STRATEGIES TO STRENGTHEN CONSULTANT MANAGEMENT IN THE GEORGIA DEPARTMENT OF TRANSPORTATION

GDOT Research Project Number 2020

TASK 4: CASE STUDIES OF GDOT CONSULTANT MANAGEMENT PROJECTS

PREPARED FOR THE GEORGIA DEPARTMENT OF TRANSPORTATION

BY THE GEORGIA INSTITUTE OF TECHNOLOGY'S
Schools of Public Policy and Civil & Environmental Engineering

Georgia Institute of Technology
SCHOOL OF PUBLIC POLICY
A Unit of the Ivan Allen College

Georgia Institute of Technology
School of Civil & Environmental Engineering

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CONTRIBUTING AUTHORS INCLUDE:
DR. GORDON KINGSLEY
SHELDON GEN
JESSICA PALMIOTTI
CRAIG TIMMONS
PATRICK WOLFE
HEATHER HALL

THIS RESEARCH WAS PREPARED UNDER THE DIRECTION OF

DR. GORDON KINGSLEY
SCHOOL OF PUBLIC POLICY

GEORGIA INSTITUTE OF TECHNOLOGY, ATLANTA

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ABBREVIATIONS

CEI	Construction, Engineering, and Inspection
DOEs	Determinations of Eligibility
DOT	Department of Transportation
FHWA	Federal Highway Administration
GDOT	Georgia Department of Transportation
GRIP	Governor's Road Improvement Plan
GTA	Georgia Technology Authority
ITS	Intelligent Transportation System
LGPA	Local Government Project Agreement
NEPA	National Environmental Protection Act
OCD	Office of Consultant Design
RFP	Request for Proposals
RFQ	Request for Qualifications
SOW	Statement of Work

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DISCLAIMER

The opinions and conclusions expressed or implied in this report are those of the researchers. They are not necessarily those of the Office of Materials and Research or of the Georgia Department of Transportation. Any errors or omissions are the authors. This draft report has not been edited by the Georgia Department of Transportation.

ABSTRACT

Over the past 10 years the Georgia Department of Transportation (GDOT) has increasingly relied upon consultants for engineering design, inspection and other transportation-related professional services. In this report twelve case studies are presented, each examining a distinctive consultant contract. A logic model is developed so that each case explores preconditions, contracting, implementation, evaluation/outcomes, causal links and lessons learned.

The report is part of a series of studies commissioned by GDOT. It provides insight on three important dimensions of consultant management within GDOT. First, this report compares consultant management practices among the different offices of each of the three major branches of the agency. This organizational cross-section of cases enabled assessment of the robustness of consultant management procedures across the agency. Second, this report draws and compares cases from the early 1990s to the present. This temporal profile of cases facilitated analysis of the changes in GDOT consultant management practices since the early 1990s. Lastly, this report includes the perspectives of both the members of GDOT and the particular consultants involved in each of the 12 projects; comparison made it possible to determine where consultant and GDOT perspectives converge or diverge.

PROJECT OVERVIEW

The number of consultants employed by the Georgia Department of Transportation (GDOT) has grown dramatically. GDOT executives estimate that consultants now conduct 50% of the design engineering work and other professional services that GDOT performs – up from 10% less than 10 years ago. Large numbers of consultants are being used in 32 of GDOT's offices, performing activities vital to the core missions of GDOT and representing $450 million dollars in consultant contracts over the last 3 years. This has led many state DOT officials to ask fundamental questions about the nature of the managerial systems and organizational designs needed to operate in this new environment.

Public organizations throughout the United States have increased reliance upon the private sector to fulfill core mission activities; illustrating that state DOTs are not unique in their struggles to make effective use of an increasing number of consultants. This research is designed to explore the many factors that influence the effective use of large numbers of consultants by GDOT. This focus on effectiveness requires an assessment of the current managerial systems and procedures used by GDOT and other state DOTs in consultant management, as well as an analysis of the contribution (or hindrance) of existing managerial systems and procedures to the quality of both the consultant management process and project objectives.

Accordingly, there are several task reports produced by this research. Each report is concerned with accomplishing at least one of the elements of the research design. Table 1 provides a list of the task reports produced from the research and the sources of data from which they were developed. Each of these studies examines consultant

management from a distinct perspective. The Systems Review (Task 2) and the Survey of GDOT Managers (Task 5a) observe the perspectives of managers inside GDOT. The Literature Review (Task 1), Best Practices Case Studies (Task 3), and the Consultant Report (Task 5b) capture the perspectives of stakeholders and professionals external to GDOT. The Project Case Studies (Task 4) examines the perspectives of GDOT managers and external stakeholders as they interface in the consultant management process. The Interim Report (Task 6) triangulates across reports 1 through 5b in order to determine areas of convergence and divergence in the data and summarize the various recommendations from each of these reports.

Table 1: Task Reports and Data Sources

Task Report	**Data Source**
Task 1: Literature Review	Reviews of the professional and academic literatures on consultant management. Interviews with experts in managing state DOT systems.
Task 2: Systems Review	Interviews with senior GDOT managers at the office head level and above. N=24
Task 3: GDOT Project Case Studies	Interviews with GDOT managers and consultants associated with 12 GDOT sponsored projects. Also a review of the archival evidence associated with each project.
Task 4: Best Practice Case Studies	Telephone interviews with state DOT officials in 16 states. Face-to-face interviews with DOT officials in Florida, Ohio and Pennsylvania.
Task 5a: Survey of GDOT managers	Mail survey of GDOT managers engaged in working with consultants. Responses from 21 GDOT offices; N=286, Response Rate=77%
Task 5b: Consultant Report	Compilation of 7 GDOT and DOAS databases into a unified list of GDOT consultants. Face-to-face interviews with consultants. Responses from 22 firms; N=54.
Task 6: Interim Report	Summarizes findings of Tasks 1 through 5b and provides recommendations for enhancing effectiveness of GDOT consultant management practices.

This research was conducted by a team from the Georgia Institute of Technology's School of Public Policy and School of Civil and Environmental Engineering. The team was contracted by GDOT to study its consultant management practices and provide recommendations on the effective use of its consultants.

The contract began in the spring of 2002 and will be completed in the spring of 2004. In the midst of the contract period, GDOT hired a sub-consultant, The North Highland Company, a management and technology consulting firm, to design and update GDOT procedures for managing consultants. The work of North Highland builds upon the research conducted at Georgia Tech. Although information was shared between the Georgia Tech team and North Highland, the efforts of the two teams were separate, and independent products were developed. GDOT and Georgia Tech have signed a supplemental agreement expanding the scope of the work to include a new phase for a study on the human capital skills sets required to manage GDOT consultants, which will commence immediately and conclude in the spring of 2004.

EXECUTIVE SUMMARY

This portion of the consultant management research project reports the results of 12 case studies of GDOT projects that utilized consultants. Each case study was developed using a logic model describing the possible linkage between managerial practice and the effective use of consultants. The comparative analysis of the cases allows the project team to variance in consultant management practices and effectiveness standards across the agency and over time. It also allows the project team to compare the perspectives of these managerial GDOT personnel and consultants on GDOT's practices. Practices have developed during a time in which GDOT has dramatically increased the use of consultants for engineering design services.

This analysis revealed several patterns in GDOT practices. They are summarized below under the headings of the major phases of consultant management.

Preconditions

- The relationship between GDOT and consultants has evolved over the last 12 years. In that evolution, consultants have come to play an integral role in GDOT operations, and GDOT personnel have come to accept the prominence of the consultants' role.
- A firm's size and experience with GDOT affect the consulting relationship. GDOT pursues policies designed to reach out to small firms and Disadvantaged Business Enterprises. However, current consultant managerial practices have had the effects of favoring large and experienced firms and make entry into GDOT consultancy more difficult for small firms and inexperienced firms.

- GDOT project managers' relationships with preconstruction consultants and CEI consultants are different. Their relationship with the former can be characterized as a relationship between a service provider and a client. Their relationship with the latter is a much closer one in which GDOT staff view the consultants as extensions of staff.

Contracting

- In projects where project tasks are divided between GDOT offices and the consultant contracts, there is greater demand for coordination between the two parties but an insufficient supply of such coordination. This usually results in delays in project delivery. When project tasks are contracted to the consultant entirely the consultant has greater control of work flow which can result in more efficient project delivery.
- Processes of consultant selection vary from qualifications-based selection processes to procurement processes. Federal and state regulations require qualifications-based competitive processes for consultant projects. In the cases there is evidence of hybrid approaches that blend qualification-based processes with low-cost bid processes similar to procurement. The direct solicitation of consultants under procurement with known records of success with GDOT increases efficiency in the contracting and implementation phases of consultant management.
- There is variance in GDOT project managers' perceptions of their responsibilities in contract administration. Some view contract administration responsibilities as

their own, while others doubt their ability or authority to influence contract administration processes.

Implementation

- Consultants new to GDOT require more guidance from GDOT project managers than those with GDOT experience. However, GDOT project managers are sometimes too busy to provide such guidance. The guidance needed is usually focused on GDOT policies, procedures, and norms, not on technical issues.
- GDOT project managers who are new to consultant management need greater training in consultant management. The demand for more managers of consultants sometimes thrust personnel into that role who lack the requisite experience.
- GDOT project managers exhibit two styles of consultant management. A hands-off, laissez-faire approach is used when the consultant has previous experience with GDOT and the GDOT project manager trusts the consultant's ability to perform. A hands-on, active management style is used when 1) the project is complex, unique or has high public visibility, 2) the consultant is new to GDOT, or 3) there is turnover in the GDOT project manager role. Evidence from case studies indicates that active management is sometimes viewed as burdensome by the GDOT project managers.
- Changes in GDOT personnel during a consultant project have significant impacts, ranging from delays to changes in direction or procedures.

Effectiveness

- There is much variance in consultant performance evaluation. While all consultants interviewed agree that formal evaluations from GDOT are highly desired to help them refine their processes and products, GDOT project managers do not consistently provide them.
- GDOT project managers and consultants have overlapping views about the most important measures of a project's effectiveness. Both agree that the quality of the output and its completion on schedule are important measures. GDOT project managers also add the consultant's ability to work with minimal guidance as an important measure, because they have little time to provide much guidance to each consultant. This partially explains why there is a preference for consultants with prior GDOT experience.
- GDOT project managers and consultants also have overlapping views about the most important determinants of an effective project. Both agree that strong communication and coordination, a long-term relationship between GDOT and the consultant, and the consultant's understanding of GDOT and government policies and procedures are important factors in a project's success.

Exogenous Variables

- The high volume of work carried by some GDOT project managers partly explains why they favor contracting firms that have former GDOT employees in their ranks or have previous contracting experience with GDOT or understand GDOT procedures. Such firms reduce managerial demand on the project

managers, because they are intimately familiar with GDOT policies, procedures and norms. GDOT project managers also place much trust in such firms.

- A cadre of senior technical staff has been retiring from GDOT, and they are being replaced by younger engineers who require additional training and experience to manage consultant projects. This demographic dynamic of GDOT engineers and inspectors affects consultant management, especially the contracting and implementation phases.

- These findings exemplify the variance in consultant management practices in GDOT. They also point to the areas in which GDOT project managers have excelled, as well as other areas that need attention. Overall, GDOT project managers in these cases usually had a very strong focus on efficiency and the quality of the output. Sometimes, however, the strive for efficiency has hindered other aspects of consultant management.

OVERVIEW OF THE CASE STUDY REPORT

This research project is designed to explore factors that influence the effective use of large numbers of consultants by GDOT. The focus on effectiveness means that we are examining how existing managerial systems contribute to or hinder the maximization of the quality of consultant contributions to achieve project objectives. Specifically, this portion of the project reports the results of case studies of GDOT projects utilizing consultants.[1] This report provides insight on three important dimensions of consultant management in GDOT. First, the case studies allow a comparison of consultant management practices in different offices of each of the three major branches of the agency. This organizational cross-section of cases enabled the research team to determine the variance in consultant management procedures across the agency. Second, the report offers a comparison of consultant management practices at different times in GDOT's history. Cases were drawn from the early 1990s to the present. This temporal profile of cases allowed us to describe changes in GDOT consultant management since the early 1990s. Third, the report permits evaluation of consultant management practices from different perspectives. Each case includes the perspectives of both GDOT and the consultant. Each case affords an opportunity to observe where the two perspectives converge or diverge, and to identify what each actor sees as the strengths and weaknesses of consultant management in GDOT.

After a brief description of hypothesized relationships and an overview of the cases, this report discusses the findings from the collective analysis of the 12 cases. These are conclusions that were drawn from a comparison of cases, not conclusions from

[1] For a description of the case study method of social research, see Appendix A.

individual cases. They describe the nature of consultant management in GDOT, the factors that affect it and prescriptive changes suggested from the analysis of the cases. Finally, a synopsis of each of the 12 cases from which all these conclusions were drawn are included in Appendix B.

