of consultants is not allowing in-house staff to develop the necessary skills. This function seems to be outsourced because of workload and restrictions from limited staff. The average

effective quality of service for outsourcing the right-of-way function was 3.4 and the average effective cost of service for this function was 2.9.

Program Management

Program management is outsourced by only 33% of the responding states. Program management is generally only outsourced for very large specialized projects or studies. As previously stated, Maryland has used a General Engineering Consultant to manage “mega” projects or programs consisting of many smaller projects. NCDOT consults program managers for feasibility studies. Most states outsource this function for projects with multi-year durations. Nebraska hired a consultant to manage their Enhancement Program that is currently on its eighth year. Occasionally, program management is used for smaller projects such as VDOT’s interstate logo program. Oklahoma hired a program manager in 1997 for a statewide, state funded program. The program manager was contracted for 6 years for an \$860 million effort. The average effective quality of service for outsourcing program management was 4.4 and the average effective cost of service for this function was 3.7.

Planning

Planning was outsourced by 93% of the survey respondents. Large and/or specialized planning studies are predominately outsourced by all DOTs. Statewide long-range transportation plans are also often outsourced. Massachusetts has annual contracts with an organization that largely assists their Regional Planning Agency. Data collection, data analysis and major transportation feasibility studies are often outsourced. Maryland outsources pre-project planning, feasibility studies and airport planning studies for BWI. Missouri (MoDOT) has outsourced planning for freight movement, feasibility studies for toll roads and the development of a socioeconomic data system. NYSDOT has outsourced traffic counts and site maintenance. They have found this to be more costly than doing the work in-house but the added flexibility they experience has been worth the cost. Additionally, the outsourcing of corridor studies is prevalent in many DOTs. Agencies stated using outsourcing for planning as an extension of their staff and for special expertise. The average effective quality of service for outsourcing planning was 3.6 and the average effective cost of service for this function was 3.1.

Contract Procurement

Contract procurement was only outsourced by 7% of the survey respondents (only 2 DOTs responded to outsourcing this function). MaineDOT has a contract for development and oversight assistance on design/build projects. PennDOT supplements its in-house staff with consultants after analyzing the expertise and in-house workload. This function is rarely outsourced by DOTs because most state agencies are not willing to give up the control of selecting contractors for their projects. Often the DOTs have worked with numerous contractors in the past and have established relationships, often through partnering with trusted contractors. The average effective quality of service for outsourcing contract procurement was 3.7 and the average effective cost of service for this function was 3.1.

Geotechnical/Materials Testing

Geotechnical and materials testing was outsourced by 97% of the survey respondents. Several DOTs stated that outsourcing materials testing on construction sites is becoming more common. Maryland is planning to outsource about 50% of material laboratory testing and pavement field testing while Texas outsources only 5% of this function. Michigan cautions conflict of interest issues with consulting firms for outsourcing this function. Generally, this function is outsourced to supplement in-house workload constraints and when seeking specialized expertise. Many states have on-call geotechnical contracts with consulting firms. Other DOTs have their geotechnical work outsourced with design. Geotechnical drilling (soil boring/pavement coring) is often outsourced because of the operating costs of drilling rigs. The average effective quality of service for outsourcing geotechnical and materials testing was 3.5 and the average effective cost of service for this function was 3.0.

Environmental Studies/Permits

Environmental studies and permitting were outsourced by 93% of survey respondents. These studies are usually done by the firm providing the design services for a given project. Utah outsources 80% of their environmental studies. TxDOT outsources 100% of its environmental studies and has established statewide standards and best management practices for these studies. Most DOTs cited outsourcing all of their major environmental impact statements (EISs), environmental assessments (EAs) and National Environmental Policy Act (NEPA) studies. MoDOT outsources 95% of its EA and EIS studies. Maryland utilizes consultants for environmental plans, mitigation monitoring and remedial design. Massachusetts extensively outsourced permitting and compliance with HAZMAT, wetlands and water quality issues. This function is often outsourced due to the workload and the inability of the staff to produce the studies in-house. The average effective quality of service for outsourcing environmental studies and permitting was 3.7 and the average effective cost of service for this function was 2.9.

Design

Design has been outsourced by 100% of the survey respondents. Outsourcing the design function has historically been a DOT's most traditional use of consultants. Outsourcing typically includes road and bridge design as well as intersection and signal design, ITS and hydraulic design. Idaho stated using design consultants for years, with a marked increase brought on by increased funding provided through TEA-21. MaineDOT has developed a General Consultant Agreement which allows the agency to develop a short-list of qualified consultants that can be assigned on an as-needed basis. MoDOT maintains internal staff necessary to handle a baseline amount of design work and outsources its design services over this amount. MoDOT handles design work in this manner in case of economic downturn, only consultant services would have to be decreased rather than laying off internal staff. However, over the last decade, MoDOT's consultant usage has increased while its own staff size has decreased. The average effective quality of service for outsourcing design was 3.6 and the average effective cost of service for this function was 2.7. The following illustrates the level of outsourcing for the design function among various DOTs. Outsourcing design services ranges from a low of 30% to a high of 93% for the participating agencies.

Arizona	→ 80%
Connecticut	→ 75%
Indiana	→ 93%
Michigan	→ 65%
Nebraska	→ 30%
New York	→ 75%
Texas	→ 50%
Virginia	→ 30%
Wisconsin	→ 50%
AVERAGE	→ 61%

Other Functions

In the category of “other” functions outsourced by DOTs, 37% of the surveyed respondents commented on other functions not listed that their agency has outsourced. Many of these categories are related to the 16 functions described above. However, change management, auditing, towing, crane use, weather consulting and forecasting and landscaping were other functions that agencies have outsourced with varying degrees of success. Few DOTs mentioned establishing agreements with state colleges and universities for research needs.

2.2.2 Concerns of DOTs

Through the qualitative comments and quantitative assessment of outsourcing the various functions of state DOTs, areas of concern regarding future outsourcing practices were identified. One of the greatest concerns is losing the most competent, key personnel or the agency’s core competency. Conversely, states cited under-utilizing consultant expertise and innovation as a concern with keeping too much work in-house. Agencies expressed having insufficient data to show the public the overall financial benefits of outsourcing to be an area of concern in implementing outsourcing with public support. The decision to outsource is based on more than just cost comparisons which is often difficult to express to the general public. Also, cost comparisons between consulting firms and government agencies are difficult to assess because of the issue with accounting for overhead. DOTs expressed that making the decision to outsource is based on schedule and need, not solely on cost. DOTs articulated concern in using outsourcing as a “quick-fix” to handle high demand periods and overflow work. Finally, using outsourcing in place of hiring new employees to replenish a depleted state workforce was a major concern by nearly all state DOTs. The current trends in staffing levels and retirement of technical staff is another cause for alarm in meeting the necessary productivity levels of DOTs. State and local governments are only expected to increase their staff by 1.3% between the years 2002 and 2012. This figure, according to the Department of Labor is a decline in the staffing growth rate in comparison to the 1.8% seen in the previous ten year span from 1992 to 2002. As a result of this trend, DOT’s do not have funding for training, hiring, or completing the work with the specialized personnel required to reduce the DOT backlog (United States Department of Labor, 2004).

2.3 KyTC Advisory Committee Meetings

The advisory committee was very helpful in support of this study. There were four major committee meetings (9/04/03, 2/12/04, 9/17/04, 2/1/05), a major meeting in Frankfort (12/17/03), and two minor meetings (8/7/03, 6/5/04) plus many emails, phone calls and notes. We sincerely appreciate the advice supplied by the Advisory Committee, including a review of the draft final report. The members are noted below:

Outsourcing Study Research Advisory Committee, 2003-2005

Ken Sperry, Team Co-Chair
Director, Division of Design

Amos Hubbard, Team Co-Chair
Chief District Engineer, KyTC District 7

David Jones, Executive Director
Office of Project Development

Chuck Knowles, Executive Director
Office of System Preservation and Operations

Annette Coffey, Director
Division of Planning

Marcie Mathews, Deputy Executive Director
Office of Program, Planning and Management

Dexter Newman, Director
Division of Construction

Tom Kerns, Director
Division of Right of Way/Utilities

Greg Meredith
Chief District Engineer, KyTC District 3

Gilbert Newman, Project Manager
American Consulting Engineers

University of Kentucky Staff:

Dr. Donn E. Hancher, Professor
Civil Engineering Dept. (Construction)

Dr. Paul Goodrum, Professor
Civil Engineering Dept. (Construction)

April L. Brenneman, Research Assistant
Civil Engineering Dept. (Construction)

Robin Meagher, KTC Research Assistant
Civil Engineering Dept. (Construction)

3.0 RETIREMENT IMPACT ON KTC

The Kentucky Transportation Cabinet is planning to make two significant factor changes in the employee retirement system in 2008. First, the 2.2 retirement factor is going to change to 1.97, and second, the option of using the high 3 years of salary will end and the high 5 years will resume. These changes will cause many employees to lose money if their ages and years of service add up to 75, and they continue to work for the Cabinet after 2008. This will most likely encourage many employees to retire early.

An informal survey was conducted by The Kentucky Association of Transportation Engineers, KATE, in May of 2004 to determine how many Cabinet personnel expect to retire in, or before, 2008. Approximately 370 KATE members were polled. The results indicated that 40% of those polled plan to retire before January 1, 2009.

The Cabinet will experience a huge loss of staff and a substantial loss of experience. This loss can be lessened if action is taken before 2008 to replenish the areas that will be losing the most personnel. The UK survey that was sent in the spring of 2005 included a section on retirement. The survey asked the districts for information on the number of employees who are expected to retire by 2008, and evaluations were made of the areas that are expected to suffer the most. A summary of the review follows.

3.1 District One

District One expects to lose 20-25 total employees by 2008. These employees will come from all departments. A significant portion is engineers and supervisors, which will cause District One to suffer from a loss of experience and managerial skill. The district does not expect to have difficulties hiring new employees to fill these positions, but many will be inexperienced.

3.2 District Two

District Two is in a similar position as District One. They also expect to lose 20-25 employees. Most departments will experience some retirements. No one department will lose a significant amount more than another. The retiring employees are primarily engineers or supervisors, and will take a lot of skill with them when they leave. They responded that they can hire quality employees, but the employees will not be experienced or have knowledge of how the state agencies operate.

3.3 District Three

District Three responded that they expect to lose 60 of their 320 employees by 2008. The Pre-Construction Department will be losing all three Professional Engineers, which will cause problems if they are not able to find qualified people to fill their positions. They expect that it will be difficult to find such employees, mainly due to the state's low pay rate. The district is currently trying to fill vacancies and is also attempting to raise the starting salaries of EITs in the Cabinet. They feel they have to compensate new engineers in such a way to compete with the private sector.

3.4 District Four

In comparison to other districts, District Four will not be losing a significant number of employees to retirement. They expect to lose 2 to 3 employees; mainly from the Design crew's surveying staff. They do not anticipate having problems hiring replacements because they already have a young staff that is eager to learn and contribute.

3.5 District Five

District Five expects to lose the most employees, as they expect to lose 80 employees. The Maintenance and Construction departments will be impacted the most by these retirements. The district responded that they are unsure if they will experience difficulties hiring new employees. It depends on the economy; when private firms are laying off employees, there are plenty of candidates for the Cabinet. However, when the economy is doing well, it is hard to compete with the private sector.

3.6 District Six

District Six expects to lose 80-90 employees out of their current 275-280 employees. Their administrative department will lose 37% of their employees, ROW and utilities will lose 60%, traffic will lose 30%, construction will lose 35%, design will lose 33%, and maintenance will lose 25% of their employees. Thus, ROW and utilities will be losing the largest percentage of staff at 60%. The district has experienced some difficulties in hiring quality employees and anticipates this to continue. These problems are based on financial reasons, such as lack of competitive salaries, as well as a lack of experience in potential employees.

3.7 District Seven

District Seven expects to lose as many as 50 employees by 2008. Maintenance, Road and Pavement crews, and Construction Inspection will suffer the most from the retirements. These departments will have a substantial amount of unfilled positions. The district anticipates problems filling these positions based on lack of experience and financial reasons.

3.8 District Eight

District Eight will have 40 or more people retire. The Maintenance department will have the greatest number of retiring personnel. The district does not anticipate problems hiring new employees.

3.9 District Nine

30-50 employees will be leaving District Nine. Again, most of these employees will come from the Maintenance department. They will also need more Tech III employees in Design. The district does expect problems finding skilled, experienced workers.

3.10 District Ten

District Ten will lose approximately 25% of their current staff. Many departments will be affected as the employees are not all from the same area. The district is concerned with finding and hiring employees to fill these positions due to financial reasons. Preconstruction poses additional concerns in finding replacements because of the education requirements necessary for this area.

3.11 District Eleven

District Eleven did not complete the second outsourcing survey.

3.12 District Twelve

District Twelve did not complete the second outsourcing survey.

4.0 PROPOSED OUTSOURCING BY KY DOH DISTRICTS

All 12 districts were asked to complete an introductory Outsourcing Survey in the Fall 2004 and a more in-depth survey in the Spring 2005. Appendix B includes the first district survey and Appendix C includes the second outsourcing survey. We received all 12 completed surveys in the fall, and 10 completed surveys in the spring.

The fall survey broke the district workload into 16 functions: Planning, Design, Right-of-Way, Non-Construction Surveying, Geotechnical, Quality Assurance/Quality Verification, Construction Engineering Inspection, Maintenance-Road and Pavement Repair, Maintenance-Bridge Repair, Maintenance-Other, Snow and Ice Removal, Traffic Control and Maintenance, Equipment Purchasing for Cars, Trucks, and Heavy Equipment (individually), and Rest Areas. Maintenance-Other requested a list of what they considered to fall in this category. Usual answers were striping, tree and brush removal, and debris removal.

The second survey divided several initial functions into more specific areas. Design was divided into Design-Phase I and Design-Phase II. Right-of-Way was divided into Appraisals, Appraisal Review, Relocation, and Property Management. Materials Testing and Construction Engineering Inspection were separated from QA/QC for clarity. Maintenance was divided into Road and Pavement Repair- Patching, Striping, Guardrail Repair, and Bridge Repair. Maintenance-Mowing, Maintenance-Debris Removal and Maintenance-Ditching and Draining were also added. Equipment Purchasing was divided into Sedans/Trucks and Heavy Equipment. We also added Equipment Maintenance for Sedans/Trucks, as well as for Heavy Equipment.

The fall survey asked for the districts to list the percentage of work they were currently outsourcing in each function. The spring survey asked again, to incorporate the additional functions, and also asked for the percent they foresee their district outsourcing in the future, and the maximum percent they believe their district should ever outsource.

4.1 District One

District One completed both surveys and supplied many helpful comments. They appear to be cautious when it comes to outsourcing and believe that 17 of the 26 functions given in the second survey should not be outsourced. Despite what they feel is ideal, they are currently outsourcing a percentage of 18 of the 26 functions.

4.1.a Planning

Planning is handled by the Central Office Division of Planning. District One does not outsource any work that is not handled by the Central Office. The degree of quality received from outsourcing to consultants in the past has varied. They have had very poor to very good results. The cost of outsourcing to consultants is much higher than performing the work in-house. The costs have been higher by a factor of 3 or 4, regardless of the quality of the work. District one felt that planning could be entirely outsourced if needed, but they would prefer not to outsource any, if work could be handled by district staff.

4.1.b Design

The district is currently outsourcing 60% of their workload and believes that if it increases much beyond this amount they will lose their in-house expertise. This will impact the district's ability to manage future projects.

Phase I should not be outsourced, but the district is undecided about Phase II. They have had positive and negative experiences and have come across consultants with varied experience levels. They have found that outsourcing Phase I and II is twice the cost of doing the work in-house. The maximum amount that could be outsourced in the future is 60% for both Phases I and II, but they would prefer to keep it at 40%.

4.1.c Right of Way

District One commented that in-house acquisition enhances negotiations. Property owners prefer to deal with state employees, and doing so leads to fewer complications and delays. It is beneficial for the district to retain in-house appraisers for review and management. District One is unsure if they should outsource appraisals, but does not believe appraisal review, relocation, and property management should be outsourced. They are currently outsourcing 80% of ROW appraisals, 80% of their appraisal review, 60% of relocation, and 20% of their property management. District One believes that 100% of appraisal review can be outsourced in the future, but only 50% of the appraisals. The maximum ROW relocation should be outsourced in the future is 10%, and property management should not be outsourced at all.

District One has worked with very good appraisers in the past and has felt their cost was reasonable. The district office should complete all appraisals, but the appraiser review can be done by contractors. There wasn't any cost information given, but District One would like to keep ROW relocation and property management in-house.

4.1.d Non-Construction Surveying

This function was one that District One felt strongly about maintaining an in-house location crew to perform day-to-day requests from legal and utilities for ROW location. District One does not believe it should be outsourced at all.

4.1.e Geotechnical Exploration

The district is currently outsourcing 80% of their geotechnical work. They were, however, undecided on the amount that is most beneficial to outsource. They believe that the quality is always better in-house, provided they are properly staffed. In the event that they are not staffed to handle this area, they responded that they could outsource 100% of the function in the future.