SECTION I: ANALYTICAL FRAMEWORK

Logic Model of Effectiveness

With a focus on the effective management of consultants, the analysis of the cases in this study followed a logic model developed by the research team. A logic model is an explicit conceptualization of a chain of events over time, describing relationships among independent and dependent variables.[2] The model is sufficiently detailed to operationalize the variables so researchers can systematically identify the variables in a case and determine whether the hypothesized relationships are supported. The use of logic models in case studies brings structure to the analysis and improves the rigor of the case study method.

In this study, the primary dependent variable of interest is the effectiveness of consultant management. This includes GDOT's and the consultants' perceptions of the output and outcomes of the projects and their satisfaction with them. Our hypothesized independent variables are those making up the general phases of consultant management: preconditions, contracting, and implementation. Preconditions include the characteristics of the project, its context and history, and the relevant characteristics of the organizations and people involved. Contracting includes the formal aspects of consultant procurement, from deciding to use a consultant to the Notice to Proceed. Implementation includes the

[2] Yin 1994, pp.118-119.

daily management of the consultant through the completion of the project. Each of these phases, it is hypothesized, affects the next in the sequence and ultimately determines how effective the project is. This line of causal effects reflects the formal process of consultant management described to us by GDOT managers and consultants and reported in the system review of consultant management.[3]

However, we also recognize that formal processes do not always govern organizational behavior. So we hypothesized that any of the independent variables can have a direct effect on effectiveness and the other independent variables following them. Preconditions, such as a long work history between GDOT and a consultant, might directly cause a project manager to use a hands-off approach to consultant management during implementation. A complex scope of work in the contracting phase might directly affect the probability of a successful output in the effectiveness phase. Also, exogenous variables not accounted for in the formal process might also affect any of the independent and dependent variables. These might include environmental factors in an open-systems model of the organization, such as policies handed down from legislative and executive authorities.

Figure 1 illustrates the logic model developed for these case studies. Each of the 4 major variables in the model includes several operational measures that were recorded in each case. Table 1 lists example measures under each variable. Extrapolating the causal relationships hypothesized in Figure 1 onto the operationalized variables listed in Table 1, one can see how the number of possible relationships between variables quickly multiplies. Each case was written with the variables in this logic model as a guide, and

[3] Georgia Institute of Technology's Schools of Public Policy and Civil & Environmental Engineering 2002-B.

the logic model itself as an embodiment of the hypothesized relationships in consultant management. This brought uniformity to the analysis of each case, and facilitated a cross-case analysis.

Figure 1: Logic model

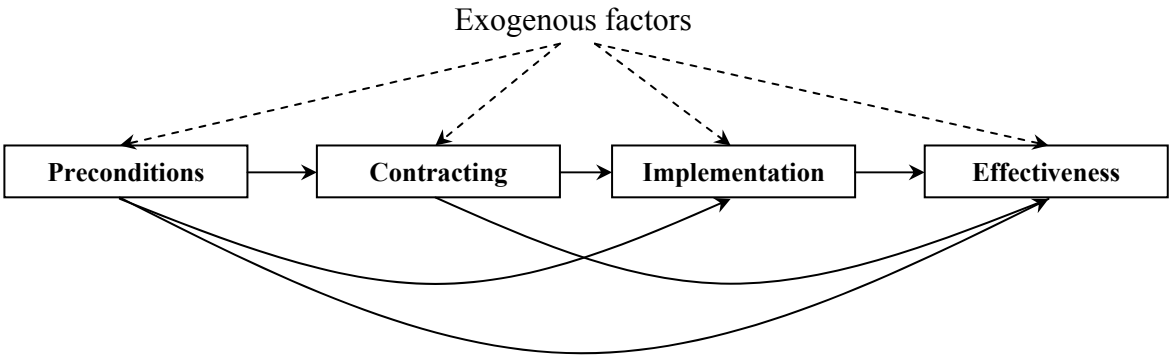

Table 2: Measures of variables in the logic model

Preconditions	Contracting	Implementation	Effectiveness
Project description ▪ Purpose ▪ Project ▪ Time ▪ Location GDOT structure ▪ Division, office ▪ Financing Consultant description ▪ Size ▪ Location History ▪ Prior relationships ▪ Experience	Deciding to use a consultant ▪ Rationale ▪ Authorization Solicitation ▪ Advertisement ▪ Invitation Selection ▪ Competitive ▪ Non-competitive Contract type ▪ Lump sum ▪ Cost plus fixed fee ▪ Task order ▪ LGPA Contractual relationships ▪ Subcontractors ▪ MPOs ▪ Local government Contractual Tasks	Personnel ▪ Experience ▪ Roles Training ▪ Formal ▪ Informal, OTJ ▪ Written guidance ▪ GDOT human capital Communications ▪ Modes ▪ Frequency Monitoring ▪ Deliverables ▪ Reports, updates ▪ Feedback Changes ▪ Scope, tasks ▪ Personnel ▪ Procedures ▪ Standards ▪ Equipment, materials, software, etc.	Output ▪ What ▪ When, delays ▪ Quality ▪ Price, costs Measures of effectiveness ▪ GDOT ▪ Consultant Performance evaluation Satisfaction ▪ GDOT ▪ Consultant ▪ Public

SECTION II: CROSS-CASE ANALYSIS

Overview of the Cases

The 12 projects investigated for this case study report were selected by the research team from several projects nominated by office chiefs in GDOT.[4] The researchers intentionally selected contracts that were managed by project managers in different offices and that involved a variety of consulting firms. In addition, the cases cover a broad span of time. The earliest contract was signed in 1991, while the most

Table 3: The Cases

Case #	GDOT Office	Contract Year	Contract Type	Type of Work
1	Roadway Design	1994	Cost-plus-fixed-fee	Design
2	Right of Way	2000	Lump-sum	Property acquisition
3	Urban Design	1991	LGPA	Design, property acquisition, environmental assessment
4	Bridge Design	2000	Lump-sum	Design
5	Environment and Location	1998	Cost-plus-fixed-fee	NEPA document preparation
6	Maintenance	2000	Lump-sum	Maintenance plans
7	Planning	2001	Cost-plus-fixed-fee	Planning study
8	Information Technology and Management	1998	Task-order	Software development
9	District 4	2001	Task-order	Construction engineering and inspection
10	District 5	1999	Task-order	Construction engineering and inspection
11	Consultant Design	2001	Task-order	Design, environmental assessment
12	Consultant Design	1998	Task-order	Design

[4] For a more thorough description of the selection process, data collection, and analysis process, see Appendix A.

recent contract was signed in 2001. GDOT relied heavily on the consultant for each of these cases. Table 2 summarizes the strata that the 12 cases represent.

Preconstruction offices account for 8 of the 12 cases. This large representation was intended, because their use of consultants is greater than that of other divisions. Still, within that division several offices are represented including non-design offices. Offices under the Treasurer and the Deputy Commissioner are also represented, and they diversify the tasks for which GDOT contracts consultants. Planning and information technology functions are represented in 2 cases, and construction engineering and inspection are represented in another 2 cases. Three main types of contracts are also represented in the pool: lump-sum, cost-plus-fixed-fee and task-order. One case used a local government project agreement (LGPA) with a municipality to indirectly manage the consultant. Finally, the 12 cases also represent a good mix of small and large consultant firms with different levels of experience with GDOT.

Comparison of the 12 cases reveals cross-case findings discussed in this section. These findings are categorized under the variables identified in the logic model.

Preconditions

Cross-case analysis reveals three preconditions that have affected or currently affect consultant management in GDOT: (1) a recent evolution in the relationship between GDOT and consultants, (2) characteristics of consultants and (3) the type of work contracted to consultants.

Recent Evolution in GDOT / Consultant Relations

GDOT has experienced recent changes in its relationship with consultants. Prior to the 1990s, the use of consultants was usually limited to supplemental labor (e.g.,

drafting) that was directly supervised by GDOT project engineers.[5] Consultants tended to be procured through low-bid processes. GDOT managers indicated that they placed little trust in consultants during these projects and engaged in heavy oversight of their work. In the early 1990s, however, this relationship began to change. This was due in part to national trends of increased demands for transportation services combined with limited or declining government staff levels.[6] Consultants working for GDOT saw an increased scope of their responsibilities. They were now tasked to take the lead roles in project development. Case 3 is an early example of how GDOT used consultants to provide all preconstruction services. Procurement of consultants also began to change toward a qualifications-based selection process. Case 1 is an early example of the use of qualifications-based selection, happening in 1993. Thus, in this period GDOT expanded the role of consultants in their activities and developed greater trust in them. This trust was given as a matter of necessity and did not come easily to GDOT project managers. Senior executives recall having to enforce greater trust as they routinely found GDOT project managers treating consultants like high-paid draftsmen.

More recently, the relationship between GDOT and consultants has further changed. Cases since the late 1990s provide anecdotal evidence of a growing dependence on consultants by GDOT that is due to a stagnant or shrinking staff size coupled with increased demands for transportation services.[7] The advent of the Office of Consultant Design reflects the establishment of an on-going role for consultants with

[5] While this study included no cases from this period, a GDOT official from Case 1 provided anecdotal evidence, and previous interviews with GDOT managers at and above the office head level support this description.
[6] Georgia Institute of Technology's Schools of Public Policy and Civil & Environmental Engineering 2002-A.
[7] Cases 2, 4, 5, 6, 9, and 10.

GDOT. Evidence from the case studies also suggests that by this time the view of consultants held by many GDOT project managers has changed from one of skepticism and lack of trust to one that sees consultants as an integral part of GDOT operations[8] and even their own career advancement.[9] This trend has taken place at the same time that a cadre of GDOT retirees is moving into the ranks of consulting firms. In other words, consultancy is becoming a career move for former GDOT employees. Case 9 is an excellent example of this trend. In that case a GDOT project manager got a job with a GDOT consulting firm within months of his retirement from GDOT.

Consultant Characteristics

Two characteristics of firms have significant influence on the relationship with GDOT: size and previous experience with GDOT. A small firm has only local offices and a small staff of fewer than 50. Sometimes they are as few as one, as in Case 2. A large firm could have a regional or national presence, or it could be a local firm with a large number of employees. Experience with GDOT takes two forms. First, a firm can have previous experience as a consultant for GDOT. Second, a firm can have in its employment former GDOT employees in key roles of a contract, which give it advantages similar to those of having previously been contracted with GDOT. Some firms in these cases have both of these kinds of experience, but even those with just one realize benefits. The 12 cases provide distribution of firm size and GDOT experience characteristics that is representative of the population of GDOT projects. Table 3 illustrates the distribution of the 12 cases.

[8] Cases 4, 6, 7, 9, 10, 11, and 12.
[9] Cases 9 and 10.

Table 4: Cases by Firm Characteristics

	Experienced with GDOT	Inexperienced with GDOT
Small Firm	Cases 2*, 6, 11	Cases 1, 2*
Large Firm	Cases 3, 4, 5, 7, 9, 10, 12	Case 8

* Case 2 has two prime consultants.

As the table shows, ten of the cases involved either large firms or firms with some experience with GDOT. A majority of cases have consultants that are both large and experienced with GDOT.

Size matters. In Case 1, a small firm sought contract work with GDOT, with hopes that success on its first GDOT contract would lead to multiple contracts from the department and the growth of the firm. However, the consultant perceived that GDOT would not give the firm more than one project at a time, *because* it is a small firm. The consultant suspected that GDOT feared that multiple contracts or more complex projects might overwhelm a firm of limited resources.[10] Ironically, this not only kept the small firm small, but it also made the limited work it got more difficult to manage, because its project portfolio remained small, and its ability to retain human resources remained weak. The consultant saw this policy as a disadvantage when competing for GDOT projects.

Small firms also may rely financially on GDOT more heavily than larger firms, because each GDOT project represents a greater portion of its portfolio than that of the portfolio of a larger firm. Thus, smaller firms are also more greatly impacted by administrative delays of GDOT, losses of potential contracts, etc. In Case 6, for example,

[10] From the GDOT perspective, however, considering the size of this firm and the great amount of competition in the consultant market, this small consulting firm has received a decent amount of subsequent contracts.

the consultant reported the need to borrow money to pay staff salaries because of GDOT delays in paying invoices. The same firm also reported starting its project before the formal Notice to Proceed, because it had already procured the staff it needed for the project and could not wait for GDOT's formal notification. The firm finally received the Notice to Proceed 4 months after negotiation of fees, and it submitted its first invoice the following day.

Large firms, on the other hand, reported that they are less affected by delays or consultant management practices in GDOT, because they have larger portfolios of projects, among which they can shift human resources if one project is stalled.[11] The consultant in Case 3, for example, saw GDOT as a secondary source of work, with the bulk of the firm's projects coming from municipalities. The larger portfolios also give large firms a competitive advantage in being able to steadily employ people with specialized skills.[12]

Experience matters. Experience is highly regarded by GDOT project managers. In 6 of the cases[13] the GDOT project managers expressed the consultants' prior experiences with GDOT as positively impacting management or outcome, and in one case[14] a GDOT project manager cited the consultant's inexperience with GDOT as negatively impacting consultant management efforts.

One way project managers cope with the demands of large work loads is to use consultants who have prior GDOT experience.[15] The rationale is that such consultants need little guidance or active management, because they have intimate experience in

[11] Cases 3, 4, and 7.
[12] Cases 4, 5, and 7.
[13] Cases 2, 3, 6, 9, 10, and 11.
[14] Case 2.
[15] Cases 2, 6, 9, and 10.

GDOT procedures and norms. Thus, the project managers can spend their time on other projects. Two other reasons for favoring consultants with GDOT experience were also cited. In Case 6 the GDOT project manager claimed that an experienced consultant can implement the project faster than an inexperienced firm. Firms with GDOT experience, he explained, already have all necessary GDOT safety training, so they can save the time that a new consultant would need to get such training. In Cases 9 and 10, GDOT managers particularly favored contracting consultants that use retired GDOT employees on GDOT contracts. To them, retired GDOT inspectors hold a wealth of experience that should be passed on to the younger, less experienced inspectors remaining at GDOT. Thus, contracting a consultant with these retired GDOT inspectors provides a means for the senior inspectors to work with and train young GDOT inspectors.

A firm can overcome its lack of experience with GDOT. National firms or large firms compensate for lack of GDOT experience through their reputation or specialized skills.[16] The consultant for Case 8, for example, won that contract with its technical expertise in information technology, among other things. Another strategy inexperienced firms employ to get their first GDOT contract is to bid very low for the project.[17] Case 4, for example, involved a qualifications-based selection process, but the short-listed firms were all issued requests for cost proposals in a low-bid competition. The consulting firm that ultimately won that contract had not had a previous GDOT contract, but it did have a former GDOT employee who estimated how low the firm should bid to ensure it was the lowest bidder. The firm's strategy was to land a first GDOT contract, even if it meant a

[16] Cases 7 and 8.
[17] Cases 4 and 10.

financial loss, in order to establish a relationship with GDOT and poise itself for subsequent contracts.

Also, in one case GDOT made an active effort to give a consultant with no GDOT ties some experience with GDOT in order to expand their pool of consultants.[18] GDOT managers and consultants alike indicated during case study interviews that these have been the exceptions, not the rule. Indeed, some GDOT project managers defend their strategy favoring the familiar firms very simply: they do not have the time to manage a consultant new to GDOT.[19] Consequently, inexperienced firms still have a hard time landing a first GDOT project.

Despite the advantages of having former GDOT employees on staff, one firm in the case studies did not seek former GDOT employees. The firm in Cases 5 and 12[20] reported that they deliberately refrained from hiring former GDOT employees because of the appearance of impropriety it might convey. It should also be noted that the lack of former GDOT employees or the lack of prior GDOT experience does not preclude a firm from the successful completion of the project. Indeed, in all three cases that used consultants new to GDOT, the consultants' outputs were praised by the GDOT project managers.[21]

Type of Work

The type of work affects the relationship between the consultant and GDOT. In preconstruction, consultants are typically tasked to develop and deliver a product, such as construction plans or a study, and the consultant and GDOT take the roles of service

[18] Case 1.
[19] Cases 2 and 6.
[20] The same consulting firm was used in both cases.
[21] Cases 1, 2, and 8.

provider and client, respectively. These roles describe their working relationship.[22] In construction, however, consultants are tasked to perform specific duties (construction, engineering, and inspection) but not necessarily for specific projects. In this role, they work side-by-side with GDOT employees to supervise construction, but they are not delivering a product to GDOT. Thus, GDOT employees view such consultants as extensions of GDOT staff and their working relationship is much closer than that between a preconstruction consultant and GDOT.[23]

Contracting

Evidence from the cases reveals three aspects of the contracting phase of consultant management that affect or are affected by other phases: (1) the division of tasks between GDOT and the consultant, (2) variance in consultant selection processes and (3) ownership of contract administration responsibilities.

Division of Tasks between GDOT and the Consultant

In the design cases presented in this report, the preconstruction offices decided individually whether their tasks in the projects – design, environmental assessment, right-of-way acquisition, etc. – were to be done in-house or by a consultant. In these case studies, the usual result was the division of the project tasks between GDOT preconstruction offices and the consultant.[24] In most preconstruction projects there is a senior manager responsible for the entire project. Then there is a consultant liaison who also refers to his or herself as a project manager, who is responsible for the individual consultant contract. This division demands much coordination between GDOT and the consultant, but evidence from the cases shows that such coordination does not always

[22] Cases 1, 2, 3, 5, and 6.
[23] Cases 9 and 10.
[24] Cases 1, 2, 4, 5, 11, and 12.

happen.[25] For example, in Case 1 the consultant was tasked to perform design tasks, while GDOT's Office of Environment and Location opted to perform the environmental assessment in-house. At one point during the contract, the consultant needed information from the environmental assessment in order to proceed with designs. However, the Office of Environment and Location had not yet completed their assessment, and the designs were thus delayed.

On the other hand, when the preconstruction offices decide to contract out all of their tasks and all the tasks are assigned to one consultant, less coordination between GDOT and the consultant is demanded, and the consultant has greater control of work flow. The consultant in Case 3 attributed the firm's success on that project to the fact that it was tasked with all preconstruction activities. The consultant felt the output was produced much more efficiently than it would have been if the preconstruction task had been divided between multiple parties.

Sometimes GDOT deliberately divides a project between GDOT and the consultant or among multiple consultants as a method of introducing consultants new to GDOT.[26] The rationale is that a smaller project would be easier to manage and thus would help the consultant be successful in its first contract with GDOT. In Case 1, a roadway design project was divided into three pieces and assigned to three different consultants, one of which was new to GDOT. Ironically, this division of tasks can actually make the consultant's work more difficult, because more coordination is demanded and the consultant has less control over work flow.

[25] Cases 1, 4, and 5.
[26] Cases 1 and 2.

Two alternative solutions to the problem of the distribution of tasks were suggested by affected consultants.[27] The first solution is for the consultant and the GDOT project manager to provide greater coordination demanded by such projects. This is no easy task, as the consultant and each relevant GDOT office have multiple demands to meet in addition to the coordination of their common project. Also, the GDOT office managing the consultant might not have any authoritative leverage over other offices on which the project depends. There was little evidence of senior project managers addressing coordination communication projects. The second solution suggested is for GDOT preconstruction offices to collectively decide whether all the tasks of a project are done in-house or contracted out. This way, entire projects are done by either a consultant or GDOT, but not both.

Variance in Consultant Selection

Evidence from these case studies indicates that GDOT offices follow a competitive process when consultants are selected on a qualification basis.[28, 29, 30] There are cases where the process begins using a qualifications-based approach to select the top three firms, but then shifts to a low-bid process for the final selection. There are also cases where project managers' descriptions of the process and the archival evidence are not in agreement. The records describe a competitive process, but the shop talk is one of direct solicitation. Under a procurement process this is less a cause of concern than under

[27] Cases 1 and 3.
[28] Cases 1, 4, 6, 7, 8, 9, 11, 12.
[29] One case, Case 10, used a competitive, low-bid selection process.
[30] There is also variance in the competitive, qualifications based selection processes. However, they tend to include a public advertisement or solicitation of pre-qualified firms, a request for proposals from a short list of firms, and negotiations with the top ranked firm or competitive bidding by the top ranked firms. Variance lies in development of the short list of firms, the criteria of evaluation, and the determination of costs.

a qualifications-based process.[31] Consultant procurement regulations require competitive processes except in emergencies or near monopolies.[32]

Some GDOT project managers in the case studies defended such practices as an efficient means of consultant selection and ultimately project delivery. Consultants with known records of success with GDOT save time in the contracting phase and save managerial effort in the implementation phase. At the same time, there is high likelihood of an acceptable output. These advantages are accentuated when a GDOT project manager has several projects to manage.[33]

Contract Administration Responsibilities

There was variance in GDOT project managers' perceptions of their responsibilities in contract administration. The cases strongly suggest that project management in GDOT is typically done by someone with technical training in the area of the contracted project.[34] In the case studies, design projects were managed by design engineers, the environmental assessment project was managed by environmental specialists, the acquisition project was managed by a real estate expert, etc. However, these different project managers had starkly different views about who was ultimately responsible for contract administration tasks, such as seeing a contract through audits, seeing authorizations and notifications through their proper channels, seeing invoices through accounting, etc. Some saw it as their own responsibilities as the project

[31] Cases 2 and 5. In Case 2, records show that a competitive process was followed. However, only one firm applied for each of the two contracts in that case, and all the interviewees in the case agreed that the consultants were directly solicited and selected. In Case 5, no competitive process was followed.
[32] The Office of Environment and Location (Case 5) was found to have been in violation of such regulations in the past (e.g., the Brook's Act), but that office has since changed its selection process to a competitive process.
[33] Case 2.
[34] All cases.

manager,[35] while others found such administrative processes as events outside their authority or influence.[36] In Case 6, the selected consulting firm mobilized its work team and awaited the completion of contract negotiations and the issuance of the Notice to Proceed. However, the pre-award audit took longer than both the consultant and the GDOT project manager anticipated and thus delayed the Notice to Proceed. This led to an instance where the consultant proceeded with the project work while the Office of Audits continued its pre-award audit.

Implementation

Three significant observations on the implementation phase of consultant management are apparent from the cross-case analysis. First is a need for training for specific consultants and GDOT personnel. Second there are different management styles used by GDOT project managers and different demands for them. The third observation is the effects of attrition on a project.

Training

Consultants new to GDOT require more guidance than those with GDOT experience. This is intuitively obvious, but it cannot be overstated, because the GDOT project managers in these cases were sometimes reluctant to provide extra attention to new consultants.[37] The guidance that new consultants need is on GDOT administrative procedures and technical standards, and even more importantly on the norms of GDOT operations and the values they reflect.[38] In Case 2, for example, an acquisition consultant frequently asked the GDOT project manager about the adequacy of counter-offers from

[35] Cases 5, 11, and 12.
[36] In Case 6, the project manager allocated this responsibility to a subordinate whose duty it was to try and track and facilitate the procurement process.
[37] Cases 2 and 6.
[38] Cases 1 and 2.

property owners. The consultant asked not because of unfamiliarity with real estate value, but because of unfamiliarity with GDOT norms for counter-offers. An orientation program for consultants new to GDOT could help the administrative and technical standards adjustments but probably not the organizational cultural adjustment. GDOT project managers, however, could assist new consultants in learning GDOT norms.

New GDOT project managers also need some training in consultant management.[39] Respondents indicated that prior to the 1990s, project managers spent most of their time in design activities and relatively little time supervising consultants, because there were few consultants used. When GDOT project managers did supervise consultants, their experience in design gave them the capability and expertise to do so. Today, GDOT project managers are much younger and less experienced than the cadre of senior engineers who are currently retiring. These younger engineers are being pushed into consultant management without the grooming and experience necessary for the work. It is a negative feedback loop in which greater consultant usage demands more consultant managers while providing less design experience for GDOT engineers, and less experienced engineers results in greater reliance on consultants.

Consultant Management Styles and Demands on Management

Two styles of consultant management in GDOT can be observed in these case studies. One style is a hands-off, laissez-faire approach. It is characterized by infrequent communications between the project managers from GDOT and the consulting firms. These communications tend to cluster around benchmarks in project development and are usually informative in nature rather than directive.[40] This style is common in projects

[39] Cases 1, 3, and 5.
[40] Cases 2 (preacquisition consultant), 11, 12.

with consultants who have previous experience with GDOT either as consultants or employees, and particularly when project managers have trust in the consultants' abilities. However, there are also times when GDOT project managers engage in a relaxed form of oversight, reportedly because they have too many projects, leaving little time to spend on each project.[41]

The other style is a hands-on, active management style. It is characterized by frequent communication between the consultant and the GDOT project manager, and it is used in three types of cases. First, active management is used in projects that are complex, unique or had high public visibility.[42] In these cases the communications usually focus on issues of project direction, coordination of stakeholders or interactions with the public. In Case 7, for example, the project manager formed an advisory committee made of stakeholder representatives, required frequent meetings with them and demanded deliverables from both prime and sub-consultants. The GDOT project manager did not find these extra time demands burdensome. Rather, she chose a more active management style for that project because of greater risk and greater reward inherent in its complexity, uniqueness and visibility.

Second, active management is used on projects that involve consultants who are new to GDOT.[43] On these projects the communication usually focuses on administrative issues such as procedures and standards or on issues of GDOT norms. New consultants demand greater active management in order to learn GDOT procedures and norms. In Case 2, for example, a real estate consultant new to GDOT made multiple calls per day to

[41] Case 6.
[42] Cases 7 and 8.
[43] Cases 1, 2 (acquisition consultant), and 4 (while the consulting firm had experience with GDOT, the consultant project manager did not).

the GDOT project manager to get guidance on GDOT norms on property negotiations. However, in contrast to Cases 7 and 8, the GDOT project manager found such management demands burdensome. The project manager was reluctant to spend additional time with the new consultant, because his time was already split among multiple projects, and because he knew he could have contracted an experienced consultant who would have demanded less of his time.