4.1.f Construction Materials Testing - QA/QC

This area should not be outsourced, if possible. They recommend that 0% of this function should be outsourced, but realize that it might not be feasible to do so. District One said that the desirable percentage to outsource materials testing was 0%, but the maximum that could be outsourced in the future is 100%. The department currently has the paving contractors do outside testing, which they then submit to the department. Regardless of their current practices, they believe all testing should be done in-house. District One is currently outsourcing 30% of QA/QC, but would prefer to keep outsourcing at 0%. The maximum this function could be outsourced in the future is 100%. Quality control is now performed on larger asphalt and painting projects. Although it is occurring more frequently in the past few years, they do not believe this is the best option. The Department should maintain quality control because control should be vested in the owner and outsourcing only costs more in the long run.

4.1.g Construction Engineering Inspection

District One's construction staff can handle the current work load, and are not outsourcing any of inspection. If workload increases, the district recommends hiring more inspectors and not outsourcing. The maximum percentage this district feels inspection should be outsourced in the future is 0%. They have not outsourced inspection for many years, but when they did they experienced higher costs than handling the work in-house.

4.1.h Maintenance - Road and Pavement Repair

Road and pavement repair is outsourced significantly by District One. They are currently outsourcing 30% of patching, 100% of striping, and 100% of guardrail repair. Machine patching, guardrail repair, and specialty work (including mud jacking, concrete pavement leveling, and crack sealing) should continue to be outsourced. The quality of machine patching has varied depending on the contractor's workload, but overall has been good. The cost of outsourcing has been reasonable, but other factors need to be considered, such as extra costs in claims when work is not accomplished. The district does their own pothole patching and has a small paving machine that is used for short patches. Despite the positive return on quality work by contractors, they do not recommend outsourcing more than 40% of patching. Stripping and guardrail repair can

continue to be outsourced 100%, due to the high quality of work received at a reasonable price.

4.1.i Maintenance - Bridge Repair

District One is currently outsourcing 20% of their overall bridge repair, and responded that the maximum percentage it should be outsourced is 30%. This includes inspection of fracture critical bridges, underwater inspection, and major bridge repairs, which 12.5%, 100%, and 100% are currently outsourced, respectively. Outsourcing these projects is necessary due to current staff size. It is expensive to outsource this function, but the specialized training and equipment needed for underwater inspection and major bridge repairs make it a necessity.

4.1.j Maintenance - Other

Other maintenance functions are outsourced significantly in District One. Mowing is outsourced 50%, hazardous tree removal is outsourced 90%, and street sweeping and vacuuming of drainage boxes is outsourced 90%. The mowing quality in the past has been good, but the district is currently using a mower who only has experience mowing his personal farm. The cost is higher than in-house mowing, but due to staff shortages, it could increase to a maximum of 100% outsourced in the future.

Debris removal is outsourced 65%, with a possible future maximum of 85%. Outsourcing is cost effective because of the high cost to buy and maintain the large equipment necessary for large tree removal and debris removal in streams.

Ditching and draining is not currently outsourced, but could be outsourced a maximum of 50% if a need arises. District One is not permitted to contract out ditching and draining as a bid on an annual basis. They would have to rent equipment with operators and use in-house materials. This would not be ideal because in-house personnel would still be needed for traffic control, and providing and hauling material.

4.1.k Snow and Ice Removal

Snow and Ice Removal is not currently outsourced, in part because the district has been unsuccessful in getting bids in recent years. The district attributes this to the district's rural location. They recommend that outsourcing should stay at or below 25% if a smaller staff requires outsourcing in the future. When the district did have a contract in the past, they found that outsourcing snow and ice removal was more expensive than doing it in-house.

4.1.l Traffic Control Maintenance/Upgrade

District One currently handles all of their traffic control maintenance and upgrades. They do not believe it should be outsourced at all. They have a qualified staff that is able to carryout the work and maintain the expected quality.

4.1.m Equipment Purchasing/Maintenance

The purchasing of sedans, trucks, and heavy equipment is handled by the Central Office. The Central Office also handles the maintenance of sedans and pickups, but the district does 20% of heavy equipment in-house. This percentage may increase due to a reduction of mechanics. Once an appropriate number of mechanics is reached, if feasible, the percentage that maintenance is outsourced may return to around 20%. If it is

not feasible to hire mechanics, the district responded that heavy equipment maintenance may be outsourced a maximum of 100%.

4.1.n Rest Areas

Rest Areas are not outsourced by District One, nor do they believe they should be. Doing so is considered impractical because their rest area and welcome center is historic property and contains many antiques.

4.1.o Other Functions

No comments were made for other functions outsourced.

4.2 District Two

District Two completed both surveys, which showed that they believe 14 of the 26 functions should be outsourced, and are currently outsourcing some percentage of 20 of the 26 functions.

4.2.a Planning

District Two outsources 20% of planning, including 80% of their scoping studies. They have been very pleased with the results and recommend outsourcing future scoping studies. The unscheduled projects list is managed and maintained by the Cabinet and should continue to be done so. Traffic counts are done in-house. Despite their current outsourcing percentage of 20%, they do not believe it is best practice to outsource more than 15%.

4.2.b Design

10% of design projects, both for Phase I and II, is outsourced. However, 50% of the budget for design in both phases is outsourced. District Two has a small, but effective, design group. In-house projects include bridge replacements, intersection improvements, and HES. Typically, the larger and more complex projects are outsourced.

The district recommends that Phase I and II be outsourced, but no more than 75%, with the ideal being the current amount they are outsourcing. Both phases have received results of varied quality, and believe that contracting design is twice the cost of doing the work with in-house personnel.

4.2.c Right of Way

The district, in addition to the design crew, has a small, but very effective ROW staff. They do not, however, have a staff appraiser, which is causing numerous problems. They are experiencing 4 to 6 month delays in getting consultant appraisers under contract. There will always be a need for appraising and buying ROW, so this expertise should be maintained by keeping it in-house. Doing so expedites the entire ROW process. The district has a reputation for ensuring customer satisfaction. Contractors do not have the same relationship with customers, and do not always take the time to develop such a relationship because they are paid when the parcel is signed or turned in for suit. District Two believes it is more cost effective to have a staff capable of appraisal and buying.

Appraisal results have ranged from very good to very poor when outsourced. The district has had to outsource 100% of appraisals in the past, but anticipates hiring a staff appraiser in the next few months. It is estimated that handling appraisals in-house is about 75% of the cost of outsourcing. They would prefer to outsource 20% or less of appraisals. Outsourcing appraisal review has resulted in higher quality work, and are currently outsourced 100%. However, the ideal amount to outsource is 50%.

ROW relocation and ROW property management are not outsourced by the district nor do they believe it should be. In-house personnel produce quality work and can handle current levels of work.

4.2.d Non-Construction Surveying

10% of non-construction surveying projects are outsourced, which accounts for 50% of the total surveying budget. The district responded that their current practice is their desirable percentage, but the maximum the function should ever be outsourced is 75%. The district handles the smaller projects and surveys all their in-house design work. The district employs a two man surveying crew for this work. When considering outsourced projects, the district reported that the hours turned in from contractors seem excessive.

4.2.e Geotechnical Exploration

The district's geotechnical exploration is handled by the Central Office. No additional information was provided.

4.2.f Construction Materials Testing – QA/QC

All materials testing is done in-house, while 30% of QA/QC is outsourced. The district does not recommend outsourcing testing, but believe the maximum QA/QC should be outsourced is 90%. They stated that having personnel employed by the owner ensures the testing will be done without bias and prejudice.

QA/QC would preferably remain in-house, but their decreasing staff is not allowing it. Despite what they would like to do, there isn't a choice not to outsource more. The cost of QA/QC is usually part of the contract cost.

4.2.g Construction Engineering Inspection

District Two supplied a strong argument against outsourcing inspection. They wish to keep outsourcing to a minimum and only outsource extremely specialized and non-routine projects. The district does not outsource this function. Contracting inspection is more expensive and doesn't allow the cabinet to gain or maintain experience. If downsizing is the major reason for outsourcing, perhaps more should be done to increase staff levels.

4.2.h Maintenance – Road and Pavement Repair

Due to a lack of equipment and manpower, all of the district's major paving and pavement repairs are outsourced through construction contracts. This amounts to 30% of their total patching workload. 60% is the desired amount to outsource, and the maximum is 90%. Pothole patching should remain a district function. The cost of outsourcing is reasonable when compared with the additional time it would take in-house staff to carryout the same amount of work. Large projects would require too much of the district's time, time that should be used for other regular maintenance activities.

Striping is outsourced significantly at 90%, which is the maximum that the district recommends to outsource. There is room for improvement in contractors' quality, especially reflectivity of the striping job.

Guardrail repair is currently outsourced 100%, which is the maximum the district feels should be outsourced. The district lacks the expertise and equipment to repair or construct guardrails. The materials are the largest cost consideration when looking at this function. This cost is balanced with the reasonable cost and excellent quality of the district's current contractor.

4.2.i Maintenance – Bridge Repair

The district currently outsources 20% of their bridge repair work, which includes painting and overlays. They expressed the need to maintain a level of expertise. An in-house bridge crew is necessary to respond to emergencies and general maintenance needs. Outsourcing may have to increase due to deteriorating expertise in the area. District Two does not believe bridge repair should be outsourced more than 50% at any time.

4.2.j. Maintenance - Other

District Two outsources parkway/interstate mowing, excavation work, tree removal, and pavement milling. In-house crews do well mowing roads in residential areas and deliver an aesthetically pleasing mowing job, as the general public expects. 20% of mowing is outsourced, but the maximum amount mowing could be outsourced is 100%. The district can do the mowing cheaper, with the biggest expense being bush hog maintenance.

Debris removal is currently part of contract mowing. Litter pickup is primarily done by local jail pick-ups. The district has had more success and quicker responses when they handle large tree removals and rock falls themselves.

Ditching and draining should not be outsourced according to the district. Aesthetics and customer satisfaction are the primary reasons they feel it should remain an in-house function. The district has proven their dedication to doing a thorough job, whereas contractors have not consistently delivered the same level of quality. The district does not outsource any of their ditching and draining. Although it is not desirable to outsource this function at all, they believe the maximum it could be outsourced is 100%.

4.2.k Snow and Ice Removal

All of the district's snow and ice removal is handled in-house. They do not believe any of this function should be outsourced, because of the importance of the safety aspects. The district needs to maintain control over this function by using its own drivers to ensure reliability. Reliability of contractors is unsure because it is difficult to find skilled employees at their low pay grades.

4.2.l Traffic Control Maintenance/Upgrade

The district is currently outsourcing 70% of their traffic control maintenance and upgrades. They would prefer to maintain the outsourcing level at 60%. The district does not have the equipment to set new support poles, so outsourcing will need to continue. Installing LED signal heads should free the district's personnel and allow them to do more upgrades to existing traffic control devices. The cost of outsourcing this function has increased due to the use of a new electrical maintenance contract, which is due in part to the increased cost of traffic control.

4.2.m Equipment Purchasing/Maintenance

The purchasing of sedans, trucks, and heavy equipment is handled by Fleet Management. The district only handles the maintenance of the heavy equipment due to a

low number of mechanics. As it is, they are outsourcing 20% of their heavy equipment maintenance. It is currently more efficient to outsource this function. The district expressed difficulty in hiring skilled mechanics at the low pay grade. Any repairs that are beyond the district's expertise are outsourced. Outsourcing will continue to rise as more mechanics retire.

4.2.n Rest Areas

District Two is currently outsourcing 80% of their rest area functions, but would prefer to outsource 100%. Items that are outsourced are janitorial services and mowing. The district believes rest areas should be commercialized because they are spending too much of their budget to maintain them. The need for rest areas is continuing to diminish as the number of travel plazas at exits increases. They suggest evaluating the benefits of travel plazas, such as ones on the Florida Turnpike. Gas companies and restaurants own these plazas and use their profits to maintain them. Following Florida's lead, the districts would charge rent for the land, stopping the excessive spending of budgets on rest areas.

4.2.o Other Functions

No comments were made for other functions outsourced.

4.3 District Three

District Three is outsourcing a portion of many of the listed functions, currently outsourcing a percentage of 21 of the 26 functions. Staff size and workload are forcing them to outsource some functions that they feel should be carried out by district personnel. They would prefer to partially outsource only 15 of the 26 functions.

4.3.a Planning

Planning is currently outsourced with the Area Development Districts in the long range planning activity. The district may increase outsourcing to private consultants for project planning activities. 30% of District Three's workload is outsourced. Overall, the district believes a portion of planning should be outsourced, but in order for the district to receive quality results, there must be strong oversight of the contracted work. Although the cost of outsourcing is greater than using in-house forces, lack of state personnel may require more outsourcing.

4.3.b Design

Over half of Phase I and II Design are outsourced. 60% of Phase I and 55% of Phase II are currently outsourced, while the desirable percentage to outsource for both is 75%. District Three currently has a lot of experience in this function, but upcoming retirements will result in a large loss of this experience. The cost of outsourcing design is twice the cost of doing the work in-house, but at times it is a necessary expense.

4.3.c Right of Way

District Three is utilizing private contractors for 80% of their ROW appraisals and believes they can outsource up to 90% and achieve quality results. The district currently has a Unit Leader with 14 years of complex appraisal experience and two agents with experience in moderate to non-complex acquisitions to successfully handle the work they do not outsource. Unlike design, the cost comparison between outsourced appraisals and in-house is nominal. There are typically more up-front costs with fee appraisers, however, the costs even out over the course of the entire process. This is due to the fact that fee appraisals are usually completed sooner.

80% of appraisal review is outsourced, but District Three would prefer, if they must outsource at all, to outsource only 55%. The district has a Unit Leader with approximately 6 years of experience, but he is currently in the process of renewing his reviewer status. The cost difference between in-house and outsourced work is also nominal, and should not be a large factor in determining how much work to outsource.

The district responded that 0-10% of their ROW relocation work is outsourced. They have an experienced staff, one of whom has 8 years experience. The district prefers to handle all relocation duties to maintain uniformity required in making the Fair Market Value and relocation offers. ROW property management is another area that is not outsourced, nor does the district believe it should be in the future. They noted that this area of ROW has always been handled by district staff across the state, and should remain that way.

4.3.d Non-Construction Surveying

District Three is in favor of outsourcing non-construction surveying. They only have two people in their surveying crew, neither of which is a Registered Land Surveyor. Despite the small crew, new and up-to-date equipment allows the crew to handle 55% of the district's workload. 54% of non-construction surveying is outsourced. Consultants have performed well on the majority of work and most are registered. The cost is about twice the cost of having the district's survey crew complete the work, however, they may increase to outsourcing 75% of their work in the future.

4.3.e Geotechnical Exploration

Geotechnical Exploration is handled by the geotechnical branch of the Central Office in Frankfort. District Three does not do any geotechnical work themselves.

4.3.f Construction Materials Testing - QA/QC

District Three believes materials testing and quality control should be outsourced if needed. They have had poor to fair results from outsourcing and felt the cost was high. Despite this, they are currently outsourcing 20% of this function, and reported that it is desirable to outsource as much as 75% if the need arises. The district did not include much detail concerning the positive experiences they have received by outsourcing.

4.3.g Construction Engineering Inspection

The district does not recommend that inspection be outsourced. They are not currently outsourcing any of this function and would like this number to remain the same.

4.3.h Maintenance - Road and Pavement Repair

District Three is outsourcing 90% of patching, and believes this is a desirable percentage. They have had varied results, with the quality ranging from excellent to poor depending on the pavement crew. They commented that the work was reasonably priced 6 to 7 years ago, but has substantially risen in the last few years. An estimation of the cost increase was included. Patching was approximately \$28/ton seven years ago, but is approximately \$50/ton today.

Striping quality has been excellent in the district. This high level of quality is based on the retro reflectivity numbers they have experienced. The district is outsourcing 100% of their striping work and feel there isn't any reason to decrease the percentage. The striping contract has an 'incentive' category, in which the contractor has consistently scored. Similar to patching cost increases, striping has increased in cost by 20-25% over the last five to six years.

Guardrail repair is also highly outsourced. The district is currently outsourcing 80%, and stated the maximum that it could be outsourced in the future is 100%. They have had positive results from contractors. Contractors handle the difficult end treatments or extensive repairs, while simple repairs are handled in-house. The prices have been reasonable in the past; however they have increased 43% over last year's contract.

4.3.i Maintenance - Bridge Repair

This function should be outsourced, and the district is currently outsourcing 40%. The desirable amount to outsource is 60%, but the reported maximum was 100%. District Three has their own bridge crew that handles small jobs, while contractors handle the bigger jobs. The district's bridge crew provides excellent quality, while the contractors produce average work. The cost of outsourcing is reasonable.

4.3.j Maintenance - Other

District Three outsources mowing and tree trimming. They have found that contract mowing does not meet the quality of their own, and do not think it should be outsourced. Citizens have also reported that they are not as pleased with contractors' mowing work. They are currently outsourcing 65%, but the desirable amount is only 25%.

Debris removal is outsourced even less in District Three. They are outsourcing only 5% and said it should not be outsourced any more than 5%. They contract the sweeping and subsequent debris removal for the median barrier wall on I-65. This contract has produced good results with reasonable cost. The service is only needed 4 to 5 days per year, which makes the purchase of their own sweeper unreasonable.

Ditching and draining is also outsourced only 5%, but the desirable amount reported was 60%. The contractors have had trouble working within their limited ROW areas. The ditched areas eroded significantly prior to seeding. They were not able to comment on the cost as they haven't outsourced enough to compare.