Third, active management is used in projects where there is turnover in GDOT project management during the project.[44] A new GDOT project manager may spend more time with the consultant in order to learn the details of the project, its status and progress, and the decisions made to date. In Case 1, a case with both a new consultant and a new GDOT project manager, the consultant reported spending substantial time briefing the new GDOT project manager on the project and its issues. In that case the GDOT project manager did not find the frequent communication burdensome because he directly benefited from them. However, the extra effort did delay the project and increased its cost.

Changes in Personnel

Changes in GDOT personnel during a project, which is not infrequent, have significant impacts on projects, ranging from delays, to changes in direction or procedures. Delays reflecting the adjustment period in which a new GDOT project manager takes over the project can be minimized through thorough documentation of project progress and decisions.[45] This was suggested by the consultant in Case 1. The consultant felt that had the first project manager documented the decisions and progress,

[44] Cases 1, 5, and 8.
[45] Cases 1 and 5.

the project would have been completed on time and within budget, even with the change in personnel. Instead, it was delayed and cost more than anticipated.

Changes in directions or procedures reflect differences in preferences of project managers.[46] In Case 5, the GDOT managers changed twice. The three project managers had different preferences for the style of the deliverables and different approaches to consultant management. With each change in manager, the project incurred costs and delays due to the learning curves of the new managers and the preferential changes to the project's deliverables.

Effectiveness

Different GDOT offices have had different processes for evaluating the performance of consultants. Also, evidence from the cases shows that GDOT personnel and consultants have overlapping views on the measures and determinants of an effective project.

Evaluation of Consultants

Among the 12 cases, there is variance in the formal, evaluative feedback given to consultants. Six had no formal evaluations given to the consultant[47] and four did.[48, 49] It should be noted that since these 12 projects were executed, GDOT has adopted a policy requiring formal, evaluative feedback to consultants.[50] All firms interviewed in this study agreed that performance evaluations from their clients are highly desirable and help them refine their processes and products.

[46] Cases 1 and 5.
[47] Cases 1, 2, 3, 4, 5, and 6.
[48] Cases 9, 10, 11, and 12.
[49] The two other cases were in progress at the time of the data collection.
[50] A July 2002 memorandum distributed to all office heads and division directors prescribed a quarterly evaluation of all consulting firms, using a 5-point scale on 5 broad, weighted categories: management (25%), prosecution and progress (25%), quality of work (30%), cooperation and coordination (10%), and adequacy and availability of workforce (10%).

The variance in provision and evaluation does not appear to be related to the years the projects were completed in this set of case studies. New and old cases are included in those that had no consultant evaluation. Interestingly, the variance does appear to co-vary with both the type of contract and the GDOT office. The four cases with evaluations were all task-orders, while the six without were not. Project managers of task-orders indicated that they evaluated consultants after each work order in order to improve the consultants' performance during the rest of the contract.[51] The four cases with evaluations were from district offices and the Office of Consultant Design, while the six without were from other offices. Cases 9 and 10 from district offices were CEI projects, and construction offices in GDOT have long evaluated their consultants. Also, Cases 11 and 12 were from the Office of Consultant Design, which focuses on consultant activities and was more active in providing feedback to consultants.

Different offices also use different processes for evaluation, catering to their specific needs. The Office of Maintenance (since Case 6) evaluates its consultants only on technical performance. The Office of Consultant Design has developed a formal evaluation form that grades both technical and administrative performances of their consultants. District offices supervising CEI consultants use yet another evaluation form with 23 criteria specific to CEI work.

Views on Effectiveness

GDOT and consultants have overlapping, but different, ideas about the most important measures of a project's effectiveness and the most important determinants of

[51] The GDOT project manager for Case 9 certainly expressed this motivation for providing feedback to the consultant, but he did not attribute it to the contract type. GDOT recently implemented a formal evaluation process that requires project managers to evaluate consultants for each specific work order under a task-order contract, and for the OCD contract manager's evaluation on the overall project.

project effectiveness. Table 4 summarizes the responses from the case studies. The numbers of cases in the cells do not represent the proportions of GDOT project managers and consultants agreeing with these statements. Rather, the more important observations to make from this table are the ranges of opinions expressed and where opinions overlap or diverge.

When the participants in these case studies were asked what they thought were the most important measures of effectiveness or success in their respective projects, GDOT project managers and consultants agreed that the quality of the output was very important. GDOT project managers were interested in receiving from the consultants error-free products that would be accepted by the public. Error-free designs were also important to the consultants. They measured the quality of their designs by the number

*Table 5: GDOT's and consultant's measures and determinants of effectiveness**

	GDOT	Consultant
Measures of Effectiveness		
High quality output	3, 4, 6, 7	1, 2, 4, 5, 6, 7, 9, 11
Project completed on schedule	3, 4, 6, 7, 8	2, 3, 6, 7, 12
Consultant awarded subsequent contracts	1	1, 2, 4, 9, 10, 12
Consultant requires minimal guidance	2, 6, 9	
Project completed within budget	8	4
Consultant desires to learn and advance career	9	
Project is profitable		2
Consultant gains positive reputation with GDOT		1
Determinants of Effectiveness		
Technical competence of the consultant	2, 4, 5, 8, 10	
Communications/coordination between GDOT and consultant	3, 5	2, 5, 10
Consultant's responsiveness to GDOT demands		5, 8, 9, 11
Long term relationship between GDOT and consultant	9	2, 5, 10
Consultant's understanding of GDOT/government procedures	3, 5, 10	2, 5
Continuity of preconstruction tasks, work flow control		1, 3, 12
Relevant experience/training of consultant		2, 10
Consultant's local knowledge		9

* Numbers in the table are the cases in which the GDOT or consultant interviewees expressed the opinions listed on the left.

of constructability issues and change orders brought up during construction. Both GDOT project managers and consultants also identified the completion of the project on schedule and within budget and the subsequent award of additional contracts to the consultant as good measures of an effective project.

In three cases GDOT project managers listed managerial burden as a measure of effectiveness. These managers based their satisfaction in their consultant projects on how much active management it demanded. Case 2 provided a quasi-experimental example of this behavior. Two consultants were hired for that project; one consultant was a former GDOT employee with vast GDOT consulting experience, while the other had neither previous GDOT contracts nor previous GDOT employment. The former required little effort from the GDOT project manager because the consultant was familiar with GDOT expectations and processes. The latter required multiple discussions per-day and much guidance. Although the GDOT project manager in this case admitted that both produced exceptional output, the process for the former was easy while that for the latter was arduous and demanding. For this reason the GDOT project manager was dissatisfied with the latter.

When asked what they thought were the most important determinants of effectiveness, GDOT project managers and consultants again provided similar responses. Individuals from both groups agreed that a long-term working relationship was an important factor, as well as good communication and coordination. Both also agreed that consultants need to have a solid understanding of GDOT and government policies and procedures to be effective. GDOT project managers also placed importance on the technical competency of the consultant. Similarly, two consultants listed experience and

training as important determinants. Other factors listed by consultants, but not by GDOT project managers, included the consultant's responsiveness to GDOT demands and local knowledge of the project area.

Interestingly, the seven determinants of effectiveness listed in Table 4 can be categorized into two of the independent variables illustrated in Figure 1. The technical competence of the consultant, their long-term relationship with GDOT and their local knowledge are preconditions of a project. The communication and coordination between GDOT and the consultant and the consultant's responsiveness to GDOT are elements of the implementation phase. The consultant's understanding of GDOT procedures and relevant training could be preconditions or elements of implementation. None of the seven determinants of effectiveness fit under the contracting phase, suggesting that GDOT project managers and consultants think that the procurement process itself has little *direct* bearing on a project's success.

Exogenous Variables Affecting Consultant Management

The case studies reveal two factors outside of the formal consultant management process that GDOT personnel perceive as affecting different phases of the process: the volume of projects processed by them and the demographic dynamics of GDOT staff.

Volume of Work

The high volume of work carried by some GDOT project managers partly explains why they favor contracting firms that have former GDOT employees in their ranks or have previous contracting experience with GDOT.[52] Such firms reduce managerial demand on the project managers, because they are intimately familiar with

[52] Cases 2, 3, 4, 5, 6, 9, and 10.

GDOT policies, procedures and norms, and because the GDOT project managers have learned to place trust in them. The GDOT project manager for Case 6, for example, explained that he can only spend a limited amount of time on each of the projects he manages, because he has so many. The use of a consultant new to GDOT on any of those projects would require him to spend more time on those projects and less on others, or it would require him to carry fewer projects. On the other hand, contracting consultants with GDOT experience allows him to take a more hands-off approach to management, because he can trust the consultants' knowledge and abilities.

Demographic Dynamics

Interviews conducted for four of the cases revealed that the demographic dynamics of GDOT engineers and inspectors affects consultant management, especially the contracting and implementation phases. According to GDOT managers interviewed for these cases, GDOT is experiencing the retirement of a cadre of senior technical staff, and the replacements are much younger and relatively new to the department.[53] This transition can be problematic when consultant projects are involved. The younger engineers lack sufficient experience in design, construction and management to successfully manage a consultant contract,[54] and consultants sometimes find it difficult to be supervised by GDOT engineers who are younger and less experienced.[55] In this way, the demographic dynamics of GDOT staff affects the implementation phase of consultant management.

It also affects the contracting phase. To address this problem of younger, less experienced engineers replacing a cadre of retiring engineers, some GDOT project

[53] Cases 3, 6 and 9.
[54] Case 9.
[55] Cases 3 and 10.

managers have actively sought the contracting of firms with retired GDOT employees.[56] This strategy provides two significant benefits. First, it brings to the projects engineers with much GDOT experience and thus provides some level of assurance that the project will be successfully completed. Second, it provides a mechanism through which the retired GDOT engineers can work with the younger, less experienced GDOT engineers and help train them in project management. In Case 9, for example, the training of young GDOT engineers was explicitly stated as a rational for contracting a consulting firm with retired GDOT employees.

Conclusion

This study sought the determinants of consultant management effectiveness through 12 cases representing different GDOT offices and different times. Its most fundamental conclusion is that there has been much variance in the processes of consultant management in GDOT. The differences co-varied with time, with individual GDOT project managers and with the projects. Furthermore, variance appears in each phase of consultant management. The differences appear strongest in preconditions (especially the effects of a firm's size and experience with GDOT), contracting (especially consultant selection) and implementation (the management styles employed). However, in some processes the variation has diminished due to active steps taken by GDOT. The variation in consultant performance evaluation reported in the cases, for example, is currently being attenuated by a new policy and guidelines for evaluations by OCD.

[56] Cases 9 and 10.

While there is variance in these cases' processes, there is much similarity among the GDOT project managers. As a group they have a strong focus on efficiency, usually measured as getting a quality output quickly with minimal effort. (This is best reflected in the individual case summaries in Appendix B). By this measure they are quite successful, and this is a strength of GDOT consultant management. However, speed of implementation sometimes comes with costs of its own. Those highlighted in this report are the competition among consulting firms and the expansion of the pool of consultants. Other areas for improvement include the division of tasks between GDOT and the consultant, the assignment of contract administration responsibilities and the transfer of knowledge when personnel turn over.

SECTION III: CASE STUDIES

Summary of Case Study Format

Each of the following twelve case studies presents key project features in brief, and in narrative form describes and assesses the project's history, implementation, and outcome. Throughout, the cases offer analysis of the GDOT's consultant management processes.

Case study titles consist of a case number and a GDOT office. Case numbers were assigned arbitrarily and were used primarily to simplify the cross-scale analysis throughout Section II. The GDOT office identifies the contracting office of the investigated case.

Each case study is divided into four sections: Case Summary, Evidence from the Logic Model, Causal Links, and Lessons Learned. The Case Summary provides a summation of the project's office or departmental context, the consultant's Scope of Work, the selection process, the contract award amount and type, and traces chronologically major project events.

The second section, Evidence from the Logic Model, assess for each case the four major variables from the logic model: Preconditions, Contracting, Implementation, and Evaluations/Outcomes. This section offers project details in analytic narrative and is designed to tell the consultant management story as perceived by GDOT and consultant participants and as revealed through archival evidence. The bulk of the Cross-Scale Analysis in Section II of this report was derived from the happenings discussed in the Evidence from the Logic Model section of these cases.

The final two sections, Causal Links and Lessons Learned, provide the summary points and major analytical findings of each case as perceived by the researchers. The Causal Links section offers an assessment of important causal relations in the project/consultant management process. Causal Links are descriptive in nature rather than prescriptive and do not offer recommendations for action. The Lessons Learned section offers more normative analysis in surmising the consultant management story with recommendations and reflections on how GDOT may improve their process.

CASE STUDY 1: THE OFFICE OF ROADWAY DESIGN

Case Summary

Project: This case study focuses on a project that was part of a larger effort to widen, reconstruct, and extend SR 72 from US 29/SR 8 north of Athens easterly 9.4 miles to SR 172 in Madison County. The project was divided into three segments. Different consultants were contracted to design each segment. The segment upon which this study is founded covered 1.8 miles between CR 392 in Colbert and SR 172, which ran parallel to the Seaboard System Railroad. The existing two-lane undivided road was to be widened to a four-lane, divided road. The portion of the road within the city limits of Colbert was to be upgraded to an urban section with a raised median, curb and gutter. The remaining portion of the road was to be completed with a raised median, paved shoulders and rural ditch section.