4.3.k Snow and Ice Removal

Only 10% of snow and ice removal is outsourced and they would prefer not to outsource any of it. District Three does not believe snow and ice removal should be outsourced. The contractors are slow in response and often have faulty equipment. Additionally, the contractors do not communicate well or efficiently with the district. The costs are reasonable, but the district thinks they would increase if they lose the ability to self perform snow and ice removal.

4.3.l Traffic Control Maintenance/Upgrade

Traffic control maintenance/upgrade is significantly outsourced. 80% of this function is handled by contractors, which District Three responded was the desirable amount to outsource. The construction aspect of outsourcing has bid well, but they have done very little outsourcing of signal maintenance. The costs have increased significantly under the current electrical contract. They expect the contract to cost twice as much as last year's total.

4.3.m Equipment Purchasing and Maintenance

Equipment purchasing for sedans and trucks is handled by Fleet Management in Frankfort. Purchasing of heavy equipment is handled by the Division of Equipment. No additional comments were provided.

The district is outsourcing 100% of equipment maintenance for sedans and trucks to Fleet Management. They believe this is the optimal amount to outsource as the work is performed well. Fleet Management does not allow the district to use quick automotive services stations for oil changes, so it now takes up to two days to perform this task. All

costs are covered by Fleet. They do not believe that maintenance of heavy equipment should be outsourced. They are able to do their own repairs with above average quality and reasonable cost. They are not outsourcing any of this work at the present time.

4.3.n Rest Areas

Rest Areas are outsourced completely. Their contractors perform very well. A recent surprise inspection rated the cleanliness at 100%, 100%, and 98.2%. The cost is reasonable, and the district will continue to outsource 100% of this function.

4.3.o Other Functions

No comments were made for other functions outsourced.

4.4 District Four

District Four is split on the number of functions they feel should be outsourced. They responded that 11 functions should not, and 10 should be outsourced. They were undecided on the remaining 5 functions. They are currently outsourcing a percentage of 17 of the 26 total functions, despite only wanting to outsource 10.

4.4.a Planning

The district is in favor of outsourcing large planning studies, but does not think everyday planning or small studies should be outsourced. They are currently outsourcing 10% of their work, and do not believe anymore than 25% should ever be outsourced. Large planning studies are outsourced due to lack of district planning staff and lack of resources to do the necessary traffic forecasting. Consultants are able to provide detailed information and quality work at a reasonable price.

4.4.b Design

Outsourcing percentages for Design are based on the current volume of work. The district is currently outsourcing 80% of Phases I and II (based on dollar amount, not volume of work), but expects the number to decrease in the future. They would prefer to keep this number at 50% or below for Phase I, and 90% for Phase II.

If staffing levels and work load permitted, they would rather not outsource Phase I. They have a fairly new staff supporting the pre-construction engineers that need to gain more experience. Project costs for outsourcing Phase I are typically at \$1 million or below. Unlike Phase I, District Four does think Phase II should be outsourced.

4.4.c Right of Way

District Four does not have a full right of way staff at the present time and expects to increase the amount of work they are outsourcing in the future. They are currently outsourcing 10% of ROW appraisals, but believe as much as 100% can be outsourced and still maintain expected quality. Their staff has as much as seven years of experience in appraisals. The ROW supervisor has experience with appraising million dollar takes, while the staff under him has \$200,000 or less takes experience. They are not currently outsourcing any of their appraisal review, but responded that as much as 100% of this function could be outsourced.

Right of way relocation should not be outsourced, and 100% of this work is handled by the district. The district is currently outsourcing 9% of ROW Property Management, but did not provide any additional information.

4.4.d Non-Construction Surveying

Based on dollar amount, 75% of non-construction surveying is outsourced. The district does not, however, think this function should be outsourced. They have a district surveying crew that typically handles ROW staking. All of the district's needs can be met by district personnel, but did not say the reason for outsourcing 75% of their total dollar amount for this function.

4.4.e Geotechnical Exploration

Geotechnical Exploration is handled by the Central Office. The district does not oversee this function. District Four would prefer for state forces to be used for all such needs.

4.4.f Construction Materials Testing - QA/QC

The district does not believe this function should be outsourced. Manmade materials are tested 100% by KTC and 5% of other materials; including asphalt and concrete are outsourced. This may increase to 100% in the future, despite their stated preferences. The district would prefer not to outsource because accountability is lost without KTC involvement in the process.

QA/QC should also remain an in-house function. The district is outsourcing 5%. According to test results, they are receiving a good or excellent product. However, the tests never seem to show a poor or inferior product.

4.4.g Construction Engineering Inspection

The district does not outsource this function and does not believe they should. They may have to start outsourcing due to a lack of personnel. They are concerned with the level of expertise they will receive from consultants, and how much the district will lose by outsourcing.

4.4.h Road and Pavement Repair

District Four handles 10% of their patching work, and outsources the remaining 90%. They believe this is a desirable amount, and the maximum it should be outsourced. The district's crew is only able to do a minimal amount of work due to personnel levels. Staff size makes outsourcing a large amount of work necessary. The cost to outsource is similar to that of doing the work in-house. Striping and guardrail repair are outsourced 100%.

4.4.i Maintenance - Bridge Repair

All of bridge repair maintenance is handled by district personnel. The district is not currently outsourcing any of this function and does not recommend doing so. State forces are highly capable of minor repairs. They did not include overlays and major repairs in their response, so it is unclear if the Central Office or contractors are performing this work.

4.4.j Maintenance - Other

90% of mowing is outsourced due to current staff level. The price is similar to doing the work in-house. Debris removal is included with contract mowing, both of which the district feels should be outsourced. Ditching and draining is not currently being outsourced.

4.4.k Snow and Ice Removal

15% of snow and ice removal is outsourced. The district believes both contractors and state forces are highly capable, and that the work should be outsourced up to 20%.

4.4.l Traffic Control Maintenance/Upgrade

10% of traffic control maintenance/upgrade is outsourced. This is the maximum amount that should be outsourced, and if the need didn't exist, the district would prefer not outsource more than 10%. Normal signage is handled by the district, while interstate/parkway informational signs are 100% outsourced. Outsourcing has resulted in high quality work, but the cost is high. There have also been problems with the contractors responding to an emergency in timely manner.

4.4.m Equipment Purchasing/Maintenance

District Four believes that purchasing of all cars, trucks, and heavy equipment should be handled by the state. The Central Office knows what the districts' need and are able to provide a quality service. There isn't any need to use contractors.

Maintenance for sedans and trucks is outsourced 100%. Although mechanics in the district are highly capable, current workloads and low staff levels require outsourcing. Only 15% of heavy equipment maintenance is outsourced, which is usually the larger, more complex work.

4.4.n Rest Areas

All of the work associated with rest areas is contracted out. The district conducts inspections, but everything else is done by contract. They have had positive results with contractors and expect to continue outsourcing this function.

4.4.o Other Functions

No comments were made for other functions outsourced.

4.5 District Five

District Five responded to both of the outsourcing surveys. The district was undecided on outsourcing 10 of the 26 functions (38%) and was opposed to outsourcing only two of the functions (8%). The district gave the impression that the majority of the functions could be outsourced which accounts for 14 of the functions (54%). District Five has the general opinion of outsourcing as “you get what you pay for.” However, they have found that in many instances with contract work, you do not have the loyalty that you have with state employees. They feel that the work gets accomplished but the public does not get served quite to the level they expect.

4.5.a Planning

District Five is currently outsourcing 30% of their planning work but is undecided as to whether or not this function should be outsourced. The survey respondents cited the desirable amount of planning to be outsourced as 50% while 70% is the maximum percentage that this function could be outsourced. District Five stated this function will need to be outsourced more in the future because of the lack of personnel. The studies for future traffic needs in urban areas require an increased number of personnel that are not available to the district. The quality of planning service in past performances has ranged from average to good depending upon the firm contracted to do the work. District Five stated that their experience with outsourcing planning has been expensive but no cost comparisons were supplied with the survey.

4.5.b Design

District Five is currently outsourcing 50% of their Phase I and Phase II Design work. Again, the district is undecided on whether this function should be outsourced in the future. They did state that the desired amount Phase I should be outsourced is 70% and the desired amount for Phase II is 60%. The maximum amount Phase I should be outsourced is 80% while 60% is the stated maximum for Phase II Design. On the first survey, the respondents stated that there would be less need for outsourcing design if there were less design work for the district. The quality of work in outsourcing Phase I Design has been traditionally based on the firm performing the work and the cost has been expensive. However, with fewer employees, the district realizes that outsourcing Phase I Design becomes a necessity. For Phase II Design, the quality of work from consultants has historically been suitable but expensive.

4.5.c Right of Way

The right-of-way function was broken down into appraisals, appraisal review, relocation, and property management survey categories. Overall, the district stated that if there were less work and responsibility on the part of the district for the right-of-way function, there would obviously be less need to outsource the function.

District Five stated that right-of-way appraisals should not be outsourced. They are however currently outsourcing 30% of their appraisals and feel that the maximum this function could be outsourced is 50%. With regard to the quality of outsourcing appraisals, the district stated that most of their problems arise from buying right-of-way contracts. They have found that the contract buyers do not have the loyalty that state employees have and seldom have experience working with property owners. The district stated that the cost is more to outsource this function than to perform the work in-house.

With appraisal review, the district feels that the function should be outsourced, at a maximum of 100%. They are currently outsourcing 70% of their appraisal reviews which they also feel to be the desired amount this function should be outsourced. Outsourcing this function has historically worked well for the district because it is difficult to maintain an appraisal staff within the district. They have found the cost to be reasonable.

District Five feels that right-of-way relocation should not be outsourced although they are currently outsourcing 30% of this function. The maximum possible percentage this function could be outsourced is 50%. With regard to quality, performing the work in-house has better met the needs of the public and they have found outsourcing relocation work to be rather expensive.

District Five is undecided about outsourcing the property management aspect of the right-of-way function. They are not currently outsourcing this function and do not desire to do so in the future. However, the district feels that if is necessary, property management could be outsourced at 50%.

4.5.d Non-Construction Surveying

Non-construction surveying is currently being outsourced by 65%. District Five feels that this function should be outsourced and at a desirable and maximum level of 75%. Also, the district stated again that the less work they are responsible for with regard to non-construction surveying, the less the district will need to outsource. District Five identified future retirement of their staff as a need to outsource non-construction surveying. Historically, the quality of work has been good but the cost of outsourcing is more that in-house, although acceptable to the district.

4.5.e Geotechnical Exploration

Geotechnical exploration is currently being 65% outsourced. District Five is undecided about outsourcing this function but found the desired level of outsourcing to be at 75%. This percentage is also the maximum the district feels geotechnical exploration should be outsourced. They have found the quality of work outsourced to be good and the cost to be more than expected in-house. The district does however realize that it is expensive to keep a full crew in-house to perform this work.

4.5.f Construction Materials Testing – QA/QC

District Five is also undecided about outsourcing construction materials testing and QA/QC. They have noticed a trend in the construction industry to require contractors to perform more of this work. District Five is not currently outsourcing construction materials testing but does desire to outsource 30%. This is also the maximum percentage they would like to outsource. The district made no comment regarding the quality of service but did state the cost of materials testing is difficult to determine as with many outsourced functions because there has to be some method of quality control for the outsourced work. The district is also not currently outsourcing QA/QC but would like to do so at 40%. They feel the maximum this function should be outsourced is 50%. The district made no comment regarding the quality of outsourcing QA/QC. As with materials testing, the district feels that there has to be some method of quality control for the contractor.

4.5.g Construction Engineering Inspection

Construction engineering inspection is not currently being outsourced in District Five. The district is undecided about outsourcing this function but did say that in the distant future; this function may need to be outsourced, giving reference to the Ohio River Bridges Project. The district stated that 50% would be the maximum this function could be outsourced. Because the district has not had experience with outsourcing construction engineering inspection, they could not comment on quality. The survey respondents did recognize the need for a method to assure that the person contracted to inspect the work is doing their job properly.

4.5.h Maintenance - Road and Pavement Repair

Road maintenance and pavement repair was broken down into the survey categories of patching, striping, and guardrail repair. District Five stated that with a decrease in the number of employees, this function will require outsourcing in order to complete all of the work.

District Five feels that patching should be outsourced in their district and is currently outsourcing 20% of this function. They did not comment on the quality or cost of outsourcing this function nor did they provide a desirable or maximum level of outsourcing for patching maintenance.

The district feels that striping should also be an outsourced task. District Five is currently outsourcing 60% of their striping work and cited a maximum and desirable level of outsourcing of 80%. In commenting on the quality of work, outsourcing striping has proved to be effective. District Five is currently making arrangements with local governments to establish contracts for striping. The district has made similar agreements with local governments for snow and ice removal which have proved beneficial. From a cost perspective, it is cheaper to outsource the function than to own and maintain a striper; however, the convenience is lost when another agency handles the striping.

District Five also feels that guardrail repair should be an outsourced task. They are outsourcing 90% of their guardrail repair and identified a desired level of 80% and a maximum level of 95%. The district has historically received quality work when outsourcing guardrail repair. Limited resources demand that striping continue to be outsourced.

4.5.i Maintenance - Bridge Repair

District Five is also in support of outsourcing bridge repair maintenance. They are currently outsourcing 40% of their bridge repair and are realizing that more contracts will be required if the number of employees in the district continues to decline. The district cited a desirable and maximum level of outsourcing this function to be 75%. With regard to quality, the district has been pleased, especially with their project contracts for bridge repair. They also stated that the problem with general maintenance contracting is the lack of quick response time. The cost of contracting bridge repair has been suitable to the agency.

4.5.j Maintenance – Other

District Five identified mowing, drain cleaning, sweeping and signals as other areas of the maintenance function that have been contracted out. The district again stated that less agency employees will require additional contracts in order to keep up with the

workload. The survey broke this maintenance function down into the categories of mowing, debris removal, and ditching and draining. They felt that all three of these categories should be outsourced.

The district is currently outsourcing 80% of their mowing needs and identified a desirable level of outsourcing of 95% and a maximum level of 100%. The quality of the outsourced mowing function has been good. Additionally, the district stated that with employee resources at a minimum, the only way to meet the needs of the public is to contract out the work.

District Five is not currently outsourcing debris removal but desires to outsource 70% of this function, with a 100% maximum. They do feel that outsourcing debris removal will become a necessity in the future, regardless of the cost.

Also, ditching and draining is not currently being outsourced but the district desires to outsource 65% of the work, with a 90% maximum. Cost is currently the controlling factor as to why District Five does not outsource ditching and draining. They are currently negotiating with the Louisville Metro Government to take over the responsibility of ditching and draining in Jefferson County.

4.5.k Snow and Ice Removal

District Five also feels that snow and ice removal should be contracted out to local governments, especially in the metropolitan areas. They are currently outsourcing 65% of snow and ice removal and have established their desired and maximum level of outsourcing to be 75%. With regard to quality, outsourcing snow and ice removal has been very good in the past. In considering costs, it is cheaper to outsource the work rather than keeping a large inventory of trucks and employees, especially during warmer winters when the equipment is not as heavily used. The district did say that costs can escalate during heavy winter snow and ice events.

4.5.l Traffic Control Maintenance/Upgrade

District Five feels that traffic control maintenance and upgrade should be outsourced. They are currently outsourcing 70% of this function and would like to increase that to 80%. The maximum percentage they feel comfortable outsourcing is 90%. Approximately 45% of District Five's signals are maintained by the Louisville Metro Government. They are now negotiating with Metro to take over all maintenance of signals in Jefferson County. The quality they have experienced has been very good.

4.5.m Equipment Purchasing/Maintenance

Equipment outsourcing was broken down into purchasing and maintenance, some of which is outsourced by Fleet Management. Currently, the district is outsourcing all of their sedan, pick-up and heavy equipment purchasing to the Central Office. Although they feel it is cheaper to have the Central Office oversee the purchasing of all of the equipment, they believe it would be more convenient for the districts to have control over this function. The district is undecided about outsourcing the purchasing of their sedans, trucks and heavy equipment. The maintenance of sedans and pick-ups is currently being 90% outsourced which is also their desired and maximum amount. The quality of outsourcing the maintenance of sedans and trucks has been very good. Only 10% of heavy equipment maintenance is being outsourced but the district would like to increase this to 50%. Also, they feel that 50% is the maximum amount this function should be

outsourced. With regard to the quality, outsourcing the maintenance of heavy equipment is good. It is expensive but the lack of resources needed to complete the task requires the district to outsource.

4.5.n Rest Areas

All services regarding rest areas are currently contracted out by District Five. The district feels that they do not have the personnel to do this work and will continue to outsource 100% of the work. The quality they receive has been very good and the cost has been suitable for the work.

4.5.o Other Functions

No comments were made for other functions outsourced.

4.6 District Six

District Six responded to both surveys. The district outsources some portion of 24 of the 26 functions. This number includes functions that are handled by the central office. Despite their current practices, they believe only 14 functions should be outsourced if possible. Their comments on current and desired outsourcing practices are shown below.

4.6.a Planning

District Six only outsources 5% of planning. The first survey stated that the only areas suitable for outsourcing are traffic counts and highway characteristics (lanes, width, signals, shoulders, etc) for inventory purposes. Although the district is able to handle the remaining 95% of their workload, 10% is their desired amount to outsource. They have received acceptable to good quality, but believe the cost is 30-50% higher than doing it in-house.

4.6.b Design

District Six is currently outsourcing 90% of both Phase I and Phase II Design. They believe Phase I should not, while Phase II should be outsourced. The district would prefer to outsource 50% of Phase I and 75% of Phase II, instead of their current 90%. Outsourcing Phase I yielded fair results with respect to quality, and Phase II yielded good results. Despite their preferred outsourcing percentages, the district anticipates continuing to outsource about 90% of their design work, assuming a revenue stream is found. Otherwise, they will be outsourcing less in the future.

4.6.c Right of Way

The district is outsourcing 50% of ROW appraisal, which is also their desirable percentage. The maximum percentage appraisals should be outsourced in District Six is 100%. They have received acceptable to average results and believe this function should be outsourced.

The district does not believe that ROW appraisal review should be outsourced. They are currently outsourcing 25%, which is also their desired amount. Unlike appraisals, they believe the maximum appraisal review should be outsourced is 50%. They have received average or below average results and say it is more expensive than doing the work in-house.

District Six is undecided on outsourcing ROW relocation. They are currently outsourcing 20%, which is their desired amount, and believe no more than 50% should ever be outsourced. They have received poor to average quality in outsourcing this function, and also believe it to be more expensive.

The property management branch of ROW is not currently outsourced, and the district does not believe it should be. If it becomes necessary to do so, they do not believe it should ever be outsourced more than 50%. They did not have quality or cost experience in outsourcing this function.

4.6.d Non-Construction Surveying

District Six is currently outsourcing 20% of their non-construction surveying and desires to outsource as much as 90%, which is also the maximum amount this function should be outsourced. They have received good results in outsourcing this function, although it is more costly.

4.6.e Geotechnical Exploration

The first survey state that the district outsources 100% of this function to consultants or the Central Office. The first survey also stated that they no longer own any drilling equipment so all future work will be outsourced. The second survey stated that they outsource 70% of this function and would prefer to outsource only 50%. They did not mention equipment needs or shortages in the second survey.

4.6.f Construction Materials Testing – QA/QC

District Six currently outsources 10% of their construction materials testing and QA/QC. The first survey said that they have been outsourcing asphalt material testing for some time by requiring the producer to test his material through a QA/QC program with good success. The current trend is to expand this to other construction materials, and this has occurred with concrete materials on some projects. The district expects this trend to continue. District Six stated that QA/QC seems to be of a higher quality when performed by an independent third party. The district would prefer to outsource 20% of this function, and believe no more than 50% should ever be outsourced.

4.6.g Construction Engineering Inspection

Construction engineering and inspection is not currently being outsourced in the district. The survey respondents stated that the department will have to consider outsourcing this function in the future or increase their current staff. Current staffing level is such that the largest percentage of available man hours is spent on administration of contracts with little man hours available for inspection. District Six would prefer to outsource 15%, and do not think inspection should ever be outsourced more than 50%. They have received acceptable results, with higher costs.

4.6.h Maintenance - Road and Pavement Repair

District Six is currently outsourcing 50% of their patching road and pavement repairs. This primarily consists of in-place asphalt patching projects and contract resurfacing projects. Some slurry sealing or thin overlays may be performed on low volume (ADT) roads in the future. The district would prefer to outsource 75%, which is also their recommended maximum.

100% of striping is contracted out, which is their desirable and maximum percentage. District Six responded that the cost of outsourcing striping was 30-50% higher than doing the work in-house.

Guardrail repair is also outsourced 100%, which is their desired and maximum percentage. They have received good results and are unsure of the cost comparison because it has been done by contract for many years.

4.6.i Maintenance - Bridge Repair

Maintenance bridge repair is outsourced by 50% in District Six. Primary bridge repairs performed by contract include concrete deck overlays, joint replacements, some substructure repair, painting projects, and some structural steel repair. The district would prefer to outsource 75% of this function, but recommend outsourcing no more than 90%.

4.6.j Maintenance – Other

Other tasks outsourced by District Six include right-of-way mowing in 7 of the 11 counties, interstate right-of-way mowing, guardrail repair, street sweeping, interstate barrier walls, tree and brush removal, drain flushing, graffiti removal, slab jacking, etc. They are outsourcing 75% of mowing, and believe the desirable and maximum percentage is 100%. They have received fair to good results.

Debris removal is outsourced 25%, but the district would prefer to outsource 50%, which is also the maximum.

Ditching and draining should also be outsourced. They are currently outsourcing 10%. District Six would like to outsource 30% of this function, which is also the maximum they believe it should be outsourced. With the current staffing levels within the department, the district foresees future maintenance outsourcing being necessary and likely increasing.

4.6.k Snow and Ice Removal

District Six outsources 20% of their snow and ice removal work. They would prefer to outsource 50%, but responded that the maximum this function could be outsourced is 30%. The survey respondents stated that contractors are not available during the summer months for other routine maintenance as are their own crews who work on snow and ice removal in the winter and general maintenance in the summer.

4.6.l Traffic Control Maintenance/Upgrade

Currently, District Six crews perform all of the traffic control functions for maintenance operations within their district. The district contracts 50% of their signal maintenance work. 50% is also the desirable percentage to outsource, while 100% is the maximum. They have received very good results from contracted work and feel the cost is the same as doing the work in-house.

4.6.m Equipment Purchasing/Maintenance

The district outsources all purchasing of cars and pickups to the Division of Fleet Management in the Central Office. Heavy equipment purchasing is outsourced to the Division of Equipment, also in the Central Office. District Six believes in handling all equipment purchasing internally, referring to the Central Office. Maintenance for sedans and pickups is outsourced 75%, while 100% is both the preferred and maximum percentage. The district believes the cost is the same and they have received good results. Heavy equipment maintenance is outsourced at a lower percent of 10%. 20% is their desired and maximum percent to outsource. The district does not have any cost comparisons because they only outsource specialized equipment.

4.6.n Rest Areas

Rest areas are wholly (100%) outsourced in District Six. The functions currently outsourced include all aspects of rest area maintenance (lawn care, custodial maintenance, etc.), with the exception of inspection. However, snow and ice removal in parking lots and major building maintenance is handled in-house. The district stated that the current trend for outsourcing this function will continue despite that the cost is slightly more to outsource.

4.6.o Other Functions

No comments were made for other functions outsourced.

4.7 District Seven

District Seven responded to both outsourcing surveys. They were undecided on outsourcing 6 out of the 26 functions (23%) and made no comment on 8 of the functions (31%). Because 8 functions were not commented on in the second survey, these functions are not as detailed as others. The district was in favor of outsourcing 9 of the 26 functions (35%) and was opposed to outsourcing only 3 (11%) activities.

4.7.a Planning

District Seven is currently outsourcing 10% of their planning work and desire to outsource 25%. Overall, the district does not want to outsource the planning function, except under circumstances that require the use of specialty equipment. District Seven stated that most traffic counts (83%) are done by the district with assistance from the Central Office. Occasionally parts of planning studies are outsourced to state wide contractors or advertised for contract. Public involvement is often outsourced to private firms. With regard to quality, outsourcing planning has historically been a positive experience, particularly with respect to public meetings. Technical demonstrations, such as Corsym Analysis, have been outsourced but the district feels that their involvement in this analysis is necessary. The district does recognize the need for technical traffic counters provided by private firms in areas of large traffic volumes where safety is a concern. District Seven also stated that the development of the Unscheduled Needs list and work with the Area Development Districts (ADDs) and Metropolitan Planning Organizations (MPOs) should not be outsourced. They feel that it is important to maintain a “big picture approach” to the current and long range planning process. With regard to cost, the district stated that it is more cost effective to have traffic technicians collect the bulk of the traffic counts, except in the instances where there are high traffic volumes and safety is an issue.

4.7.b Design

The design function is currently being 75% outsourced. The survey respondents did not complete the second survey which breaks the function into design Phase I and Phase II. The district stated that future outsourcing will be needed to meet project delivery demands. They also stated that some percentage of the work should be retained in-house to keep necessary skills in order to administer and oversee outsourced work.

4.7.c Right of Way

Right-of-way is currently being 50% outsourced by District Seven. Again, the respondents did not reply to the second survey which deduced the right-of-way function into the categories of appraisals, appraisal review, relocation and property management. District Seven stated that they have much better relations with the public when this function is performed by department staff. Having a good history with property owners allows the staff to communicate future project needs to owners more easily. The district feels that outsourcing the right-of-way function should be utilized only to meet peak demands.

4.7.d Non-Construction Surveying

In the first survey, District Seven stated that they currently outsource 90% of non-construction surveying. Even on in-house design work, the initial survey information is generally gathered utilizing flight information from consultants. The district feels that this practice should remain in the future, but some capability should be retained for small projects (i.e. bridge replacements) and special projects.

4.7.e Geotechnical Exploration

Geotechnical exploration is being outsourced only 10% of the time in District Seven. This percentage would be higher if District Seven did not have a geotechnical core drilling crew. The district stated that this function could be handled either in-house or outsourced, but there is value in having a crew in a district for flexibility to perform work. Having a core drilling crew would even be beneficial in other districts, particularly during busy times.

4.7.f Construction Materials Testing – QA/QC

District Seven is currently outsourcing 30% of their construction materials testing and 10% of their construction QA/QC. The district feels that neither of these functions should be outsourced. The district cited pilot projects that were established for concrete and grading where QA/QC was contracted out. The concrete QA/QC worked well but there were issues to be dealt with for the grading. With regard to quality, District Seven feels that both materials testing and QA/QC require constant monitoring and that the tests could just as easily be performed by their own staff.

4.7.g Construction Engineering Inspection

District Seven is not currently outsourcing construction engineering inspection and feels that this function should not be outsourced in the future. The district cited a case where construction engineering and inspection was performed by a consultant on grading work. No comments were made regarding the cost, but the district highlighted the following three problems with quality:

1. Consultant inspection was underestimated;
2. Unclear guidance as to responsibilities; and
3. Inconsistency of contractor personnel.

4.7.h Maintenance - Road and Pavement Repair

Road maintenance and pavement repair was broken down into patching, striping and guardrail repair. The district commented that for the general maintenance function, plans are being made to contract with local governments to maintain state roads and increase the amount of activities that are currently being contracted out.

Patching is currently being outsourced for 25% of the district's work. They desire to outsource only 5% of patching but feel if necessary, the function could be outsourced by as much as 75%. District Seven utilizes strip patching contracts to pave larger areas and have had good experiences with such contracts. With regard to quality, the district recognizes the need to have quicker response times. The district continues to perform pot-hole patching and small pavement area repairs. With regard to cost, strip patching

performed under a contract is cheaper than utilizing state forces. However, traditional stripping costs are high for contracted patching.

Striping is currently being 99% outsourced which is also the district's desirable and maximum level of outsourcing. District Seven has found the quality to be suitable and the cost to actually be cheaper than using the district's forces.

Guardrail repair is currently being outsourced by 95% in District Seven which is also the district's desirable and maximum amount for outsourcing guardrail repair. Historically, the quality of outsourced guardrail repair has been good and the price has been competitive among the contractors.

4.7.i Maintenance - Bridge Repair

District Seven feels that bridge repair should also be outsourced and is currently doing so for 70% of its maintenance work. All major bridge repairs, deck replacement/overlays, painting, and substructure repairs are contracted out by the district on a competitive bid basis. Only small routine activities are performed in-house. The district would like to see the percent outsourced increased to 75%, which is also the suggested maximum for outsourcing.

4.7.j Maintenance – Other

District Seven identified other tasks that are outsourced in their district to be mowing, sweeping, setting of railroad steel for slide repair, some ditching and pipe replacements. The second survey specifically asked the district to comment on mowing, debris removal and ditching and drainage.

Currently, they are outsourcing 95% of their mowing which is also the desired and maximum percentage they would like to outsource this activity. The district stated that the quality of mowing is not as good as that performed by District Seven crews; however, the contracted work is cheaper.

District Seven is undecided about outsourcing the debris removal function but is currently outsourcing 30%. Outsourcing of debris removal is done through a tree contractor during ice storms and tornados. No comments on cost effectiveness were made.

The district feels that ditching and drainage should be outsourced and are currently outsourcing 25% of this work. The desired and maximum amount they would like to outsource this function is 75%. The quality they have historically received has been good and the cost is comparable to that of the district's workforce.

4.7.k Snow and Ice Removal

District Seven is currently outsourcing 50% of their snow and ice removal. The district feels that this should be outsourced but at a desired and maximum rate of 50%. However, they recognize that response time is a major problem with the quality of the work. Also, the amount of salt used notably increased when contract trucks were employed for this function. Outsourcing this function is considered expensive, although no actual cost data was provided by the district.

4.7.l Traffic Control Maintenance/Upgrade

District Seven is undecided about outsourcing traffic control maintenance and upgrade in the future. The district did not provide any further comments in the second survey.

4.7.m Equipment Purchasing/Maintenance

District Seven said that Fleet Management in the Central Office handles most of the purchasing of sedans and pick-up trucks. The purchasing of dump trucks and heavy equipment are presently done in-house. The maintenance of sedans and trucks is handled by Fleet Management. District Seven is currently outsourcing 15% of their heavy equipment maintenance and would like to see this increase to 20%, also the suggested maximum. Minor repairs and maintenance are handled by the district but major/complicated repairs are outsourced.

4.7.n Rest Areas

District Seven is currently outsourcing 6 of its 8 rest areas. The two remaining state approved rest areas (both in Madison County) are scheduled to be closed in the Fall of 2005. The district is currently outsourcing 75% of the rest area function. The quality was reported to be fair and the cost is cheaper than performing the work in-house.

4.7.o Other Functions

Additionally, District Seven would like to see the training of Cabinet personnel outsourced. Computer based training would also be of great benefit to the district.

4.8 District Eight

District Eight completed both surveys and provided helpful comments as to their outsourcing practices. The district seems to be in support of outsourcing as the survey respondents thought that a portion of 16 of the 26 functions (62%) should be outsourced while 6 should not (23%). They were undecided about outsourcing four activities (15%). For some functions, District Eight provided cost comparison data for work performed in-house versus work contracted out. For several functions, the district cited maintaining the agency's core competency as the main reason for not fully outsourcing a given function. Also, from a quality control standpoint, they realize that their staff must have enough skill and ability for every function to manage consultant projects.

4.8.a Planning

District Eight is currently outsourcing 40% of their planning work but does not feel that this activity should be outsourced. The desirable amount of outsourcing was stated as 25%. Their response to the maximum percentage that this function should be outsourced was "as needed." The district is responsible for 100% of data collection and analysis, system updates and maintenance, and evaluating/updating/revising unscheduled project lists. With regard to quality, the district stated that they have not had any problems with the quality of outsourced planning studies. They did express concerns with the quality of outsourcing traffic counts because this would sacrifice the local knowledge of traffic patterns, resulting in improper county locations which are needed to ensure accurate data. No comments were made regarding cost effectiveness.

4.8.b Design

Design was broken down into Phase I and Phase II Design, of which District Eight believes both should be outsourced. Currently Phase I is being outsourced at 70% which is the desired level for the district. The maximum this district would like to see this function outsourced is 75% because it is imperative that some of the work is done in-house in order to develop the skills employees need to effectively manage a consultant's work. If the employees do not know how to perform the work then they obviously can not check the work. This puts the department at a disadvantage especially when it comes to negotiating man-hours. For Phase II Design, the district is currently outsourcing 75% which is also the desired level. The maximum this district feels Phase II should be outsourced is 80%, also to maintain the district core competency in managing consultant projects. The district stated that if they outsource anymore than what they are currently, they will lose the ability to develop and keep the expertise to carry out quality control and manage projects. District Eight stated that consultants do a good job on Phase II Designs, but the district gets a better product on Phase I Design from its in-house staff.

With regard to quality of Phase I Design, the district stated that they get satisfactory performance when outsourcing Phase I Design, however, the district still must be active in the decision-making process. Because of this fact, the district feels that they get a better quality product if they do Phase I Design themselves. Additionally, the cost of Phase I Design in-house is much less than that of consulting firms. For Phase II Design, the district said that they get approximately the same quality of work on consultant projects as they do in-house projects. District Eight stated that Phase II is more expensive when performed by consultants than it is performed in-house, especially on small projects such as bridge projects.

4.8.c Right of Way

The right-of-way function was broken down into the categories of appraisals, appraisal review, relocation and property management. District Eight stated that they need to keep enough staff to perform their average workload and consult out the remainder. Also, the district must have knowledgeable staff for quality control. They feel that appraisals and appraisal reviews should be outsourced but relocation and property management should not.

The district is currently outsourcing 95% of their appraisal work but would like to decrease this to 75%. They feel that they are currently at the maximum level at which appraisals should be outsourced. With regard to quality, the district has found the quality of consultants' work to be the same as what they get in-house. In looking at cost, the district feels that appraisals can be performed in-house much cheaper than when outsourced. However, the district staff would have to be increased if they were to perform many appraisals.

Currently, the district is also outsourcing 95% of appraisal reviews; however, they would also like to reduce this number to 75%. With regard to quality, the district experiences the same quality whether they outsource appraisal review or perform the work in-house. The in-house appraisal reviews are performed by the Central Office because District Eight no longer has the staff to perform this work. However, appraisal reviews can be performed in the Central Office at a cheaper rate than the district can provide.

District Eight is currently outsourcing 60% of their relocation workload which is also their desired amount. The maximum they would outsource this function is 80%. The district stated the quality of consultant work varies by consultant and that in-house relocation work is impeccable. Also, the in-house cost is considerably cheaper. Again, no actual cost data were reported with this statement.