Consultant's Scope of Work: At the time of this project, GDOT tended to contract only the design and survey tasks of preconstruction. Other tasks (e.g., right-of-way acquisition, environmental assessment) were done in-house. This consultant was contracted to perform the following design related tasks: concept verification, database update and verification, construction plans development, right-of-way plan development, and right of way staking. The consultant, in turn, sub-contracted traffic analysis, aerial mapping and land surveying to three other firms.

Selection Process: Competitive, qualifications-based selection.

Amount of Contract: This contract was for $236,862.

Contract Type: Cost-plus-fixed fee, with a cap.

Timeline:

07 1993:	Consultant submits responses to questionnaire and Statement of Qualifications. GDOT selects the consultant and asks for a cost proposal.
10 1993:	Consultant submits cost proposal.
11 1993:	Consultant submits a revised cost proposal.
12 1993:	Consultant submits a second revised cost proposal.
01 1994:	GDOT completes pre-award audit.
04 1994:	GDOT and consultant sign the contract, and GDOT organizes and advertises a public information meeting.
05 1994:	GDOT holds public information meeting. GDOT issues notice to proceed for Phase One (Preliminary Plans), and holds kick-off meeting the same day.
05 1994:	Consultant begins evaluation of project concept.
06 1994:	Consultant delivers revised concept report.
01 1995:	Consultant submits preliminary plans.
03 1995:	GDOT and Consultant attend preliminary field plan review meeting.
04 1995:	GDOT issues notice to proceed for Phase Two (Right of Way Plans).
09 1995	First invoice including Phase Three (Right of Way Staking, Updating Right of Way Plans, and Construction Plans) submitted
04 1996:	Consultant completes GEPA Environmental Effects Report.
07 1996:	Consultant submits final plans minus utility plans.
02 1998:	Consultant delivers final plan review.
09 1998:	Final Cost Audit Report Submitted
12 1998:	GDOT submits revised final cost audit.

Evidence from the Logic Model

Preconditions

GDOT's use of consultants was minimal and usually limited to supplemental labor (e.g., drafting) that was directly supervised by GDOT project engineers until the early 1990's. Such "consultants" were typically procured through a low-bid selection process. In contrast, this case is an example of GDOT's early use of consultants in the prominent role they currently hold in GDOT: to manage and deliver entire design projects. It also marks GDOT's transition to a qualification-based selection process for consultant procurement.

A GDOT project review committee of four or five members, which included Division Directors, assigned this project to the Office of Roadway Design.[57] The office's request to use a consultant for this project was approved by the Division Director.

An engineer from the Office of Roadway Design was assigned to be the GDOT project manager, the first of two managers who supervised the project until completion. The consultant firm contracted was new to GDOT. The firm had competed for previous GDOT projects and had been short-listed for one, but this was their first GDOT contract. They are a small local firm of twelve employees. The firm actively sought projects from GDOT and viewed the department as a potential source of projects that would help them grow. They did not have previous connections with GDOT, and unlike other consultants working with GDOT, no one in this firm had worked for GDOT previously.

Contracting

Three GDOT offices were involved with this project, the Office of Right-of-Way, the Office of Environment and Location, and the Office of Roadway Design. Each office was asked if it wanted its project contracted or done in-house. For each office, its schedule of projects, work load, and available labor dictated whether or not it desired this work to be done in-house. Ultimately, only the design tasks were contracted to consultants. The other preconstruction activities were done in-house by GDOT.

The Office of Roadway Design then mailed requests for letters of interest to pre-qualified firms. The consultant for this project received such a letter, which was their first knowledge of the project. They responded to GDOT with a letter of interest and a completed questionnaire, followed by a Statement of Qualifications. The firm was short-

[57] At this time the Office of Consultant Design did not exist.

listed and sent a Request for Technical Proposal by the assistant head of the Office of Roadway Design, who collected the proposals from firms and participated in the selection and negotiations.

At the time of this project, every office ran its own consultants selection process.[58] In the Office of Roadway Design, evaluation of the competing consultants was done with ten scored criteria, which included technical qualifications, software, schedule, labor, locality, etc. The GDOT project manager and his team leader scored all the proposals. For consultants new to GDOT, supplemental research was done. Their qualifications and abilities were more carefully scrutinized, and their references were checked. For firms experienced with GDOT, reputation went a long way in the evaluations. The consultant that was ultimately selected submitted a strong technical proposal, but they were a small firm, unknown to GDOT. As a result, GDOT was reluctant to award them a large first project. To accommodate, GDOT decided to assign the firm a 1.8 mile piece of the overall project. The SR 72 project was originally divided into two projects, but GDOT divided it into three in order to award a smaller project to this firm.

Implementation

GDOT first assigned a project manager who was an engineer from the Office of Roadway Design who managed this project to about 80% completion, and then left GDOT. A second engineer was given responsibility for this project and managed through

[58] Today, the Office of Consultant Design consolidates the selection process for all design offices (with rare exceptions). The Office of Bridge Design still has a separate process. OCD assembles a cross-office team representing the tasks to be contracted out to evaluate the proposals.

completion of the design.[59] The consultant project manager was a senior design engineer in the firm. She did the roadway design herself, and supervised supporting technical efforts. Although there were three sub-consultants, the consultant project manager remained the primary point of contact for GDOT.

Regular communications for this project were necessarily frequent for three reasons. First, the consultant was new to GDOT. The consultant project manager explained that her firm felt that this project would set their reputation with GDOT and determine whether they would win future projects, so they had to deliver their best. This required clear and frequent communications with GDOT. The GDOT project manager did not mind the frequency of communications, due in part to the fact that he was new to consultant management, so he too wanted the frequent communications to keep on top of the project. Second, the two adjacent projects developing simultaneously also made frequent communications necessary. The three projects were being designed simultaneously by different consultants with different GDOT project managers, making coordination among them key to the success of the overall highway improvement. This did not always go smoothly, and at times it delayed progress because clear lines of communication were not established. The consultant and GDOT project managers had differing ideas on how coordination between the projects would interface. The GDOT project manager considered it the consultant's responsibility to coordinate with the consultants on the other sections of the road, while the consultant thought GDOT was coordinating communication between the projects. Third, the change in the GDOT project manager demanded more communication and coordination. It took some time for

[59] All further references to the GDOT project manager for this case study pertain to the second project manager.

the new project manager to familiarize himself with the project enough to manage and direct it. The consultant spent much effort helping the GDOT project manager become familiar. Thorough documentation of decisions and progress could have facilitated the managerial transition, but the first GDOT project manager had not maintained such records.

According to consultant representatives, management of this project was also made difficult by the apparent lack of coordination between GDOT offices. An example of this was the revisions of the signage and pavement marking plans. The consultant used published standards to guide the development of these plans. After an initial review by GDOT, the consultant received marked-up plans from the GDOT project manager requesting major changes. The consultant made the changes as requested and resubmitted the plans. Several months later, they received their plans back, this time marked-up by the District Office. The majority of the changes requested were identical to the consultant's original designs. The consultant found this process frustrating because of the inconsistent directions and because they did not budget for such a large number of design changes.[60] The consultant also saw a lack of coordination between the design offices and the Office of Audits. It seemed to the consultant that the Office of Audits operates on schedules independent of the design process, both before and after contract execution.

Coordination was also made difficult by the division of preconstruction tasks between GDOT and the consultant. The consultant was tasked primarily with roadway design, while GDOT chose to do the environmental and acquisition work themselves.

[60] Today, TOPPS and MOG have made the standards more consistent and accessible.

The separation of the environmental work and design work between GDOT and the consultant became a problem when the consultant needed input from the environmental assessment in order to proceed with designs. The Office of Environment and Location had not yet completed the work, which delayed the consultant's efforts. The consultant would have preferred to include the environmental assessment in their contract in order to have control of the work flow.

Monitoring of the project's process occurred through scheduled deliverables and monthly invoices. These regular, planned checks on project progress constituted approximately 40% of the project managers' monitoring. The other 60% occurred when managing the project through specific problems such as financing, right of way, coordination, etc. The consultant wanted more frequent feedback, so, on their own initiative, they submitted several intermediary plans to GDOT for informal review (e.g., vertical and horizontal alignments, cross-sections). The GDOT project manager was responsive to this initiative, which helped the new consultant assure they would produce an acceptable product.

Subsequent to completion of contracted work, GDOT wanted additional, out-of-scope changes made to the design. The consultant had been compensated for the extra hours expended to assist the new GDOT project manager and for the additional iterations of plan revisions. However, a consultant representative felt the extra money spent on these tasks could have been used instead in a supplemental agreement in which the consultant could have performed the additional work GDOT wanted accomplished. Instead, GDOT made the revisions in-house. The consultant presumes that this was frustrating for the GDOT engineer charged with taking someone else's work and database

and making changes to them. It was also an inefficient way of making the changes. This matter was viewed as a disappointment to the consultant as the consultant felt responsible for the project and the quality of the final plans, which was now, to a certain extent, not under the consultant's control.

Evaluation/Outcomes

From a business perspective, the consultant views their ultimate measure of effectiveness as their award of subsequent, larger, and more complex projects. By this measure they were effective. They have been awarded three subsequent projects that are larger and more complex than this one. Furthermore, they are building a positive reputation within GDOT. They did not however, receive a formal evaluation of their work on this project and were not given feedback on how they could make improvements. At the time, only informal, word-of-mouth evaluations of consultants were shared within GDOT.[61]

Technically, the consultant normally measures their effectiveness by the constructability of their designs. Typically, the number of issues that arise during construction due to the consultant's work and the number of change orders that result from them are good measures of the quality of the designs. This consultant participates in the construction phase of the project with most clients, and thus gets such feedback. They do not provide services during the construction phase with GDOT, and thus do not get a measure of their technical effectiveness. The consultant would prefer to participate in the construction phase, not only for the extra work, but also to improve their own

[61] Today, a new, formal evaluation process is used to inform other GDOT staff on consultants' performances and to give the consultants feedback to improve their work.

design processes and products. The GDOT project manager noted that the consultant answered several questions during construction of the project at no cost to GDOT.

The consultant project manager's one disappointment in working with GDOT is that this initial contract has not led to a substantial increase in future contracts, and has not fulfilled the firm's expectation that GDOT contracts would help grow and diversify the firm. The consultant attributed this phenomenon to GDOT's policy – perhaps an informal one – that prevents this small firm from getting multiple projects simultaneously. GDOT has not awarded this firm more than one project at a time. The consultant views this as a problem, because they could use multiple projects to keep specialized skills consistently employed and to enhance their working portfolio. The consultant recognized that work flow issues are more easily managed with more projects, not less. However, GDOT's perspective is that this firm has done exceptionally well in the number of contracts it has been awarded by GDOT, considering the size of the firm and the high level of competition in the consulting market.

Causal Links

The division of a single project between multiple consultants under multiple project manager supervision complicated coordination, caused production delays, and complicated management. GDOT selected a firm that was unknown to them. To minimize risks associated with an unknown consultant and to spread the work around, GDOT chose to reduce the amount of work awarded to any one consultant by dividing the larger project into smaller projects. GDOT awarded one of those parts to this consultant. This had the positive effect of enlarging the pool of consultants working with GDOT, which can also increase competition among them. However, the division of this

project into smaller, adjacent parts demanded greater coordination among the three GDOT project managers and three design consultants. This demand was not always met on this project, as both consultant and GDOT thought the other was coordinating with their counterparts on the adjacent parts. The lack of specified lines of communication caused some confusion and delays in the project. Also one of the adjacent segment projects was on a design schedule that was behind the subject project; this contributed to the negative impact of dividing a single project into multiple projects.

Work flow problems were caused by contracting only a portion of preconstruction tasks while others were performed in-house. During project programming, each preconstruction office involved with this project was asked whether they wanted their tasks included in a consultant contract. Only the Design Office did, so the consultant was tasked with design tasks, while the right-of-way and environmental tasks were done by GDOT. Dividing preconstruction tasks between GDOT and the consultant later had an impact on project flow. At one point during the contract, the consultant needed information from the environmental assessment in order to proceed with designs. However, the Office of Environment and Location had not yet completed their assessment, and therefore progress was slowed on the designs. In more recent projects, GDOT has more often contracted out all preconstruction tasks for a project. This gives the consultant greater control of work flow, as well as a larger scope of work. At the same time it allows GDOT to hold the consultant more responsible for the pace of the project.

A change in GDOT personnel delayed the project. The GDOT project manager changed during the contract, and the change illuminated a weakness in consultant management.

The change initiated a slow down of the project, during which the new project manager familiarized himself with the project and the consultant. The consultant also spent time to help the new project manager understand the details of the project. Such a change in key personnel is expected to delay a project to a certain extent, but the delay in this project was exacerbated by GDOT's lack of thorough and systematic documentation of the project's progress and decisions by the first project manager. This lack of documentation caused the new project manager to rely heavily on the consultant's records instead of GDOT's.