With property management, the district is currently outsourcing 30% of the work which is also the maximum they think this function should be outsourced. The district would ideally like to keep this function entirely in-house. The district feels that their in-house staff does a great job with property management. Because of their success, they have never consulted this function, except for asbestos inspection. With regard to cost, the district feels that they can perform the work at a cheaper rate, including asbestos inspection.

4.8.d Non-Construction Surveying

District Eight currently outsources 60% of their non-construction surveying work. Consultants do their own surveying on contracted design projects, while the district performs all other survey functions. The district stated that it is imperative to have in-house survey functions in the district which is why they have set their desirable outsourcing at 60%, and a maximum of 70%. The district stated that they get a similar quality product from both in-house and consultants, but they feel that the in-house survey work is performed less expensively than consultants. The district also stated that there are many survey items that come up on a daily basis at the district that must be performed quickly and therefore would not be practical to outsource. They feel that it is imperative that enough survey work be kept in-house to keep one survey crew busy.

4.8.e Geotechnical Exploration

The district is currently outsourcing 50% of their geotechnical exploration, which is also their desired percentage. They would not encourage outsourcing over the maximum of 70%. The district feels that the current level of outsourcing is appropriate and that the Central Office is much more cost effective than consultants on small projects. The quality of work is comparable to their capabilities. Again, they feel they must keep in-house capabilities in order to keep quality control capabilities and to keep consultants honest on their pricing.

4.8.f Construction Materials Testing – QA/QC

District Eight feels that construction materials testing and QA/QC should be minimally outsourced. Currently, they are outsourcing 5% of the materials testing which is also their desired amount. The district feels that 20% is the maximum this function could be outsourced. From a quality perspective, the district stated that contractors sample and test all asphalt mixes and no problems have been found. The cost for this testing is part of the contract bid item for asphalt mixes; therefore the district does not know the amount the contractor adds for testing. The district is not currently outsourcing construction QA/QC but would like to see this function outsourced at 10%. With regard to the maximum percentage this function should be outsourced, the Central Office has stated that all construction projects (100%) in 2006 will be contracted under QA/QC inspection. District Eight currently has one project with Quality Control on Class A concrete. They had not received paperwork from the contractor at the time of this survey. The cost of this contract was \$57,508 to check concrete slump and air content and to make cylinders for a two mile section for a concrete barrier wall on an interstate widening project. The district feels that this amount was too high for the inspection.

4.8.g Construction Engineering Inspection

Construction engineering inspection is not currently being outsourced in District Eight. The survey respondents said this function should not be outsourced and did not provide any further comments.

4.8.h Maintenance - Road and Pavement Repair

The road maintenance and pavement repair function was broken down into the categories of patching, striping and guardrail repair. The district feels that patching and guardrail maintenance should be outsourced but are undecided about striping.

The district is currently outsourcing 60% of their patching which is also their desired and maximum amount to be outsourced. The outsourced work has been acceptable and the cost per ton has approximately been the same as the in-house costs. However, the district feels that contractors do not want to do small jobs and that state crews can respond much quicker.

District Eight is currently outsourcing 100% of their striping work. They are undecided about a desired percent but do feel this function can be outsourced to 100%. The district stated that its striping crews retro-reflectivity tests were above minimum readings required and that the district's cost to stripe is approximately \$58 per mile cheaper than the contractor's cost.

The district is currently outsourcing 70% of their guardrail repair. This is the amount they desire to outsource and is also the maximum amount they feel should be

outsourced. With respect to quality, the outsourced work is acceptable. District Eight stated that their crews can respond to an emergency situation much quicker.

4.8.i Maintenance -Bridge Repair

The district is currently outsourcing 20% of their bridge repair maintenance. This is also the desired and maximum amount of outsourcing they would like to have for this function. The district outsources bridge deck overlays and major repairs that can not be performed by their crews. From a quality perspective, the outsourced work has been acceptable. The district stated that they can not compare costs because the jobs they outsource are major repairs that their crews do not perform.

4.8.j Maintenance – Other

District Eight also stated that they outsource guardrail repair, mowing, tree and brush removal, snow and ice removal, and drilling. The second survey specifically asked about mowing, debris removal and ditching and draining. The district feels that mowing should be outsourced while ditching and drainage should not. The district remains undecided about outsourcing debris removal. They are currently outsourcing 50% of their mowing work which is also the desirable amount. Survey respondents did state that this function has the potential of being 100% outsourced. The quality of work outsourced has been acceptable and costs \$34-\$39 per acre for contract mowing. State forces are currently mowing rural routes that have less acres/mile, costing \$44 per mile. The district is not currently outsourcing debris removal, or ditching and drainage, and provided no further comment on the functions.

4.8.k Snow and Ice Removal

District Eight is currently outsourcing 2% of their snow and ice removal and would like to reduce that number so the function is handled in-house. With regard to quality, the district stated that most of the contracted operators are inexperienced in snow and ice removal. Also, it takes the contracted trucks longer to respond to snow and ice events because they are often coming from other counties. The district has four contract trucks in their district which costs \$81,200 each year just to have them available plus \$240 for each hour the trucks are in use. For this function, the district feels that it would save the state money by performing the work in-house.

4.8.l Traffic Control Maintenance/Upgrade

The district is not currently outsourcing traffic control maintenance and upgrade. They stated that the district's crew currently does excellent work and their signal installation appears to be less problematic than contractor installations. With regard to cost, signal contractors have charged \$35,000 to \$40,000 for installation when District Eight's signal crew could install the same signal for \$20,000 to \$25,000.

4.8.m Equipment Purchasing/Maintenance

The purchasing of sedans and pick-ups is outsourced to the Central Office, Division of Fleet Management, while the purchasing of heavy equipment is outsourced to the Central Office, Division of Equipment. The district is currently outsourcing 20% of their sedan and pick-up maintenance which is also their desired level to outsource. The

work has historically been acceptable and outsourcing at this level allows the district's equipment garages to focus their attention on the maintenance of other equipment. The district stated that outsourcing this type of maintenance is more expensive than performing the work in-house. No specific comments were made regarding the maintenance of heavy equipment.

4.8.n Rest Areas

No comments were made regarding the outsourcing of the rest area function.

4.8.o Other Functions

No comments were made for other functions outsourced.

4.9 District Nine

District Nine responded to both outsourcing surveys. They were in favor of outsourcing 11 of the 26 (42%) surveyed functions and were opposed to outsourcing 8 functions (31%). The district was undecided on outsourcing 3 functions, made no comments on 3 other functions and was split on outsourcing construction QC/QA. They are in favor of outsourcing quality control but not quality assurance.

4.9.a Planning

Planning is not currently being outsourced in District Nine as the district prefers to perform all of this work in-house. The district felt that the maximum this function could be outsourced is 25%. District Nine feels that their planning staff produces high quality outputs in all areas including traffic counts, planning studies, systems modification and public involvement. In regard to cost, the district feels that in-house planning studies are more cost effective, although outsourcing allows for the completion of a greater number of studies to be performed.

4.9.b Design

Phase I and Phase II Design are both currently being outsourced at 50%. The district stated that they would like to outsource 55% of Phase I Design, at a maximum of 60%. Phase II Design would ideally be 60% outsourced, at a maximum of 75%. The district stated that outsourcing is used to complete the workload that the district faces. If all projects were outsourced, the district feels that they would eventually lose the expertise needed to know the quality of service being provided through outsourcing.

With regard to quality of service for Phase II, District Nine stated that the quality varies by consultant and that “the quality never has and never will be as good as the in-house design quality.” They stated that the in-house expertise in all of the divisions cannot be achieved by outsourced staff. The district does realize that outsourcing is necessary to provide specialized expertise and to provide services in areas where the district is understaffed. The district feels that outsourcing Phase I Design is more expensive than performing the design work in-house. They feel that consultants are “motivated by time, which means money.” District Nine stated that in order to achieve top quality design work, the cost drastically rises. Additionally, KyTC staff are not pressured or motivated by time and money. The district feels that they also provide an unbiased resource which is essential for the cost effective spending of public monies.

District Nine feels that Phase II Design quality is usually pretty good from consultants. The district stated that they generally implement quality control and review which lessens mistakes on plans. However, getting consultants to make revisions to plans after the letting is difficult. With regard to cost, the district feels that Phase II outsourcing is also expensive and that consultants’ rates are constantly rising. Also, the right-of-way revision process requires much more time and is expensive compared to in-house design. The coordination between right-of-way negotiators and design consultants is often difficult and delays the revision process.

4.9.c Right of Way

The right-of-way function was broken down into the categories of appraisals, appraisal review, relocation and property management. District Nine feels that appraisals and relocation should be outsourced but appraisal review should not. The district is undecided about outsourcing property management. The district stated that with the anticipated retirements in the next several years, more right-of-way projects will be outsourced.

District Nine is currently outsourcing 25% of the appraisal function and would like to increase this to 35%. They feel the maximum this function could be outsourced is 50%. With regard to quality, they feel that the work of appraisal consultants is usually of good quality because it is normally reviewed by two staff reviewers. They feel that outsourcing appraisals would be necessary only if staff appraisers are unable to handle the workload. With regard to cost, District Nine feels that staff appraisers can complete projects in a more cost effective manner than consultants. Also, the district believes that staff products are a better quality product because the staff is not trying to complete the project as quickly as consultants and can therefore put more time and thought into the process.

The district is not currently outsourcing appraisal reviews and does not desire to outsource this function in the future. They feel that appraisal review should be a staff function as this is a method for quality control for consultant appraisers. The district did not provide information regarding the cost of outsourcing this service.

The district is currently outsourcing 10% of their relocation work. They would like to outsource 25% of this work which is also their established maximum. The district feels that the quality of outsourced relocation work suffers because the consultants' goal is to make money. The time involved in doing an excellent job in relocation cuts into a consultant's profit margin; at best, the district feels that they get a good result rather than an excellent one. District Nine feels that this function should only be outsourced when district staff is unable to handle the workload. With regard to cost, the district feels that consultant fees in this area may be more economical than the in-house cost of relocation. The district personnel invest more time and effort into accomplishing relocation and therefore invest more money.

District Nine is not currently outsourcing property management and did not provide any further data regarding the desired and maximum percentages of outsourcing this function. They did state that this function is handled by the District Office who has decided to include it as part of the right-of-way contract. Right-of-way consultants have qualified personnel and so the district sees no need to not outsource this function on consultant right-of-way contracts. No comments on costs were made by the district for this function.

4.9.d Non-Construction Surveying

District Nine does support the outsourcing of non-construction surveying and is currently doing so at 50%. This is their desired amount for outsourcing this function but they do feel that it is possible to outsource this function at a maximum of 65%. This figure could increase if funding becomes available for more projects. This district has a two-man surveying crew which is highly effective in completing the necessary projects. They do feel that outsourcing is necessary for larger projects that cannot be field surveyed but have to be flown. District Nine has found the quality for outsourcing non-

construction surveying to be disappointing. They cited that surveyors are usually subcontractors for the design consultant which makes coordination difficult. Consultant surveyors often do not coordinate with property owners although they are paid to do so. Also, aerial digital terrain models have not been accurate in the past. With regard to cost, the district stated that although aerial mapping is expensive, it is often necessary. It allows the district to get photography which is helpful for condemnation cases.

4.9.e Geotechnical Exploration

No comment was provided by District Nine regarding the outsourcing of geotechnical exploration.

4.9.f Construction Materials Testing – QA/QC

District Nine feels that quality control for materials testing should be outsourced at 100% and quality assurance for materials testing should be wholly performed in-house. With regard to quality, the district feels that their materials laboratory staff is highly experienced and specialized. The district provides quality assurance for the majority of projects and pay items. The district has found that many other construction items still need in-house personnel to ensure correct materials, material design, expertise, etc. With regard to the cost of construction materials testing, the district spends less than \$250,000 annually for salaries of six staff members, consisting of engineers and technicians.

District Nine is currently outsourcing 60% of their construction QA/QC and would like to increase this to 90%. The district feels that 90% is also the maximum at which this function could be outsourced. With regard to quality, the district stated that many of their contractors have experienced personnel or they at least have the ability to contract consulting firms in the area to provide quality control. The total cost is unknown because many bid items have QC set up for each item.

4.9.g Construction Engineering Inspection

District Nine feels that construction engineering inspection should not be outsourced. They have had some trial projects that did not produce good results. The district saw shoddy work and the total cost ran much higher than the state crew's average. The maximum they feel this function could be outsourced is 10%. With regard to quality, the four resident engineering crews in the district are experienced and qualified personnel. They do feel that outsourcing through the resident engineer would be helpful on an as-needed basis to cover times when the district does not have enough manpower to inspect every project. With regard to cost, the district spends approximately \$2,324,400 annually for the salaries of 36 people, including engineers and technicians.

4.9.h Maintenance - Road and Pavement Repair

The road maintenance and pavement repair function was broken down into three survey categories including patching, striping and guardrail repair. The district feels that patching (including striping) and guardrail repair should be outsourced but did not comment separately on striping. The district is currently outsourcing patching at their desired level of 90% which is also the maximum they would like to outsource this function. They feel the quality of the product varies from contractor to contractor, but is generally good. Striping, which is an item in the patching contract, is extremely high in price, and is not an economic advantage to the district at this time. Because the Cabinet

has to purchase asphalt material from the same companies that contract the patching, there are no savings to do the work with state forces.

District Nine is currently outsourcing 20% of their guardrail repair which is also their established desired and maximum amount. The district stated that outsourcing guardrail work is expensive but is currently being done on higher-volume routes within the district. State force crews do 80-90% of guardrail repair and can continue this as long as personnel are effective. The district feels that pavement repair should never be outsourced as a "routine function." If it were outsourced completely, it would greatly impact the outsourcing budget.

4.9.i Maintenance - Bridge Repair

District Nine is currently outsourcing 10% of their bridge maintenance and repair which is also the desirable and maximum amount to outsource. The district stated that large bridge repairs are outsourced while routine repairs and moderate size structural repairs are done in-house. They have found that the response time is too slow for outsourcing. The district stated that costs for large repairs, overlays, expansion dams, paintings, and large structural repairs are covered by special funding. These projects are outsourced through the Central Office. The district does not have any experience outsourcing routine functions.

4.9.j Maintenance – Other

Other functions surveyed under the maintenance category were mowing, debris removal and ditching and draining.

The district is currently outsourcing 15% of their mowing work, which is their desired percentage. They feel that if necessary, this function could be wholly (100%) outsourced. Currently, major routes (I-64, US 23, KY 9, KY 10, US 68) are contracted and the quality is generally good. The district has attempted outsourcing an entire county in the past, but the quality on smaller roads was very poor. The district stated that the cost is high, but is necessary for mowing major routes. At the time, the cost/quality ratio was too high for county-wide mowing. If state forces are reduced, mowing would be one of the first functions to consider outsourcing district wide.

The district stated that they were unsure of what was meant in the survey by "debris removal." They did state that in an event such as the 2003 ice storm, the district is forced to outsource that type of debris removal. Minor (small quantities) or debris removal can be left to state forces. The district feels that the cost is generally too high to pay with the routine maintenance budget. Also, catastrophic debris removal (such as the ice storm) is usually reimbursed by FEMA.

District Nine is not currently outsourcing ditching and draining work but feels the maximum this function could be outsourced is 5%. The district has outsourced ditching on I-64 once in the past 15 years. The quality was fine, but this work can generally be done by state forces. Ditching and draining are difficult to contract as a routine function, especially on smaller roads. The district did not have enough experience to comment on the cost of outsourcing this function.

4.9.k Snow and Ice Removal

District Nine is currently outsourcing 5% of their snow and ice removal. They would like to increase this number to 10% but feel this function could be 100%

outsourced. They currently have five snow and ice contract trucks available out of a total of 79. The district stated that contract trucks, although workable, are not as effective as well-trained state employees in removing snow. The district has found that contractors are difficult to monitor and are wasteful with the district's salt supply. The district feels that contractors do not take the same amount of pride in their product as state employees.

4.9.l Traffic Control Maintenance/Upgrade

District Nine only responded in the first survey to this function stating that they currently outsource 2% of traffic control maintenance and upgrade. The district stated that they need to be able to outsource small pole and overhead lighting pole installation. No further comments were made regarding this function.

4.9.m Equipment Purchasing/Maintenance

District Nine stated that the purchasing of sedans, pick-up trucks and heavy equipment is outsourced to the Central Office. The district said that for all cases, they can request and recommend what is needed but the decision is ultimately up to the Central Office. The district is currently outsourcing 5% of car, truck and heavy equipment maintenance which is their desired amount. They only outsource major projects and repairs that require more equipment and specific expertise than their people have. When they do outsource, the time loss involved is severe. The district did not provide any comments on the cost of outsourcing vehicle or heavy equipment maintenance.

4.9.n Rest Areas

All (100%) of the janitorial and landscaping functions with regard to rest areas are currently outsourced by District Nine. Outsourcing this function is working well in the district from a quality perspective. Also, the district stated that the cost is probably reasonable and they will continue to wholly outsource this function in the future.

4.9.o Other Functions

No comments were made regarding any other outsourced functions.

4.10 District Ten

District Ten completed both surveys and included many comments on their current outsourcing practices and experiences. The district is currently outsourcing a percentage of 17 of the 26 total functions. They believe that the majority of functions should not be outsourced, but do not have the option to be so selective due to heavy workload, time constraints, and smaller staff.

4.10.a Planning

District Ten handles planning well because they know the area's needs and can respond quickly to critical situations with little advance notice. They do not think planning should be outsourced, but are outsourcing 25% of this function due to need. District Ten does not believe planning should be outsourced more than 60%, despite need. Outsourcing this function will be more successful if the consultants are familiar with the area and needs of the people.

4.10.b Design

60% of Phase I and II Design is outsourced, but that is not the district's ideal amount. They would prefer to outsource 50% of Phase I and 75% of Phase II. Neither phase should be outsourced more than 80%, to ensure they do not lose their high level of expertise. In-house design is beneficial because the district is more familiar with all aspects of the project and has a vested interest in doing it well. Phase I often requires changes and alternatives, which raises the cost of using consultants.

Phase II is more conducive to outsourcing. Contracts and scope of work have been better defined, assisting contractors in producing high quality work. The district's decreasing staff has increased the need to outsource for District Ten. They currently outsource most large and complex projects to balance their workload and smaller staff.

4.10.c Right of Way

The district is outsourcing 50% of right of way appraisals and 30% of appraisal review. They do not think these functions should be outsourced more than 90%. The district needs more in-house appraisers, but they are not currently training any, and need to better develop the training program. There has not been any appraisal training in the last five years. Appraisal consultants are expensive and depending on them only decreases the level of experience in the district. However, they are necessary and will become increasingly more so, if in-house training is not improved. Another respondent from the district said no one in the district is qualified, due to lack of training and experience, to do appraisal review. They would like to keep review in-house, but are not in a position to do so.

Right of way relocation is not outsourced, nor does the district recommend it. If necessary, the maximum it could be outsourced is 50%. The in-house staff handles this function well, and keeps the process moving smoothly. When relocation is outsourced, they lose the quality control necessary to ensure quality results. Consultants are more expensive, require oversight, and can rush the relocation process.

Property Management only involves demolition, making it more beneficial to outsource. The district currently outsources 15% of this function. They believe it is desirable to outsource as much as 70%, but never more than 90%. The work that remains in-house can be handled by one person.

4.10.d Non-Construction Surveying

40% of non-construction surveying is outsourced, while 50% is District Ten's desired percentage to outsource. They believe it is important to maintain their in-house surveying crew for smaller projects and setting ROW on larger projects. The crew is able to perform many different tasks as they arise. They would, however, benefit from having a licensed surveyor. On a whole, in-house services are less expensive and district personnel have a beneficial familiarity with projects and their locations.

4.10.e Geotechnical Exploration

Geotechnical exploration is handled by the Central Office. The district no longer has the equipment for geotechnical investigations.

4.10.f Construction Materials Testing - QA/QC

District Ten does not outsource any of their construction materials testing or QA/QC and do not believe that these functions should be outsourced. Material testing should be handled by district personnel, but the process can be improved and made more time efficient. The district has the necessary experience for materials testing and QA/QC, which they are concerned with losing by outsourcing. If QA/QC is outsourced, the district said it should not be provided by someone affiliated with the prime contractor. They have had some pilot projects with concrete QA/QC and the quality of contractors was not an issue.

4.10.g Construction Engineering Inspection

The district does not outsource inspection. They have qualified inspectors and if necessary, they can handle multiple projects. Some jobs do not require a full time on-site inspector. Retirements have decreased the number of inspectors over the years, and in addition to an increase in workload, outsourcing may need to be considered. If not, the district will need to issue large amounts of overtime to handle their future workload.

4.10.h Maintenance-Road and Pavement Repair

90% of patching is outsourced and the district believes it could be completely outsourced in the future, if necessary. Contractors have proved to be more productive and produce quality work. The district lacks the resources to handle all patching in-house. They are able to do small patching and pothole repairs. Outsourcing 100% patching could be a problem if asphalt contractors aren't available to do the work.

Striping is outsourced 90%, but District Ten would prefer to lower it to 80%. There is benefit in keeping a machine in the district to do spot striping as necessary. Emergency work does exist, and without it the district would become dependent on contractors.

Guardrail repair is outsourced 95%, but 50% is ideal. The district has had to wait as long as months for contractors to perform work. They have an in-house guardrail crew that can handle damaged end treatments and downed rails. The crew completes the work faster than contractors and is quite proficient. Outsourcing is necessary on major routes, where traffic control is an issue. Contractors' delayed response is the biggest and most common problem that District Ten experiences with guardrail repair.

4.10.i Maintenance-Bridge Repair

85% of bridge repair is outsourced, which is also the ideal and maximum percentage to be outsourced. Outsourcing provides a high level of expertise that can be utilized when needed. The district handles smaller bridge projects and outsources major repairs, such as overlays and deck replacements. Contractors can perform the work faster which involves less disruption to traffic. Outsourcing, in conjunction to maintaining bridge crews is the optimal system for District Ten.

4.10.j Maintenance – Other

Mowing is outsourced completely and the district will maintain this number. The district has had good results in the past. This is the first year they have outsourced mowing completely. They have found the cost to outsource is roughly the same as doing it in-house.

Debris removal is handled 100% in-house. This function is not outsourced, nor do they recommend it to be in the future. District employees are nearby and can quickly remove items as they are called in. Contractors would not necessarily be as close and wouldn't be able to respond as quickly. Outsourcing an 'around the clock' function, such as debris removal, is not cost effective.

Ditching and draining are not currently outsourced. The district would like to outsource as much as 75% in the future. Outsourcing would be beneficial to the district because contractors can handle the work more quickly due to specialized equipment. The district does have several ditching crews that are able to respond quickly. Outsourcing their ideal percentage is recommended if it is let as a large, one-time, contract on a certain road.

4.10.k Snow and Ice Removal

Snow and ice removal is not outsourced. It is the top priority in District Ten, and therefore handled by district crews. They do have a few trucks on standby on the Mountain Parkway, but rarely use them. Outsourcing is not a feasible option because most snow and ice contractors primarily haul rock and materials, and are not available or experts on snow and ice removal. There are not enough willing contractors in the district to significantly outsource this function.

4.10.l Traffic Control Maintenance/Upgrade

50% of traffic control maintenance is outsourced. This is District Ten's desired percentage to outsource. In-house staff is able to respond quickly, in comparison with most contractors. The district typically outsources new installations and some loop installations. Outsourcing utilizes contractors' specialized equipment and expertise, but they do not come without an increase in cost.

4.10.m Equipment Purchasing/Maintenance

Equipment purchasing of sedans, trucks and heavy equipment is handled by the Central Office. Fleet Management purchases vehicles, but does not always buy what the district says they need. There is benefit in letting districts purchase their own cars and trucks. Heavy equipment purchasing by Central Office has worked well in the past. They have consistently purchased the equipment District Ten needs.

Equipment maintenance for sedans and pickups is outsourced 80%, which is also the desired percentage. Routine vehicle maintenance has always been an involved process and can be outsourced to increase efficiency. This would allow more time for the mechanics to handle other work, such as heavy equipment.

Heavy equipment maintenance is only outsourced 5%, which is what the district prefers, as well. They have experienced mechanics that are able to do common repairs. Extensive and complex maintenance are outsourced when necessary. Outsourcing this function completely would result in the loss of in-house capabilities to make repairs in an emergency.

4.10.n Rest Areas

Rest areas are not outsourced, nor does the district believe they should be. The district is able to maintain rest areas and have always received positive feedback from the public. When necessary, they are able to work overtime, lessening the need to outsource. Outsourcing may result in a loss of quality and customer satisfaction..

4.10.o Other Functions

No comments were made for other functions outsourced.

4.11 District Eleven

District Eleven only completed the first survey sent in the fall of 2003. The district responded to outsourcing 14 of the 16 functions (88%) surveyed. Because survey two was not submitted, the comments made by the district are not as informative and specific as other districts.

4.11.a Planning

District Eleven is currently outsourcing 75% of their planning work. They feel that the cabinet would be much more effective by keeping more planning in-house, particularly for Phase I, even if it involves hiring more staff.

4.11.b Design

The district is also outsourcing 75% of their design work. They stated that large, high profile projects need to be outsourced. The district feels that they would benefit economically by hiring enough staff to do 75% of the design in-house and outsource the other 25%.

4.11.c Right of Way

District Eleven is currently outsourcing 85% of the right-of-way work. They feel that unless they hire and train employees, they will only be able to buy right-of-way in-house on very small projects. They stated that they can perform better than acquisition consultants who look at acquisition from a profile perspective, whereas the cabinet provides the taxpayers a service. The district did state that the efficiency of their force could definitely improve.

4.11.d Non-Construction Surveying

The district only outsources non-construction surveying at 5%. They feel that there is not a need to outsource this function.

4.11.e Geotechnical Exploration

No comment was provided for the outsourcing of geotechnical exploration.

4.11.f Construction Materials Testing – QA/QC

District Eleven is currently outsourcing 30% of their construction materials testing and QA/QC. They stated that Cabinet contractors will likely increase their work percentage to 60% over the next 5 years.

4.11.g Construction Engineering Inspection

The district is not currently outsourcing construction engineering and inspection. They are however considering outsourcing this function for design/build contract work.

4.11.h Maintenance - Road and Pavement Repair

District Eleven is currently outsourcing 70% of their road maintenance and repair work. They stated that most of this work is now done under contractor strip and patching prices. The district stated that this is likely to increase to 80%.

4.11.i Maintenance - Bridge Repair

Bridge maintenance and repair is currently being outsourced at 90%. The district feels that this percentage should remain the same.

4.11.j Maintenance – Other

Other tasks that are outsourced by District Eleven include mowing, signal upgrade, guardrail repair, panel signs, overhead sign inspection and tree cutting. They are currently outsourcing 33% of these functions and feel that the outsourcing of mowing, guardrail repair and tree cutting will likely increase in the future.

4.11.k Snow and Ice Removal

District Eleven is currently outsourcing 15% of their snow and ice removal. They made no comments regarding their experiences outsourcing this function.

4.11.l Traffic Control Maintenance/Upgrade

Traffic control maintenance and upgrade is currently being outsourced by 20% in District Eleven. This will be increased to 45% in 2005.

4.11.m Equipment Purchasing/Maintenance

With regard to equipment purchasing and maintenance, District Eleven responded to currently outsourcing 40% of their sedans, 0% truck and 10% heavy equipment. The district said that they look for this to remain constant.

4.11.n Rest Areas

District Eleven is currently outsourcing 100% of their rest area work including the I-75 Welcome Center Operation. However, major maintenance is performed by the Transportation Cabinet.

4.11.o Other Functions

No comments were made regarding any other outsourced functions.

4.12 District Twelve

District Twelve did not return the second survey, but did resubmit the first survey with additional comments. The district is currently outsourcing 11 of the original 14 functions. One of the original functions, rest areas, is not applicable to the district, so there are only two functions that they are not outsourcing.

4.12.a Planning

District Twelve is outsourcing 50% of planning. They believe the Cabinet can provide work that is higher in quality and cheaper in price than contractors. They have had success in outsourcing half of their planning work because the district is always heavily involved, despite the size of the job that is outsourced. Consultants are more expensive when considering large projects, but are able to complete the work faster. This tradeoff can be advantageous, depending on the circumstance. When outsourcing functions, the district suggested utilizing a project manager at the Cabinet level.

4.12.b Design

They are currently outsourcing 90% of their design work. The district stressed the importance of keeping projects with a variety of complexity to maintain skills and keep an in-house expertise.

4.12.c Right of Way

40% of right of way is outsourced in District Twelve. They believe ROW should only be outsourced when it is necessary to maintain the project schedule. Otherwise, it is not advantageous due to the high cost. Contractors have been less effective at clearing projects and do not work as well with the property owners. They are not as concerned with customer satisfaction as in-house personnel. Unfortunately, the Cabinet is losing manpower and may not be able to maintain a high level of service without outsourcing.

4.12.d Non-Construction Surveying

The district is currently outsourcing 80% of their non-construction surveying, and does not see a need to increase this number in the future.

4.12.e Geotechnical Exploration

The Central Office handles most of this function. District Twelve handles 20% of their geotechnical exploration and believe it would be beneficial to move to total outsourcing with project managers and area engineers to oversee work.

4.12.f Construction Materials Testing- QA/QC

The district outsources 25% of materials testing and QA/QC. They do not recommend outsourcing QA/QC on concrete quantities and believe there should be more stringent guidelines for all areas of QA/QC. One problem the district has had with contractors is that they don't consistently supply information in a timely manner. The second response differed slightly in that they would like outsource all of this function using performance adjusted payments.

4.12.g Construction Engineering Inspection

Inspection is currently handled completely by district personnel and 0% is outsourced. The district would prefer for this to remain the same, however, they also have limited manpower. This lack of personnel and resources will force the district to outsource at least 50% of their work in the future.

4.12.h Maintenance - Road and Pavement Repair

The district believes they are currently outsourcing the maximum amount of road and pavement repair. They are outsourcing 90%, and believe the majority of their employees have lost the necessary skills for this function. The second response stated a desire to explore total maintenance for roads that involved performance adjusted pay.

4.12.i Maintenance - Bridge Repair

District Twelve would also like to include bridge repair in a performance-based total maintenance contract. They are currently outsourcing 40% of this function.

4.12.j Maintenance - Other

Mowing, striping, sweeping, tree cutting, embankment repair, excavation work and guardrail repair are included in this function. 45% of this work is currently outsourced. Many of these functions are outsourced because the specialized equipment necessary to perform this work is not cost effective to purchase and maintain.

4.12.k Snow and Ice Removal

The district is not outsourcing any of their snow and ice removal work. They would like to outsource some of this function, but it has not been possible in past years. They requested ten contract trucks for the previous winter and did not receive any bids. Contractors have had difficulty hiring employees for this work because there is a shortage of competent drivers who are willing to do snow and ice removal.

4.12.l Traffic Control Maintenance/Upgrade

District Twelve responded that 100% of this function could be outsourced without sacrificing the current level of quality. Only 85% of this function is actually outsourced, but the percentage may increase to 100% in future.

4.12.m Equipment Purchasing/Maintenance

Car and truck purchasing is handled by Fleet Management. Heavy equipment is not outsourced, and handled 100% by the district. Maintenance of these vehicles was not part of the first survey, so we do not have information on that portion of this function.

4.12.n Rest Areas

This function is not applicable to District Twelve because they do not have rest areas in their district.

4.12.o Other Functions

No comments were made for other functions outsourced.

5.0 PROPOSED OUTSOURCING FOR KYTC CENTRAL OFFICE

The Central Office serves as a support system for the twelve district offices. They oversee the districts, their operations, and allocate their funding. The Central Office is comprised of many different departments and personnel, making it unfeasible to say that the entire office takes the same stance on outsourcing. Many meetings were held to meet with the individual branches of the Central Office. Some views were shared universally, such as agreement that outsourcing, whether good or bad, will need to be considered if staff size does not increase. Some areas, such as maintenance, have been experiencing an inadequate staff size for years. Several departments have been increasing the amount of outsourced work to meet the demands of their existing workload.

As the population and number of drivers increase, roads are traveled more frequently. The money available to maintain and build new roads does not increase at the same rate. Therefore, each department in the Central Office, as well as each district, must determine what needs are greater and crucial to maintain customer satisfaction and safety. Money is a limiting factor in deciding what can be carried out by state personnel. Rarely is outsourcing cheaper, but cost is not the reason to outsource. Outsourcing is creating a balance of utilizing state forces and supplementing with vendors' time or expertise when necessary. There is great concern with depending on contractors and consultants too heavily, and losing the ability to do work in-house. Paying too much for outsourced services, without getting enough quality work in return is also a concern. An overview of certain departments and their current and expected outsourcing practices are outlined in the following sections of the report.

The information presented does not reflect the views of the entire Central Office staff, but only those of the people who were interviewed. However, the persons interviewed have extensive experience and expertise in their assigned field. Their ideas are worthy of consideration by the Cabinet when reviewing outsourcing needs in the future.

5.1 Planning Opinions

The Division of Planning is made up of 70 people in the Central Office, and a small staff in each district. The districts act as an extension of the Central Office, which allows them to do a substantial amount of work with a small local staff. Nineteen of the seventy people in the Central Office are engineers and professionals. The total group has an average age of 42, resulting in a good range of ages and experience. An estimated 15-20 people will be retiring in 2008, which is about 25% of the current staff. Unfortunately, most of upper management will be eligible for retirement. Specifically, five Branch Managers and one Assistant Director will be retiring in 2008. The current director will be retiring in the Summer of 2005.

The role of the Central Office is to determine what work needs to be done and how much money each district needs to do the work. They then distribute the work to the districts, who may or may not be able to handle it with their current workload. The District Managers in each district are in a position to decline Central Office work requests in such situations. However, the districts' work is funded by Federal money and distributed by the Division of Planning; therefore, the districts need to perform certain portions of the work.

Just as the districts outsource a portion of planning, so does the Central Office. They primarily outsource data collection, planning studies, coal haul reporting, federal reports, and traffic counts. Although traffic counts require a lot of time to complete, the Division of Planning would prefer not to outsource them because they can do the work efficiently in-house and feel that outsourcing creates more, not less, work for their office. Traffic counts are \$30/count cheaper when done in-house and the quality can suffer when outsourced. The Central Office has 15 years of traffic experience per person. Such experience is important to utilize and maintain when the state relies so heavily on the reports.