GDOT's reluctance to give multiple projects limits a small firm's ability to grow. This firm sought a contract with GDOT because it saw GDOT as a source of steady and high volume work with which they could grow their company. This has not happened, however, not because of the consultant's performance on this project, but because GDOT is reluctant to give small firms more than one project at a time. Thus, there is a reinforcing circle of effects where a small firm cannot grow because it is unlikely to get multiple projects from GDOT, and GDOT has been hesitant to award multiple projects to a firm because it is small. Compounding the problem for the consultant is the difficulty of managing their staff with a small portfolio. It is difficult to provide continuous work for highly-specialized skills with a small portfolio of projects. As a result, the firm and its employees often experience "downtime" when there is little work to be done, or they are waiting on a decision from the client on a project. The firm is therefore unable to efficiently use its consultant staff. Firms with larger portfolios are able to move personnel from project to project (and often from state to state) based upon the skills needed at different phases.

Lessons Learned

Performance evaluations, regardless of form, should be shared with the consultant. Evaluation of the consultant was informal and kept within GDOT. When the consultant competed for subsequent projects, the project manager for this contract shared positive, anecdotal assessments of the consultant's abilities with reviewers for the other projects. This ultimately led to more projects for this consultant. While the consultant was happy with this and the reputation they built with GDOT during this first project, they never received feedback from GDOT on their work and thus missed an opportunity to improve their design processes. The consultant normally gets feedback on their design during the construction phase from their other clients. Their other contracts include services during construction that allow them to monitor the number of change orders, a good measure of the quality of designs. The consultant never learned how their products could be improved for future GDOT projects due to the lack of formal evaluation.

CASE STUDY 2: THE OFFICE OF RIGHT-OF-WAY

Case Summary

Project: This case study focuses on a GDOT project to improve the entrance to Fort Valley State University on University Boulevard / State Route 894, in Peach County. GDOT planned to build a new connector road between two existing roads near the college. As usual with roadway design projects, this project required the Office of Right-of-Way to procure the property necessary to build and maintain the new facilities. There were nineteen properties affected by this project.

Consultant's Scope of Work: Two consultants were contracted for the Office of Right-of-Way's tasks: one consultant oversaw the appraisal of the affected properties and brought each parcel to the point of negotiation, another consultant acquired the properties from their owners. The appraisal consultant was contracted to perform the "pre-acquisition" tasks, which generally included hiring appraisers, coordinating surveys of the property lines, and working with the GDOT- appointed attorney to prepare title certificates. The acquisition consultant was contracted to perform the acquisition tasks, which generally consisted of negotiating acquisition with each property owner and certifying all acquisitions. If the negotiation process failed for any property, then the consultant would initiate condemnation proceedings.

Selection Process: Non-competitive, direct solicitation of the two consultants.

Amount of Contract: The pre-acquisition contract was for $50,000. The acquisition contract was for $20,000.

Contract Type: Pre-acquisition consultant: the contract was for time and materials, with a cap. Acquisition consultant: the contract was for a lump-sum amount, per property.

Timeline:

09 1997: GDOT put out a Request for Proposals for real estate appraisal.
01 1998: GDOT grants first authorization of funds for right-of-way acquisition.
02 2000: GDOT selects the pre-acquisition consultant. The contract is signed without a date.
03 2000: GDOT issues a notice to proceed to the pre-acquisition consultant.
04 2000: GDOT grants second authorization of funds for right-of-way acquisition.
09 2000: GDOT selects the acquisition consultant. The contract is signed without a date.
10 2000: GDOT issues a notice to proceed to the acquisition consultant.
12 2000: GDOT makes a last payment to the pre-acquisition consultant.
08 2001: GDOT makes a last payment to the acquisition consultant.
12 2001: GDOT receives certification of right-of-way acquisition.

Evidence from the Logic Model

Preconditions

The consultant contracted to appraise the property has a long history with GDOT. He is a former GDOT employee who retired after twenty-five years of service. This former employee expressed he had no intention of working as a consultant after retirement, but after an initial contract with another agency he decided to form a family firm and begin a second career in consulting for GDOT. Today, his consultant firm remains a small, family business with just three employees.

In sharp contrast, the consultant contracted to acquire the property had limited experience with GDOT, and none as a GDOT employee. The consultant had worked with several GDOT managers in her previous career with the Atlanta office of the Federal Highway Administration, and these contacts helped her receive her first consultant project with GDOT. The differences in GDOT experience between these two consultants would influence the scopes of work, their working relationships with the GDOT project manager, and the GDOT project manager's satisfaction with their work.

Contracting

GDOT headquarters, when deciding to use a consultant for right-of-way acquisition, typically contacts the District Office that will oversee the project to ask for their preference on whether or not to use outside help. District offices frequently ask for consultant help in order to lessen their responsibilities in the project, and thereby transfer responsibilities to a right-of-way official from headquarters. This was the case in this project. The District Office requested the use of consultants to acquire the right-of-way, so GDOT headquarters assigned the project to a project manager from headquarters' Office of Right-of-Way.

GDOT's Office of Right-of-Way typically assigns appraisal and acquisition work to one consultant. However, in this case, the work was divided between two consultants. While a formal request for proposals was published for this right-of-way work, these two consultants were directly asked by GDOT to take this project. The appraisal consultant was asked first. The State Right-of-Way Engineer knew him from his employment with GDOT and was confident in his work. The consultant agreed to perform the "pre-acquisition" work (i.e., appraisals and title work), but not the acquisition work. He preferred the pre-acquisition work because it is more lucrative and challenging. The State Right-of-Way Engineer agreed to contract him for the pre-acquisition work only and decided to solicit a new consultant – his former contact at the Federal Highway Administration – for the acquisition work. She agreed.

The GDOT project manager for this project prefers that right-of-way projects go to the best qualified available consultants, and not to the lowest bidder of a competitive process. He feels real estate consultants' skills and abilities should be classified and

rated, and GDOT projects should be assigned based on the best match of skills and ability with the needs of projects. One of the consultants agreed, saying that low-bid competitive processes have in the past resulted in consultants who are inexperienced in right-of-way work, which in turn led to problems for GDOT. The problems are accentuated in large projects.

The pre-acquisition consultant for this project supervised real estate appraisers contracted by GDOT. GDOT maintains a list of approved appraisers that are ranked on a scale of one-to-five on their ability to appraise property value. The appraisal consultant reviewed the scope of the project and assessed the level of difficulty for appraising each affected property. The consultant then sought appraisers whose rated skills matched the level of difficulty of the properties. The appraisal consultant feels that the Office of Right-of-Way should have a similar process for selecting consultants – one that matches the abilities of the consultants with the levels of difficulty of the projects, based upon previous performances rated by GDOT project managers.

Implementation

Three key people were involved in this project. The GDOT project manager had been a team leader in a District Office before transferring to headquarters' Office of Right-of-Way, and was GDOT's point of contact for this project. The appraisal consultant did most of the tasks himself, with administrative assistance from two staff members. The acquisition consultant did all tasks herself, as she is a one-person firm. A GDOT- appointed attorney also worked on the project through both phases.

The Office of Right-of-Way has procedure manuals for appraisals, negotiations, and relocations, but does not offer formal training to new consultants working for them.

Experience working with GDOT is the only way to really learn what is necessary to successfully perform as a consultant for the DOT. As a former GDOT employee, the appraisal consultant for this project had GDOT experience and required no training, but the acquisition consultant did not have experience with GDOT and required more attention from the GDOT project manager; this project presents an interesting comparison of managing new and experienced consultants.

The communications between the GDOT project manager and the two consultants reflected the differences in GDOT experience between the two consultants. The pre-acquisition consultant called the GDOT project manager about one to three times per week, and the calls were usually informative in nature to let the project manager know the progress of the appraisals. The pre-acquisition consultant tried to make decisions on his own, and relieve that burden from the project manager. Even when there were design problems, the consultant worked directly with the designer instead of through his GDOT project manager. The GDOT project manager was comfortable with this situation. He felt that the appraisal consultant had a good understanding of GDOT goals and procedures, thus their communications were relatively infrequent and non-problematic. The consultant felt that this level of trust between him and the GDOT project manager was a direct result of his former employment and work with GDOT.

The relationship with the acquisition consultant was different. At the beginning of her work, she called the GDOT project manager a few times per-week. But as the parcels progressed in the negotiations, she called the GDOT project manager frequently, sometimes several times per-day. These calls were frequently to ask for guidance on actions and procedures. This bothered the GDOT project manager considerably because

he felt the consultant was contracted to make decisions on her own and not to always defer to him. The acquisition consultant, on the other hand, wanted to get a feel for GDOT decision-making norms before making decisions herself. The types of questions the consultant asked dealt with strategies of negotiation, limits of counter offers, special requests of individual property owners, etc. In retrospect, the GDOT project manager judged this amount of contact and guidance as too much "hand-holding". Ironically, the consultant reflected on these communications and called it a strength of GDOT and the project manager. She felt the open communication was very helpful, and knowing that GDOT is willing to work with their consultants is a credit to them.

The two consultants' work did overlap, and they did communicate a few times but not often. Their work was most often in a serial process from appraisal to acquisition.

Evaluation/Outcomes

The GDOT project manager and the consultants had overlapping opinions on the measures of consultant effectiveness in right-of-way acquisition. To the project manager, the most important quality of an effective consultant is knowledge of the property acquisition process. Such a consultant needs little guidance and can make decisions authoritatively. The project manager considered performance important. He acknowledged that these tasks are not difficult, but being able to perform them with little guidance and in a timely manner is special.

The pre-acquisition consultant feels that the most important measures of his effectiveness are good communication with the project manager and completion of tasks within the allotted time. The acquisition consultant has a more business-focused opinion on the measure of consultant effectiveness. Ultimately, she feels she is effective if she

makes a profit on the project. She is paid per-acquisition, not per-hour. So appeals, property condemnations, and other things that lengthen acquisitions are costly to her as a consultant because it takes time away from other work she could be doing. According to this measure, she feels she is a good consultant.

There were no formal or informal evaluations of the consultants' performances on this project, but all parties agree that there should be, and if constructed and properly implemented, they could be quite helpful for both GDOT and the consultants. The pre-acquisition consultant added that evaluations should not simply rate consultants on a scale from bad to good, but should note the types of projects best suited for them given the specialized skills and knowledge they possess.

Both consultants were satisfied with the outcomes of their work on this project, and both have been awarded subsequent GDOT contracts. The ultimate outcome of this right-of-way project was the successful acquisition of all required property for the construction and maintenance of the roadway project. The consultants' activities leading to this outcome were also positive. The acquisition consultant acquired 19 properties, 15 by deed, 2 by condemnation (one of them was a "friendly condemnation" in which there were questions about the ownership of the land), and 2 were drive easements. Collectively, they were all acquired within GDOT's financial goals. On December 5, 2001, the acquisition consultant certified the acquisition of all the required properties.

The acquisition consultant attributed part of her success, in negotiating settlements with property owners, to the work of the appraisal consultant. She found the appraisal work to be very good. Only two offers were appealed, and though appeals are

not necessarily an indication of poor appraisals, the lack of appeals certainly indicated acceptable appraisals to the property owners.

The consultants had suggestions on how GDOT might better manage right-of-way consultants and streamline design processes. Their suggestions included formal orientation for consultants new to GDOT, proactive recruitment of certified appraisers, and retaining design consultants through the entire pre-construction process.

Causal Links

Splitting pre-acquisition and acquisition tasks had mixed results. Usually, the Office-of-Right of Way assigns both pre-acquisition and acquisition work to one consultant. The GDOT project manager for this project prefers this approach because only then does the person negotiating acquisitions have the complete knowledge of the properties that the appraiser has. For this project, an exception was made in order to get the preferred pre-acquisition consultant. Both consultants disagreed with the project manager on this point and think that the separation of pre-acquisition and acquisition work is a better approach. The appraisal consultant finds the two tasks to be too different in required skills and level of difficulty to have one person do it effectively and efficiently. The acquisition consultant feels combining the tasks would lengthen the work beyond the interest of one consultant.

Previous GDOT experience affected working relationship, but not outcome. The difference in GDOT experience between the two consultants was reflected in their working relationships with the project manager. On one hand, the pre-acquisition consultant worked relatively independently and had regular but limited communications with GDOT project manager. The nature of these communications was usually only

informative. The consultant felt quite comfortable making project decisions, on behalf of GDOT, and the project manager felt comfortable with the consultant's judgments. Both agreed that the consultant's history and experience with GDOT helped establish this level of trust. On the other hand, the acquisition consultant, in a concerted effort to learn GDOT norms in the acquisition process, leaned heavily on the guidance of the GDOT project manager. She called and emailed the project manager multiple times daily and deferred settlement decisions to the project manager. While the project manager understood the need to "train" new consultants and the effort required to do so, he found this working relationship very burdensome. He felt the demands of the acquisition consultant disproportionately dominated his time and took time away from the many other projects he was managing.