Outsourcing can be beneficial to the Central Office, but it is important not to underestimate the benefits of local district technicians. The districts' staff knows the community, elected officials, and local residents. They are an integral part of the success of the Division of Planning. Outsourcing too much of the districts' planning division will result in a loss of this benefit. The benefits of technicians in the Central Office should not be overlooked, as well. They are the majority of the workforce and a huge support system for the planning engineers.

The Division of Planning will continue to outsource large planning studies as needed and wanted to maintain control over what their division outsources and what they do in-house. It was stressed that cheaper is not always better, and a function should not be outsourced simply because it is easy. Deciding what to outsource should be left up to the individuals or group who know the most about that function.

5.2 Bridge Design Opinions

All bridge design is handled at the Central Office level. Districts do not perform bridge design in-house. The Bridge Design Division is outsourcing about 50% of their bridge work. This costs them about \$100/hour, but the cost of doing the design in-house is not clearly known. The Central Office chooses which bridges they will design, and which will be outsourced to consultants. This decision is based on location, type of structure, layout, and timeframe of job. Only on rare occasions do they outsource because of lack of expertise. Tunnels and cable-stayed bridges fall into this category. Bridge Rehabilitations are done by the Bridge Design Department and the Maintenance Department. Last year, half of the work was bridge replacements and the other half was new projects. The Central Office may be designing as many as 16 to 20 bridges at one time, typically of standard design.

The Bridge Design Department has 14 full time designers. Only one of the 14, the Branch Manager, is near retirement.

There is recent concern in the bridge division that the Central Office is outsourcing more bridge design work than is beneficial. In the last two months, there has been an attempt to outsource many bridge structures with roadway contracts, thus reducing the amount of work for the bridge department in later years. This practice is of concern to the bridge design staff.

The Division recommends that at least 70% of engineering services remain in-house. Work should only be outsourced during peak times, or when a certain expertise is needed. The Division staff feels that engineering services are more efficient when done in-house.

5.3 Equipment Maintenance Opinions

A shortage of skilled workers is becoming an increasing problem in the districts and the Central Office, as well. Metropolitan areas, such as Lexington, Louisville, and Northern Kentucky, pose the biggest problem. There are a lot of opportunities for skilled mechanics in these areas, which makes pay a deciding factor when taking a job. The state's low pay grade does not attract many workers, or actively hold the employees they currently have. Qualified technicians or mechanics can go to a construction or equipment company and make twice as much money.

Retirement has also hurt the Division of Equipment. Over the past few years, many experienced workers have retired, most of who have not been replaced. The 2008 retirement boom will greatly affect the division.

The Division of Equipment handles equipment larger than one ton, or heavy equipment. This includes excavators, backhoes, and graders. Everything below one ton is handled by Fleet Management, a different entity. The Division of Equipment supports maintenance state wide. They supply all of the necessary equipment to the districts. The equipment is allocated or maintained by the Operations Management System, OMS. OMS includes Pavement Management (PMS), Maintenance Management (MMS), and Equipment Management Systems (EMS). OMS is a program that allows districts to input the amount of use for each machine. The Division of Equipment can use the information to determine what equipment is necessary and needs to be repaired or replaced. Equipment and repairs are based on need, which is based on usage. OMS is used to distribute money and equipment to all the districts.

The Division can't outsource everything because they need to be able to respond to problems and disasters. They feel the government should be run like a business, but should still realize that they provide a service to the public. The need for outsourcing increases as the Division's staff continues to decrease.

It is desirable to have a student training program similar to co-op programs in engineering for students pursuing training as a mechanic. By supporting the student's educational costs, and requiring time in employment with the Cabinet's Equipment Division similar to the KyTC Engineering Scholarship Program, employment can be greatly enhanced. The Division would like help in investigating such a program.

5.4 Snow and Ice Removal Opinions

Statewide snow and ice removal is handled by the Roadside Environmental Branch. This area also includes vegetation maintenance and rest areas. Like equipment maintenance, snow and ice removal is also having staffing difficulties. They would like outsource more, but they have not been very successful in contracting drivers. Both contractors and individual drivers are hesitant to help because of liability concerns. A construction worker may qualify for unemployment in the winter and is not willing to become ineligible for what could turn out to be only a few days of winter work.

Currently, approximately 30% of this function is outsourced. The Central Office is able to contract out 220 trucks for interstates and parkways, and has an in-house fleet of 800 trucks. The Central Office generally creates contracts for each district for materials, including salt and liquid chloride. The funding is divided among the districts and each district makes their own purchases.

5.5 Rest Area Opinions

As mentioned, rest areas fall under the Roadside Environmental Branch. Many rest areas are maintained by contract and have had good performance. These contracts are established by the Division of Finance.

5.6 Mowing Opinions

The Central Office has been contracting highway mowing, both interstate and parkway, since 1973-74. This expanded to include rural roads in the 1980's. The Central Office is spending \$10 million per year on contracts. Mowing varies throughout the state, on a district level. Herbicide spraying on interstates is minimally outsourced.

5.7 Materials Testing/Geotechnical Exploration Opinions

The Division of Materials is responsible for testing all materials used in construction. The Division also handles geotechnical exploration for all of the districts. They outsource a portion of the drilling through their statewide drilling contracts and a portion of the engineering through their statewide engineering contracts. They have continually received good quality of work from these contracts.

Outsourcing may increase, but it is a factor of workload and staff size. The current staff size of the geotechnical portion of the Division of Materials is 30 people. This includes 8 engineers, 4 geologists, and 18 engineering technicians. Included in this number are three crews, composed of two men each. 40% of borings are outsourced. Additionally, testing and logging of cores can be carried out by contractors.

The materials testing branch has approximately 60 people who conduct inspection, sampling, and testing. Outsourcing includes training contractors to be samplers and inspectors, but the KyTC takes QA samples. A contractor is responsible for all areas of testing, including asphalt, aggregate, and concrete. In-house testing involves more challenging and higher quality tests. All private labs are not believed to be up to standards, and heavy outsourcing will result in a loss of expertise in the Division.

The Central Office is able to maintain consistency in testing and ensure materials are satisfactory. This increases conformity, more so than if the districts were to solely handle this function individually. Geotechnical Exploration involves specialized equipment, which costs a substantial amount of money for the districts to purchase and maintain. Individual district crews would also increase the cost of carrying out this function. The Central Office is able to maintain in-house expertise, without inflicting unnecessary costs on the districts.

5.8 Traffic Operation Opinions

The Division of Traffic Operations in the Central Office handles all ITS related equipment and communication systems for all the districts, whereas the districts primarily perform maintenance to traffic signals. The Central Office most often outsources the construction and installation of signal systems. Very rarely do they construct or install systems themselves.

The Division of Traffic Operations mainly outsources to The Division of Technology, who buys and installs all ITS equipment. They have a contract for repair services, as well. Smaller ITS projects are done in-house, including design and preparation of contracts for construction.

The System Operations branch of The Division of Traffic Operations has a staff of 14 who oversee 150 signal systems. The Division of Traffic Operations outsources based on need, due to heavy workloads. The districts report what they need based on their abilities. The districts are varied in what work they are able to carryout themselves depending on what expertise they have been able to maintain. As with The Division of Maintenance, it is harder to maintain necessary staff levels in some districts. District 5, for example, loses many employees to the City of Louisville, because they are able to pay nearly twice as much for traffic signal technicians. The Division of Traffic Operations relies on outsourcing to help with peaks in workload, and will continue to do so as the need remains.

5.9 Road and Pavement Repair/Maintenance Opinions

The Pavement Management Branch of the Division of Maintenance has an approximate \$67 million budget for State Primary, Secondary, and Supplemental highway system resurfacing. Each district was allocated a portion of this sum based on need and road conditions in their district. The districts determine what repairs need to be made and create an estimate. The Central Office evaluates the estimate to ensure it is reasonable and correct. The Operations Management Systems (OMS) is also used to determine the needs of each district.

Pavement Management System (PMS) is part of OMS. PMS assigns a Pavement Condition Index (PCI) to all sections of road maintained by the KyTC. This index is determined by the rideability of the pavement and how it compares to the critical rideability, which is based on the traffic volume of each road. The Pavement Management Branch uses PMS and the districts' road estimates to determine how much money they will receive for road maintenance. In 2004, the districts needed \$148 million to complete all repairs, which was over twice the amount of money that was available.

Districts have been increasing the amount of road and pavement maintenance they outsource, as well as the Central Office. As the number of people who travel on Kentucky roads rises, so does the wear and tear on the roads. Litter pickup and pavement needs also increase. Fewer and fewer people are available to do the work, regardless of the increase in need. Patching is an area that is significantly outsourced, as well as litter pickup and striping. Pavement reflector installation is totally outsourced. The demand for maintenance work is never finished, thus driving the need to outsource to better utilize the Cabinet's time. Focus should be placed on areas that need immediate response, such as pothole patching, litter pickup, and emergency response. The extent to which each area is outsourced is then determined on the available manpower and time constraints on the Pavement Management Branch of the Division of Maintenance.

6.0 SUMMARY AND RECOMMENDATIONS

As a means of accomplishing their heightened project demand under resource restriction, State Departments of Transportation have successfully outsourced many routine functions to private sector consultants and contractors. An NCHRP study by Warne (2003) reviewed the changes in outsourcing practices by looking at practices in the past five years and looking forward to the outsourcing practices expected in the next two years. Only 5% of outsourced activities saw a decline over the past five years while 54% saw an increase in outsourcing activity. The design function is noted as having the highest percentage increase in the last five years. The state DOTs surveyed primarily indicated an increase of a constant level of outsourcing projected for the future. Researchers attributed this outcome to a reflection of the increased workload from the passage of TEA-21. Because outsourcing has evolved from being restricted to labor intensive, non-technical tasks, to now including innovative engineering design, outsourcing is a highly applicable concept to the variations in function and responsibility of state DOTs. Cost savings, innovation, improved quality and efficiency, peak demand performance, speedy project delivery time and risk management are a few of the benefits demonstrated through outsourcing.

As seen in the summarized comments from the survey respondents, there is a considerable amount of variation associated with the outsourcing needs and practices of state DOTs. Some DOTs, Texas for example, have established statutes requiring certain percentages of a function to be outsourced. With some functions, this established law serves the agency well in accomplishing its needs and meeting its responsibilities to the traveling public in the most efficient manner. With others, the statutes have been revised due to escalated costs and poor results. No concrete guidelines or best management practices have been established for outsourcing the functions and responsibilities for DOTs because of the extreme variation among the agencies. Rather, the most logical recommendation is to review the practices of a DOT and assess whether the most practical applications of in-house and outside resources are being used.

Metrics must be evaluated for each individual function with regard to current outsourcing practices. Public officials must evaluate each function's maximum outsourcing capability with respect to maintaining a core competency within the agency. If the core competency of an agency can not be clearly identified and preserved, then the agency is not able to effectively meet the traveling public's needs. It is clear that outsourcing will continue to rise in the future given the trends of privatization, downsizing and the shift in focus of transportation agencies. It is the responsibility of every state DOT to subjectively look at their outsourcing practices and plans for the future.

Based on the national survey and literature review of outsourcing practices, the recommendation for the KyTC is to assess each of its function's potential for increased outsourcing with regard to the Cabinet's workload, staff availability, flexibility in schedule, in-house expertise and cost. With Kentucky being one of the states participating less in outsourcing, there is much potential for the Cabinet to identify areas for opportunity with regard to this practice. The results of the UK surveys clearly reveal that every function has the potential to be outsourced in a manner that is potentially as effective, in both quality of work and cost of work, as work performed in-house.

No function surveyed averaged below an effective quality rating of 3.4 (3.0 indicating no effective change). Few functions averaged below an effective cost rating of 3.0, 2.8 being the lowest average. Therefore, there are no functions that can be eliminated from potentially being outsourced based on having a negative quality effect. An argument could potentially be made against a slightly negative cost effect for four functions. However, there remains much speculation as to the validity of cost comparisons among work performed in-house and that of consultants. In reviewing functions seldom outsourced, such as program management, the states that did have experience in outsourcing this function, although limited, were pleased with the results they obtained.

The success of an outsourced function relies on the selection of a vendor that is reliable, trustworthy and whose objectives are aligned with those of the DOT. Management and oversight of such contracts from the perspective of the Cabinet is critical for project success. While it is important for the Cabinet to be able to perform all of the necessary functions expected of a transportation agency, it is also necessary for the Cabinet to provide leadership and management through the use of highly qualified consultants/contractors.

The experience of this investigation clarifies that the most useful source of information for outsourcing is found through surveys and interviews with personnel directly related to DOTs that have experience in outsourcing. In determining whether or not to outsource a given function, a decision must be based on a logical, systematic process considering: Costs, Expedition of Work, Peak Work Volumes, Unique Skills, Training, Human Resource Aspects, and Retention of Technical Personnel to Preserve Core Competencies.

Outsourcing is a necessity and a reality among state DOTs and is capable of successfully delivering transportation projects in an efficient and timely manner through public-private partnerships for the betterment of transportation infrastructures.

The data from the second survey of the KyTC District Offices is summarized in Table 4 and Table 5. Two of the districts did not submit a second survey summary; however, all responded to the first survey. The data shown reflects the level of outsourcing desired by the districts in the future if more outsourcing is necessary. What was interesting in the data submitted on “Outsourcing in the future” is that there is significant diversity amongst the districts, which is heavily related to the work environment and the near-future retirement impacts in their geographic areas. Although more in-depth evaluation by the Cabinet will be required in the future, the variation amongst the districts was believed to be appropriate by the researchers and should be considered in the future.

Table 4: Districts' Recommended Outsourcing Percentages, District 1 Through 6

Functions	D1 (%)	D2 (%)	D3 (%)	D4 (%)	D5 (%)	D6 (%)
Planning	0	15	30	10	50	10
Design Phase	40	10	75	50	70	50
Design Phase II	40	10	75	90	60	75
ROW- Appraisals	50	20	90	100	0	50
ROW- Appraisal Review	80	50	55	100	70	25
ROW- Relocation	10	0	15	0	0	20
ROW- Property Management	0	0	0		0	0
Non-Construction Surveying	0	10	75	0	75	90
Geotechnical Exploration *				0	75	50
Construction Materials Testing	0	0	75	0	30	20
Construction Quality Control	0	50	75		40	20
Construction Engineering Inspection	0		0	0		15
Road/Pavement Repair- Patching	40	60	90	90		75
Road/Pavement Repair- Striping	100	90	100		80	100
Road/Pavement Repair-Guardrails	100	100	80	100	80	100
Bridge Repair	20	30	60	0	75	75
Maintenance- Mowing	50	20	25	90	95	100
Maintenance- Debris Removal	65	100	5	90	70	50
Maintenance- Ditching and Draining	30	0	60	0	65	30
Snow and Ice Removal	25	0	0	20	75	50
Traffic Control Maintenance/Upgrade	0	60	80	10	80	50
Rest Areas	0	100	100	100	100	100
Equipment Purchasing- Sedans/Trucks *						
Equipment Purchasing- Heavy Equipment *						
Equipment Maintenance-Sedans/Trucks		100	100	100	90	100
Equipment Maintenance-Heavy Equipment	20	40	0	15	50	20

* Majority of function is handled by Central Office

Table 5: Districts' Recommended Outsourcing Percentages, Districts 7 Through 10

Functions	D7 (%)	D8 (%)	D9 (%)	D10 (%)
Planning	25	25	0	40
Design Phase		70	55	50
Design Phase II		75	60	75
ROW- Appraisals		75	35	70
ROW- Appraisal Review		75	0	60
ROW- Relocation		60	25	0
ROW- Property Management		0		70
Non-Construction Surveying		60	50	50
Geotechnical Exploration *		50		
Construction Materials Testing	0	5	100	0
Construction Quality Control	0	10	90	0
Construction Engineering Inspection	0			
Road/Pavement Repair- Patching	5	60	90	90
Road/Pavement Repair- Striping	99			80
Road/Pavement Repair-Guardrails	95	70	20	50
Bridge Repair	75	20	10	85
Maintenance- Mowing	95	50	15	100
Maintenance- Debris Removal		0		0
Maintenance- Ditching and Draining	75	0	0	75
Snow and Ice Removal	50	0	10	
Traffic Control Maintenance/Upgrade		0		50
Rest Areas			100	0
Equipment Purchasing- Sedans/Trucks *				
Equipment Purchasing- Heavy Equipment *				
Equipment Maintenance-Sedans/Trucks		20	5	80
Equipment Maintenance-Heavy Equipment	20		5	5

* Majority of function is handled by Central Office
(No information from D11 and D12)

OUTSOURCING RECOMMENDATIONS:

The study of outsourcing of KyTC functions has identified several practices in other states, in the Kentucky Districts, and in the Central Office. Outsourcing appears to be increasing and specific processes must be developed by the Central Office. The researchers realize that the KyTC will develop policy for outsourcing activities, but would like to make some general recommendations:

5. A core competency should be maintained for all essential functions of the KyTC to allow for the skill set to conduct basic functions and to monitor outsourced functions.
6. There are significant and valid variations in the need for outsourcing in the districts and the Central Office. A common practice for all is not feasible.
7. Create better processes to evaluate the total costs (direct and indirect) plus the quality of production for the functions conducted by the KyTC and those by external organizations.
8. Other factors to evaluate for outsourcing evaluation: workload requirements, time frame requirements, resources needed, available budgets, and availability of vendors (contractors, consultants, etc.) to do work.