Lessons Learned

The contrasting working relationships with these two consultants formed the basis of the project manager's satisfaction and overshadowed the positive outcomes of their work. Indeed, the outcomes were good. All the properties were acquired within GDOT's allotted budget. Furthermore, they were acquired with minimal problems. There was only one contentious condemnation. These results are indicative of both favorable appraisals and skilled negotiations. Nonetheless, the project manager was not pleased with the acquisition consultant because of the "hand-holding" that was needed. He favored the hands-off working relationship and level of trust he had with the pre-acquisition consultant. As a manager of consultants, especially consultants new to GDOT, some guidance should be expected.

CASE STUDY 3: THE OFFICE OF URBAN DESIGN

Case Summary

Project: This case study focuses on a project of two pieces of a larger corridor improvement in the City of Alpharetta. The purpose of the project was to provide better western access to Georgia 400 through Alpharetta. Specifically, this project extended Maddox Street west of SR 9 to SR 120 and ultimately to GA 400. This project dealt with the part from Haynes Bridge Road west to Wills Park, roughly 0.9 miles. The extension was a four-lane project with a raised medium, connecting to the existing six-lane raised-medium section of SR 120 to GA 400.

Consultant's Scope of Work: The consultant was contracted by the City of Alpharetta to do all pre-construction work on this project. This included concept development, design, environmental assessment, right-of-way acquisition on behalf of the city (with state funds), and public hearings. GDOT provided the technical supervision on the project, and the consultant was required to follow GDOT procedures and standards, such as the PDP.

Selection Process: Non-competitive selection. The consultant requested this design project be added to their ongoing contract with the City of Alpharetta, and the city agreed.

Amount of Contract: Unknown.

Contract Type: Local Government Project Agreement. This project was a supplemental agreement to an ongoing contract the consultant had with the City of Alpharetta to manage the city's roadway development program.

Timeline: This supplemental was issued in 1991. The design was let for construction in 1994.

Evidence from the Logic Model

Preconditions

The consultant was contracted by the City of Alpharetta, not GDOT, to design this project. However, GDOT managed the design. GDOT's Office of Urban Design provided the technical expertise and acted on the city's behalf with the consultant, while the City of Alpharetta provided contract administration.

The lead individuals from each of the three parties shared close professional relationships. Each of them had been employed by GDOT at some point in their careers, and the GDOT project manager considered the other two as extensions of GDOT staff rather than contracted help. Furthermore, the consultant project manager and the Alpharetta roadway program manager were employed by the same consulting firm. These close relationships facilitated the management and flow of the project.

Contracting

In a Local Government Project Agreement (LGPA), the City of Alpharetta agreed to provide all pre-construction services while GDOT provided technical supervision. The City of Alpharetta, in turn, contracted a consultant to do the pre-construction tasks. The consultant selected was one the city already had contracted to supervise their roadway infrastructure program. They simply negotiated an expansion of their contract to include this project.

Implementation

Communications between the consultant, GDOT, and the City of Alpharetta were mostly limited to the three lead individuals, and were open among them. The openness certainly was facilitated by the GDOT employment they had shared, and the employment of the Alpharetta project manager by the consulting firm. With these relationships, the consultant felt comfortable working directly with GDOT on technical issues, instead of going through the city with whom he was formally contracted. Even so, when the consultant had formal communications with GDOT, he would send a copy to the city to keep them informed.

While the three parties agreed to streamline communications directly between GDOT and the consultant, the arrangement did present a problem for the consultant. When the GDOT project manager wanted something in the project changed, he would directly contact the consultant to look into it. However, unless he informed the city of the request, the consultant was not paid for that effort. To avoid this problem, the consultant needed to ask the City of Alpharetta to authorize extra work.

Staff working under the consultant project manager and the GDOT project manager also communicated directly with each other on daily technical issues. For example, right-of-way and environmental staff in the consulting firm communicated directly with their counterparts in GDOT instead of going through the respective project managers. All formal decisions and submittals on any aspect of the project did go through formal channels.

The frequency of communication varied with the milestones and problems encountered in the project. The mode of communications at that time (i.e., the early 1990s) was mostly telephone calls, and the consultant's contract required submission of

all minutes from meetings and a monthly telephone log documenting all communications related to the project. However, the consultant admitted that he did not do this consistently, nor did the GDOT project manager enforce it.

Evaluation/Outcomes

GDOT's PDP and the consultant's contract required field plan reviews, coordination meetings with property owners and utilities, quality checks of plans, and submittals of several interim deliverables such as a design data book, concept report, environmental documents, hydrologic studies, and others. All these served as monitors of the project's progress and measures of the product quality. However, the consultant himself was not evaluated during the project, as it was not GDOT practice to do so back then, nor did the City of Alpharetta evaluate the consultant. Today, consultant evaluations are a part of field plan reviews, and GDOT evaluates them even if they have no direct contractual relationship with the consultant, as in this case. GDOT now has an evaluation procedure developed by the Office of Consultant Design. It assesses the project's adherence to schedule; the design's construct ability, the budget, the responsiveness of the consultant, etc. The consultant on this project first experienced such an evaluation in the latter half of the 1990s. He found that evaluations can really help the consultant if GDOT spends the effort to make honest and constructive comments.

The GDOT project manager and the consultant were both pleased with the output of relatively error-free designs that were well received by the public. However, they each attributed the success to different features. The consultant attributed the success to the comprehensive scope of their work, including all pre-construction activities, and the continuity of the staff in the three parties. The GDOT project manager, on the other

hand, attributed the success to the close coordination between him and the consultant and the consultant's familiarity with GDOT policies and procedures. To the GDOT project manager, the measures of the consultant's effectiveness were meeting the schedule, assuring quality, and making design decisions with confidence. Since this project the consultant has been awarded many more GDOT projects.

Causal Links

Prior GDOT relations facilitated trust, communication, and contributed to the project's success. The familiarity between the three parties involved with this project - the GDOT project manager, the consultant, and the City of Alpharetta project manager, facilitated trust early-on and throughout the project. In addition, the communication lines were streamlined as a direct by-product of the trust between parties, and these factors were directly attributed to the successful implementation process and product outcome.

Three-way contract format created authority problems. Throughout the project the consultant and GDOT worked directly with each other, rather than through Alpharetta as the contract suggested. This streamlined communication expedited the project, but it presented occasional problems when GDOT directed the consultant outside of the scope of work without the City of Alpharetta's approval. In this three-way contract, authority was not always clear. The consultant needed guidelines on when they could make decisions and when they needed to defer to GDOT or the City of Alpharetta. Clearly, the greater the number of parties involved, the greater the need for authority and lines of communication to be specified.

Lessons Learned

Training is needed for both GDOT project managers and consultants. Because of their experience in GDOT, the consultant for this case did not need any orientation to GDOT procedures and policies. However, when GDOT changes procedures, policies, standards, etc., even experienced consultants can have difficulty making adjustments. Indeed, GDOT needs to consider the effects of procedural changes on consultants, and offer them assistance to make the adjustments.

Although not specific to this case, respondents in this research did make reference to the large number of new GDOT project managers that require training and experience. This has become more evident in recent years due to the increased use of consultants. Thirty years ago, project managers spent most of their time designing projects and little time supervising consultants. When they did supervise consultants, the project managers had enough design experience to direct consultants and provide feedback. Today's project managers, replacing a cadre of retirees, are much younger than their predecessors and are being pushed into consultant management with relatively little experience and training. It is a negative feedback loop in which greater consultant usage demands more consultant managers, while providing less design experience for in-house engineers, and less experienced engineers result in greater reliance on consultants. GDOT needs to stabilize their use of consultants and better pace the professional growth of their engineers in order to groom consultant managers who are truly ready for the task.

CASE STUDY 4: OFFICE OF BRIDGE DESIGN

Case Summary

Project: This case study focuses on a project involving both road and bridge designs. The Office of Bridge Design hired a consultant to design preliminary layouts for bridges at five sites, prepare construction plans for six sites and check shop drawings. The layout for one bridge had been done in-house. The bridge designs had to be coordinated with road designs, thus GDOT's Office of Road Design communicated with the project manager on this project from the Office of Bridge Design.

Consultant's Scope of Work: The consultant was hired to prepare preliminary layouts for bridges at five sites, to prepare construction plans for bridges at six sites, and to check shop drawings as necessary for the construction of all of the bridges.

Selection Process: Informal short listing of consultants based on firm qualifications, final selection was based on lowest-bid.

Contract Type: Lump-sum/hybrid. After a qualifications-based selection of the top consultants, GDOT requested they submit cost-proposals, and the consultant that submitted the lowest-bid was selected.

Timeline:

1999: GDOT put out Request for Proposals late in the year.
01 2000: GDOT reviews proposals and asks for cost proposals from short-listed consultants.
02 2000: GDOT and consultant sign contract.
08 2000: Project stopped temporarily due to lack of state funding.
02 2001: Project resumes with a new project number.
02 2003: Consultant submits final shop drawings to GDOT.

Evidence from the Logic Model

Preconditions

The decision to hire a consultant was made by the Division of Preconstruction, under which the Office of Bridge Design is located. This project originally had a short timeframe projection, and due to the existing large work load in the Office of Bridge Design, GDOT deemed it necessary to hire consultant services to complete the project on time.

Bridge layouts cannot be done without road layouts, therefore throughout much of this project, the Office of Bridge Design relied on the Office of Road Design, which had decided to complete its part of the project in-house.

The GDOT project manager was an engineer with twenty years of GDOT experience. The prime consultant is a large firm with about 370 employees in 10 offices, whose headquarters are not in Georgia. The firm had no prior contracts with GDOT, although the original consultant project manager and a replacement project manager had previous work relations with GDOT. When the consulting firm was selected by GDOT for this project, it had no former-GDOT employees on staff, but it now does.Contracting

GDOT sent out a Request for Proposals in late 1999. Formal evaluations of consultant submissions occurred in January of 2000, during which a mid-level manager in the department reduced the submitting consultant list to five (with high-level GDOT approval) using both "formal" and "informal" criteria.[62] From this short-listed set of

[62] In GDOT, the selection procedure is rather well-defined formally. Yet these rather transparent aspects of selection did not eliminate "discretion" on the part of GDOT officials in the ultimate selection for this case. The process of selection in this case involved some discretionary elements (i.e., "informal") which go beyond sheer procedural and objective criteria. In this case, the decision maker juggled various considerations (e.g., efficiency and fairness) and weighed several alternatives before using professional judgment in selection.

consultants, GDOT reviewed cost proposals from each firm and hired a large firm with an extremely low bid to undertake the design work. This was the first GDOT project undertaken by the firm, and the low bid was an attempt by the firm to ensure selection in order to establish a working reputation with the department.

Implementation

The GDOT project manager served as the primary communication liaison for the project, coordinating personnel in the Office of Road Design with the consultant project manager responsible for Office of Bridge Design plans. This was a "linear" project in the sense that bridge designs could not be completed until the road designs upon which they depended were completed.

In implementing this project, problems of coordination arose as road design work lagged considerably behind bridge design work throughout. This lack of coordination caused lengthy delays in the implementation. Furthermore, although the contract for the bridge consultant was written for a tight time schedule, priority changes by the Office of Road Design, meant that the Office of Bridge Design was not able to stay on schedule. In principle the project manager is the person in charge of internal coordination. However, the task of convincing personnel in the Office of Road Design to keep up with the schedule was impossible. Although the project manager had leverage over the consultant, there was not sufficient leverage over other offices in GDOT whose collaboration was necessary to implement the project on time.

Among these considerations was the degree of "trust" invested in particular individuals (as opposed to the firm) who will partake in the project and interact with GDOT on a day-to-day basis. To make these "informal" assessments, GDOT decision makers relied on an extended "informal-professional network" to gauge the reputation of the proposed individuals.

Besides problems brought about by GDOT's organizational arrangement, implementation of this project was strained by several factors outside the department's control. These factors included problems with funding for the project, high turnover of consultant project managers, the use of replacement project managers by consultants with no experience in GDOT operations and procedures, and the extremely low bid used to win the contract resulted in insufficient pay for plan productions and ultimately led to project delays.

Funding for the project came from the state, and at one point funds were not allocated for the project. As a result, the project had a hiatus of several months. When funding was available for the project, it restarted under a different project number. The GDOT project manager speculates that this may have been the cause of some turnover of consultant personnel.

The firm selected for this contract was chosen in-part because it submitted, by a considerable margin, the least expensive proposal. GDOT managers were sufficiently concerned about the low-cost bid that they called the company to confirm the price. The consultant explained that they submitted such a low bid in order to establish a working relationship with GDOT. Although the project was ultimately successful in terms of product, it was a financial loss for the firm. Rather than proving to be a deal, from a GDOT standpoint, the project was fraught with problems.

Indirectly tied to the low bid problem was one of high turnover. The original consultant project manager was familiar with GDOT procedures having worked for the department while employed by another firm. However, just two months after the contract was signed, this consultant project manager left the firm. The replacement project

manager also had experience and familiarity with GDOT, but left in early 2001. The loss of these project managers was seen as a major setback for the project. The firm was forced to bring in a third project manager from Tennessee to complete the work. The final project manager had extensive experience with Tennessee DOT, but no previous GDOT experience. In an effort to salvage the situation, the firm chose to hire a sub-consultant with GDOT experience. However, the sub-consultant was adversely affected by the low bidding, because there was not enough allocation in the budget to cover the sub-consultant hours required to complete bridge design plans. Despite being underpaid, the sub-consultant continued to exert a good faith effort to protect their professional reputation.