BIBLIOGRAPHY

- AASHTO (1995). *Innovative Transportation Financing*, American Association of State Highway and Transportation Officials, Washington, D.C.
- American Road & Transportation Builders Association (ARTBA). (2004) "Current Reauthorization Status." *Campaign and Grassroots Action Center*.
<http://www.artba.org/tmaw/reauthorization_update.htm>
- Booz-Allen and Hamilton. "Virginia Department of Transportation Public-Private Procurement: Issues and Accomplishments and Interim Reports." Interim Report.
<<http://www.fhwa.dot.gov/tfhrc/safety/pubs/its/resourceguides/vdot.pdf>>
- Chan, A.P.C., Chan, D.W.M., Ho, K.S.K (2003). "Partnering in Construction: Critical Study of Problems for Implementation." *J. of Management in Engineering*. 19(3), 126-135.
- Construction Industry Institute (CII). (1991). "In Search of Partnering Excellence." *Publication No. 17-1, Rep. CII*, Austin, TX.
- Eger, R.J. et al. (2002) "Evaluation of Transportation Organization Outsourcing: Decision Making Criteria for Outsourcing Opportunities." Midwest Regional University Transportation Center. University of Wisconsin, Madison.
- FHWA (1995). *Partnerships in the Implementation of ITS*, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C.
- FHWA (1996). *Rebuilding America: Partnerships for Investment*, Federal Highway Administration, U.S. Department of Transportation, Washington, D.C.
- Maryland Transportation Authority. (2004) *Public-Private Partnership Program*. About the Authority: Meeting Transportation Needs.
<<http://www.mta.state.md.us/mdta/servlet/dispatchServlet?url=/About/partner.jsp>>
- National Academy of Public Administration and The University of North Carolina, *State Departments of Transportation: Strategies for Change*, National Cooperative Highway Research Program Report 371, Transportation Research Board, National Research Council, Washington, D.C. (1995), pp 27.
- Orski, C.K. (2000) "Contracting and Deregulation: The Case for Outsourcing." *Innovation Briefs*. Vol. 11, No. 6.
- The Privatization Council (1991). *Legislative Initiatives for Public-Private Partnerships in Transportation Infrastructure: A Guide for lawmakers*, Executive Summary, The Privatization Council, Washington, D.C.

- Science Applications International Corporation, Transportation Policy and Analysis Center. (2003) "Outsourcing of State DOT Capital Program Delivery Functions." Prepared for NCHRP Web Document 59 (Project 20-24[18]): Contractor's Final Report.
- Sutherland, J. (2002) "Using 3PL Service Providers to Create and Deliver Significant Supply Chain Value." *Achieving Supply Chain Excellence Through technology.* Vol. 4. <http://www.ascet.com/documents.asp?grID=153&d_ID=1020>
- United States Department of Labor. (2004) Employment by major industry division 1992, 2002 and projected 2012. News Bureau of Labor Statistics. Pages 1-2.
- Warne, T.R. (2003) National Cooperative Highway Research Program Synthesis 313. "State DOT Outsourcing and Private Sector Utilization: A Syntheses is Highway Practice." *Transportation Research Board of the National Academies.*
- Witthford, D. K. (1997). National Cooperative Highway Research Program Synthesis 246. "Outsourcing of State Highway Facilities and Services." *Transportation Research Board of the National Academies.*

APPENDIX A

Outsourcing of Primary DOT Functions

STATE DOT QUESTIONNAIRE

PURPOSE OF THIS SURVEY

There are many traditional functions carried out by a DOT that relate to its major responsibility for transportation services. The primary function is that of senior management, which is often called Program Management. The more traditional functions are: Planning, Design, Pre-construction, Construction, Operations and Maintenance. All of these functions require manpower, resources, and senior management attention. For years DOTs have conducted most of their functions with their own resources. There has always been some outsourcing of work, especially for construction services and to a lesser extent, design services. The increasing demands on DOTs today, and changing resources, are causing investigation of alternative methods of accomplishing their essential functions. A major option is to contract out more of its work to external parties, commonly called “outsourcing.” The purpose of this project is to evaluate the effectiveness, benefits and concerns of the possible outsourcing of primary functions by the Kentucky Department of Highways, a division of the Kentucky Transportation Cabinet.

Please complete the following request for information to aid in the processing of this survey:

State DOT: _____

Address: _____

City: _____ State: _____ Zip: _____

Questionnaire Completed By: _____

Position/Title: _____ Date: _____

Telephone: _____ Fax: _____

PLEASE RETURN QUESTIONNAIRE AND SUPPORTING INFORMATION BY: **12/15/03**

TO: Dr. Donn E. Hancher
Civil Engineering Dept.
151B Raymond Building
University of Kentucky
Lexington, KY 40506-0281

TEL: (859) 257-4857 or 257-1864
FAX: (859) 257-4404
email: hancher@engr.uky.edu

THANK YOU FOR YOUR VALUABLE ASSISTANCE ON THIS PROJECT!!

PLEASE WRITE ON THE BACK OF ANY PAGES IF YOU NEED MORE SPACE FOR YOUR RESPONSES. IF YOU PREFER TO RESPOND BY EMAIL, PLEASE SEND ME YOUR EMAIL ADDRESS AND AN ELECTRONIC FILE WILL BE SENT.

1. Please indicate which functions listed that you have outsourcing experience with:

a. **Program Management** (Annual or Multi-year) ___ Yes ___ No

Comments: _____

b. **Planning** ___ Yes ___ No

Comments: _____

c. **Design** ___ Yes ___ No

Comments: _____

d. **Environmental Studies/Permits** ___ Yes ___ No

Comments: _____

e. **Right of Way** ___ Yes ___ No

Comments: _____

f. **Surveying/Photogrammetry** ___ Yes ___ No

Comments: _____

g. **Geotechnical/Materials Testing** ___ Yes ___ No

Comments: _____

h. **Utilities/Railroad Coordination** ___ Yes ___ No

Comments: _____

i. **Contract Procurement (Projects)** ___ Yes ___ No

Comments: _____

j. **Construction** ___ Yes ___ No

Comments: _____

k. **Construction Engineering (Oversight, Inspection, QC/QA)** ___ Yes ___ No

Comments: _____

l. **Maintenance** ___ Yes ___ No

Comments: _____

m. **Traffic Operations** ___ Yes ___ No

Comments: _____

n. **Legal Services** ___ Yes ___ No

Comments: _____

o. **Equipment Purchasing/Maintenance** ___ Yes ___ No

Comments: _____

p. **Rest Areas** ___ Yes ___ No

Comments: _____

q. **Other Functions ???** ___ Yes ___ No

Comments: _____

2. Please circle your outsourcing effectiveness for the functions listed below:

SCALE: 1 2 3 4 5 NA

1 = Negative Effect, 3 = No Change, 5 = Very Effective, NA = no experience

Functions	Quality of Service	Cost of Service
Program Management	1 2 3 4 5 NA	1 2 3 4 5 NA
Planning	1 2 3 4 5 NA	1 2 3 4 5 NA
Design	1 2 3 4 5 NA	1 2 3 4 5 NA
Environmental Studies/Permits	1 2 3 4 5 NA	1 2 3 4 5 NA
Right-of-Way	1 2 3 4 5 NA	1 2 3 4 5 NA
Surveying/Photogrammetry	1 2 3 4 5 NA	1 2 3 4 5 NA
Geotechnical/ Materials Testing	1 2 3 4 5 NA	1 2 3 4 5 NA
Utilities/Railroad Coordination	1 2 3 4 5 NA	1 2 3 4 5 NA
Contract Procurement	1 2 3 4 5 NA	1 2 3 4 5 NA
Construction	1 2 3 4 5 NA	1 2 3 4 5 NA
Construction Engineering	1 2 3 4 5 NA	1 2 3 4 5 NA
Maintenance	1 2 3 4 5 NA	1 2 3 4 5 NA
Traffic Operations	1 2 3 4 5 NA	1 2 3 4 5 NA
Legal Services	1 2 3 4 5 NA	1 2 3 4 5 NA
Equipment Purchasing/Maintenance	1 2 3 4 5 NA	1 2 3 4 5 NA
Rest Areas	1 2 3 4 5 NA	1 2 3 4 5 NA
Other Functions	1 2 3 4 5 NA	1 2 3 4 5 NA

APPENDIX B

Outsourcing of Primary DOT Functions

STATE DOT QUESTIONNAIRE

PURPOSE OF THIS SURVEY

There are many traditional functions carried out by a DOT that relate to its major responsibility for transportation services. The more traditional functions are: Planning, Design, Pre-construction, Construction, Operations and Maintenance. All of these functions require manpower, resources, and senior management attention. For years DOTs have conducted most of their functions with their own resources. There has always been some outsourcing of work, especially for construction services and to a lesser extent, design services. The increasing demands on DOTs today, and changing resources, are causing investigation of alternative methods of accomplishing their essential functions. A major option is to contract out more of its work to external parties, commonly called “outsourcing.” The purpose of this project is to evaluate the effectiveness, benefits and concerns of the possible outsourcing of primary functions by the Kentucky Department of Highways, a division of the Kentucky Transportation Cabinet.

Please complete the following request for information to aid in the processing of this survey:

District Office: _____

Address: _____

City: _____ State: _____ Zip: _____

Questionnaire Completed By: _____

Position/Title: _____ Date: _____

Telephone: _____ Fax: _____

PLEASE RETURN QUESTIONNAIRE AND SUPPORTING INFORMATION BY: **11/19/04**

TO: Dr. Donn E. Hancher
Civil Engineering Dept.
151B Raymond Building
University of Kentucky
Lexington, KY 40506-0281

TEL: (859) 257-4857 or 257-1864
FAX: (859) 257-4404
email: hancher@engr.uky.edu

THANK YOU FOR YOUR VALUABLE ASSISTANCE ON THIS PROJECT!!

PLEASE WRITE ON THE BACK OF ANY PAGES IF YOU NEED MORE SPACE FOR YOUR RESPONSES. PLEASE MAIL OR FAX TO DR. DONN HANCHER AS NOTED ABOVE BY NOVEMBER 19, 2004. THANK YOU FOR YOUR INPUT.

2. Please indicate if you outsource the following functions and comment on why you do or do not. Also, please circle the outsourcing effectiveness for the functions listed below:

SCALE: 1 2 3 4 5 NA

1 = Negative Effect, 3 = No Change, 5 = Very Effective, NA = No Experience

a. **Planning** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Planning	1	2	3	4	5	N/A	1	2	3	4	5	N/A

b. **Design** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Design	1	2	3	4	5	N/A	1	2	3	4	5	N/A

c. **Right of Way** Percentage outsourced now: _____

What percentage of projects are delayed because of "right-to-take" suits? _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Right Of Way	1	2	3	4	5	N/A	1	2	3	4	5	N/A

d. **Non-Construction Surveying** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Non-Construction Surveying	1	2	3	4	5	N/A	1	2	3	4	5	N/A

e. **Geotechnical Exploration** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Geotechnical Exploration	1	2	3	4	5	N/A	1	2	3	4	5	N/A

f. **Construction Materials Testing – QA/QC** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Construction Materials Testing – QA/QC	1	2	3	4	5	N/A	1	2	3	4	5	N/A

g. **Construction Engineering - Inspection** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service	Cost of Service
Construction Engineering Inspection	1 2 3 4 5 N/A	1 2 3 4 5 N/A

h. **Maintenance - Road/Pavement Repair** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service	Cost of Service
Maintenance Road/Pavement Repair	1 2 3 4 5 N/A	1 2 3 4 5 N/A

i. **Maintenance - Bridge Repair** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service	Cost of Service
Maintenance Bridge Repair	1 2 3 4 5 N/A	1 2 3 4 5 N/A

j. **Maintenance - Other** Percentage outsourced now: _____

Please list other maintenance tasks that are outsourced: _____

Comments on future outsourcing: _____

Function	Quality of Service	Cost of Service
Maintenance Other	1 2 3 4 5 N/A	1 2 3 4 5 N/A

k. **Snow and Ice Removal** Percentage outsourced now: _____

How many trucks does your district have? _____

How many truck operators does your district have? _____

What do the drivers do in the off-season? _____

Comments: _____

Function	Quality of Service	Cost of Service
Snow and Ice Removal	1 2 3 4 5 N/A	1 2 3 4 5 N/A

l. **Traffic Control Maintenance/Upgrade** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Traffic Control Maintenance/Upgrade	1	2	3	4	5	N/A	1	2	3	4	5	N/A

m. **Equipment Purchasing/Maintenance**

i. Cars Percentage outsourced now: _____

ii. Trucks Percentage outsourced now: _____

iii. Heavy Equipment Percentage outsourced now: _____

Number of equipment garages/barns in your district: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Equipment Purchasing/Maintenance	1	2	3	4	5	N/A	1	2	3	4	5	N/A

n. **Rest Areas** Percentage outsourced now: _____

Functions currently outsourced: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Rest Areas	1	2	3	4	5	N/A	1	2	3	4	5	N/A

o. **Other Functions???** Percentage outsourced now: _____

Comments on future outsourcing: _____

Function	Quality of Service						Cost of Service					
Other	1	2	3	4	5	N/A	1	2	3	4	5	N/A

APPENDIX C

Outsourcing of Primary DOT Functions

STATE DOT QUESTIONNAIRE

PURPOSE OF THIS SURVEY

We are starting to complete our study on outsourcing for the KyTC and need your input again. A primary survey was sent to all twelve highway districts last fall to determine the current outsourcing practices of each district. We are also working with an advisory committee and the main office departments in Frankfort. After assessing each district's response, it became apparent that each district has distinct needs for outsourcing to fulfill their basic functions and to maintain a consistent level of public service. We believe the decision to outsource varies from district to district which is why your input is greatly valued. Due to possible employment fluctuations expected from an increase in the number of employees retiring from the Cabinet in the next four years, more outsourcing of basic functions may be necessary in the future. It is important to determine which functions are best suited for outsourcing and which functions should continue to be handled by your district. We are asking you to provide constructive comments that will identify which functions are best outsourced in your district if the need arises. We are concerned with your evaluation of the quality and the cost of outsourcing in the past in your district. We have enclosed a copy of the original survey you submitted (for your reference). I will be calling each District Engineer to discuss our needs for this second survey in the next week; you can wait until my contact before starting completion of the survey.

Please complete the following request for information to aid in the processing of this survey:

District Office: _____

Address: _____

City: _____ State: _____ Zip: _____

Original Questionnaire Completed By: _____

Position/Title: _____ Date: _____

Telephone: _____ Fax: _____

PLEASE RETURN QUESTIONNAIRE AND SUPPORTING INFORMATION BY: **03/21/05**

TO:

Dr. Donn E. Hancher
Civil Engineering Dept.
151B Raymond Building
University of Kentucky
Lexington, KY 40506-0281

Cell: 859-338-3472
TEL: (859) 257-1864 or 257-4857
FAX: (859) 257-4404
email: hancher@engr.uky.edu

THANK YOU FOR YOUR VALUABLE ASSISTANCE ON THIS PROJECT!!

3. Please indicate your opinion on outsourcing the following functions and comment on why you do or do not feel that outsourcing these functions in your district is beneficial. Please note the percentage that would be most desirable to outsource, if staffing levels don't increase in upcoming years. Please elaborate on any specific positive or negative experiences you have encountered, and please provide any cost data that you may have regarding your experience with outsourcing each function.

Note: Work handled by the Central Office is not considered outsourcing, but please denote what percentage is handled by the Central office.

a. Planning

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

b. Design - Phase I

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

c. Design - Phase II

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

d. Right of Way- Appraisals

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

e. Right of way- Appraisal Review

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

f. Right of Way- Relocation

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

g. Right of Way- Property Management

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

h. Non-Construction Surveying

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

i. Geotechnical Exploration

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

j. Construction Materials Testing

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

k. Construction - Quality Control

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

l. Construction Engineering - Inspection

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

m. Maintenance - Road/Pavement Repair (Patching)

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

n. Maintenance - Road/Pavement Repair (Striping)

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

o. Maintenance - Road/Pavement Repair (Guardrail Repair)

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

p. Maintenance - Bridge Repair

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

q. Maintenance – Mowing

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

r. Maintenance – Debris Removal

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

s. Maintenance – Ditching and Draining

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

t. Snow and Ice Removal

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

u. Traffic Control Maintenance/Upgrade (Signal Work)

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

v. Rest Areas

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

w. Equipment Purchasing- Sedans/Pickups

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

x. Equipment Purchasing- Heavy Equipment

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

y. Equipment Maintenance-Sedans/Pickups

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

z. Equipment Maintenance- Heavy Equipment

Should outsource: _____ Should not outsource: _____ Undecided: _____ (please check)

Percentage of this function your district is currently outsourcing: _____

Desirable percentage this function could be outsourced in the future: _____

Maximum percentage this function could be outsourced in your district: _____

Quality experience in your district: _____

Cost experience in your district: _____

4. Please answer the following questions concerning your district's current and future staffing needs.

How many employees do you anticipate losing to retirement by the year 2008?

Which of your departments will suffer the most? _____

Have you experienced or do you anticipate any difficulties in hiring quality employees to replenish your staff? _____

If so, were these problems financially based (i.e. lack of competitive salary) or experienced based ?