The shift in personnel also radically shifted the level of hands-on management required by GDOT. Prior to the loss of GDOT-familiar consultant personnel, the project manager did not have to lead the project step-by-step. But this changed once the latest consultant project manager took charge. The GDOT project manager was dissatisfied with this situation as the inexperience of the consultant meant that significant management effort was necessary to ensure the success of the project. Consequently, the project manager spent considerable time working on plan revisions submitted by the consultant to ensure the project was of high quality and conformed to GDOT standards. With the shift in consultant personnel, micro-management became necessary to make up for the inexperience of the consultant. However from the point of view of the consultant, this close supervision reflected more a personal style of management than a real need.

Eventually the two sides came to understand each other and the initial resistance to micro-management vanished in favor of a mutually supportive and respectful dialogue.

In the end the project managers created a "win-win situation" and produced a set of good-quality plans from the project.

Evaluation/Outcomes

At the time of this project, GDOT did not have a formal requirement for evaluation and no performance records were kept. The Office of Bridge Design did not formally or informally evaluate the consulting firm. Progress and performance was monitored for the purpose of payment through discussion with the consultant and occasional submittals of progress reports. Progress was not assessed in depth until plans were submitted for final review. The project manager kept copies of the plans with comments marked on them as a record of progression of the work but the consultant was not required to submit written reports.

The consultant expressed the view that a formal feedback process would help identify areas of their work that could use improvement and felt the absence of such affected progress. All of the GDOT officials who worked with the consultant expressed the view that they worked very hard to obtain a good reputation with GDOT.

Causal Links

Strained coordination between GDOT offices delayed production. The inability of the project manager to make the other offices keep pace with the bridge designs was a salient cause of delay and turnover in the consultant personnel. Once road design stopped work on the project, bridge design could not proceed. This is a matter relating to the internal power structure in GDOT, but the fact that both the Office of Road Design and the Office of Bridge Design are under the same Division of Preconstruction did not suffice to solve the problem. Things would have been worse had the project manager been

inexperienced. Even with an experienced GDOT manager internal coordination issues were difficult in light of structural barriers to communication.

Consultant turnover also contributed to delay. The coordination issues addressed above, along with a tight budget, contractual pressures, and temporary unavailability of state funds were all exacerbated by the remarkable turnover of consultant personnel. This situation put undue pressures on the project manager who had to bring new consultant personnel unfamiliar with GDOT procedures up to speed on the project. Consequently, these new consultant personnel needed close supervision and substantial training. The Office of Bridge Design was pleased with the quality of the results, although they took a very long time to be produced.

Extremely low bids resulted in implementation hazards. There are problems if the winning firm's bid is unreasonably low. GDOT was sufficiently concerned about the low bid to raise the issue with the consultant. Assurances by the consultant with GDOT experience that this was a "reputation building" contract allayed some fears. However, when turnover occurred in the key consultant personnel, the low-bid began to pose problems. The inclusion of the sub-consultant in the project was a firefighting measure. However, the fact that the sub-consultant was underpaid compounded, rather than addressed, the problem of the inexperience of the consultant.

Lessons Learned

When a consultant's production relies on GDOT office production, coordination is key—especially with growing legions of inexperienced project managers at GDOT. In this case, there was no direct communication between the Office of Road Design and the consultant. The project manager was appropriately responsible for coordinating the two

and facilitating both ends of the project. However, an unintended consequence of this structure is that the Office of Road Design had no direct stake in the successful performance of the consultant. Their plans called for tight schedules by the Office of Bridge Design but the subsequent delays did not account for the consequences to the Bridge contract. This is a structural problem resulting from the institutional boundaries among different offices.

Relational contracting and administration are duties taken on by project managers. Training is key for success. Contracting between GDOT and the consultant resembled a relational (as opposed to more formal or procedural) model. There are certain advantages to having mutual trust lubricate the relationship in terms of reduced transaction costs. However, in an environment characterized by rapid turnovers and individual mobility among engineering firms, relational contracting may be hard to sustain. Presently, the Office of Consultant Design and the Division of Legal Services are well-defined, separate entities in GDOT, even if their functions partly overlap. At times, project managers find themselves in the "central administrator's role", a function for which their background did not adequately prepare them. Respondents indicated that GDOT should expect that in the future the project manager will need to play this role more often. There exists an urgent need to review the function of the different offices/divisions in GDOT related to contract administration and legal issues, to streamline operations, and to invest project managers with adequate skills and resources.

Better supervision and monitoring will provide better product, especially with first-time consultants. Adequate supervision and monitoring is necessary in all agency relationships where the incentive structure of the agent (i.e., the consultant) is not

identical to the principal (i.e., GDOT). Although a formal evaluation process is not necessarily the optimum choice for supervision and monitoring, it would have at least served as a vehicle for feedback on the project. The lack of systematic feedback to the consultant contributed to delays and frustration for both parties. This is especially true when consultants are unfamiliar with GDOT operations and procedures. In this case, the project began with experienced consultants. However, as inexperienced consultants came on board there was no resource for providing them training except through the considerable efforts of the GDOT project manager.

CASE STUDY 5: OFFICE OF ENVIRONMENT AND LOCATION

Case Summary

Project: This case study focuses on the environmental assessment aspects of a project to widen a two-lane highway to a four-lane highway as reconstruction of SR 3/US 19 from Angelica Creek in Sumter County to the Butler Bypass in Taylor County. Federal NEPA regulations required that an environmental assessment be done for the proposed construction.

Consultant's Scope of Work: The consultant was hired to prepare NEPA documentation and to oversee a cultural resources study that is part of the NEPA process. GDOT was responsible for special studies that were to be incorporated into the documentation.

Selection Process: The selection process was non-competitive. GDOT directly solicited the consulting firm based on qualifications on file for the needed services and previous experience on unrelated tasks for GDOT.

Amount of Contract: The original contract was for $175,105.17. The amount increased to $206,832.43 through a supplemental agreement for a Phase 2 archeological survey. No additional funds were authorized for project management despite a prolonged schedule.

Contract Type: Cost-plus-fixed-fee with a cap.

Timeline:

05 1998:	GDOT's Office of Environment and Location requests formal authorization to contract a consultant for this project.
10 1998:	GDOT and consultant sign the contract.
06 2000:	GDOT grants a supplemental agreement which extends the completion date to January 2001 and increases the budget.
07 2001:	GDOT receives federal approval of the environmental assessment.

Evidence from the Logic Model

Preconditions

GDOT required consultant services for this project due to the project's tight timeline and the insufficient availability of staff in the Office of Environment and Location. The consulting firm selected for this project is a large firm with offices nationwide. Although the firm had not previously done NEPA work for GDOT's Office of Environment and Location, the firm had done work for other offices within GDOT and had a good reputation among those offices. In this case, the firm met service demands by relocating a consultant project manager with NEPA experience from another state office. As a result, this marked the first time that this consultant project manager worked with GDOT or any of the three NEPA planners[63] that managed the project over the life of the contract.

Contracting

GDOT selected this firm from a list of pre-qualified firms and contacted them directly without using a competitive process.[64] According to consultant representatives, the pre-award audit process went smoothly for this project, and was attributable to the consulting firm's very detailed accounting procedures. The firm has a multi-million dollar accounting system that efficiently and quickly provides data that states require for contracts.

[63] According to a GDOT representative, the title of NEPA planner is usually interchangeable with the title of Contract Manager.

[64] In March of 2001, the Office of Environment and Location was found in violation of the Brooks Act for using non-competitive means to award contracts. The Brooks Act requires that competitive qualification-based processes be used to select architectural and engineering consultants contracted for projects that use federal aid. The Office of Environment and Location now employs competitive procedures to award all contracts.

Implementation

GDOT conducted most of the special studies for this project in-house. The consultant's primary responsibility lay with compiling information, conducting agency coordination and cultural resource studies, and pulling multiple sources of information together to write the NEPA documentation. The project was smaller than other NEPA contracts, because the consultant was not responsible for the entire process. The consultant project manager was told by the first GDOT NEPA Planner to think of work from this project as a benchmark for the DOT to evaluate the quality of work the consultant could provide; the implication being that other, more involved contracts might follow if the department was satisfied with this project. A sub-consultant was used to work on historical and archeological aspects of the project.

Although, the consultant project manager was experienced in writing NEPA documentation for other states, he had not worked with GDOT previously. Recognizing that every state has somewhat different procedures, he asked the GDOT NEPA Planner for a copy of what was considered the best example of NEPA documentation to be produced for the Office of Environment and Location. The consultant used this as a model for production.

GDOT and the consultant communicated frequently on this project, ranging from three times per-day to once per-week. From this communication, the consultant received required information and materials necessary to prepare the NEPA documentation and received informal feedback on his work.

A major impediment to this project's efficiency was attributed to the changes in GDOT NEPA Planners. This happened twice during the life of the project. cording to consultant representatives, each NEPA planner not only had a unique way of managing the project, but had different preferences for wording in NEPA documentation. This preference required document rewrites and delayed the project. Other project delays were caused by alignment modifications by location staff. In response to these combinations of project delays, a supplemental agreement was necessary to extend the contract's deadline and authorize more detailed archeological surveys in one location.

Evaluation/Outcomes

Overall, the use of a consultant for this project was a success. The consultant produced documentation with which the GDOT NEPA planner was pleased, and the final document was approved at the federal level without comments for revision. In addition, the consultant firm met deadlines and goals set by GDOT throughout the life of the project.

GDOT representatives attributed the project's success to two factors: the consultant's knowledge and experience with the NEPA process, and the consultant's good communication with multiple parties that supplied information for the project. GDOT recognized that NEPA interpretations are ever-changing and that to be successful, one must communicate well with involved parties, which the consultant did.

Consultant representatives credited the project's success to three factors: the firm's quick turnaround time and responsiveness to GDOT, the firm's concise and accurate NEPA documentation, and the ability of the consultant to recognize nuances and variations in procedures and findings which change during the project. Alignment

changes requiring more intense technical and archeological/historical studies are an example of the latter occurrence.

GDOT did not formally evaluate the consultant on this project; however, the consulting firm does have a formal evaluation process for its own purposes. The consultant project manager was evaluated twice during this project and received high scores from GDOT each time.

Causal Links

The firm's large size and previous GDOT experience enhanced its opportunities and capabilities. Due to the large size of the consulting firm, it could draw upon human capital outside the state of Georgia by brining in a consultant project manager with NEPA experience. This allowed the firm to enter a new technical area of consulting with GDOT, this being the first contract for the firm from the Office of Environment and Location. Also, because the firm had personnel with previous GDOT experience, the consultant could call on expertise and opinions of other employees of the firm to learn about GDOT rules and procedures. Using the same resources, he gathered information about sub-consultants.

Changes in GDOT NEPA planners led to delays and inefficiencies. Three different NEPA planners worked on this project. Each took time to get acquainted with the project, and the consultant had to adapt to the management approaches and individual NEPA wording preferences of each. These adaptations contributed to delays and impacted the need for a supplemental to extend the deadline.

The consultant's communication and coordination efforts contributed to the effective completion of the project. The consultant responded to GDOT requests quickly

throughout the project in order to facilitate the project's progress. In addition, frequent communication with the GDOT NEPA planner helped ensure the components of the document were written in compliance with the NEPA planner's expectations and preferences. This was important because of variations among the wording preferences of the three planners.

Despite the project's ultimate success, representatives from the consultant firm felt that a sense of teamwork was missing from this project, and sometimes felt that GDOT employees had an "us/them" view of the GDOT-consultant relationship. Also, GDOT employees were often slow to respond to consultant inquiries due to other GDOT priorities and turnover in personnel.

Unexpected changes in the project caused delays. During the project, delays were caused by changes in federal regulations regarding Native American coordination. There were also some major changes in alignment during the project. The consultant's research had to be modified due to the alignment changes, and the in-house studies by GDOT were also impacted. This caused the process to be drawn out longer than it would have been otherwise. A time extension was granted along with additional funds for archeology.

Lessons Learned

Communication protocols can ensure progress and prevent delays in a dynamic project management environment. To improve the consultant's performance and relationship with GDOT, representatives from the consultant firm indicated ways that communication could be made more beneficial. At the beginning of a contract, a GDOT NEPA planner could set a protocol for coordination of the project that would include the (1) NEPA planner's preferred means of communication, (2) the level of preferred project

management involvement, (3) the means of involvement by the NEPA planner, (4) clear articulation about the consultant's level of authority on decision-making without contacting GDOT.

CASE STUDY 6: THE OFFICE OF MAINTENANCE

Case Summary

Project: This case study focuses on a bridge repair and rehabilitation project that was contracted from the Office of Maintenance, Bridge Maintenance Division. Work for five different bridge locations—Cobb/Fulton, Catoosa/Whitfield, Chatham, Bacon/Bulloch, and Camden Telfair—were combined into a single contract with three separate scopes of work, each designating the specific needs of the bridge areas.

Scope of Work: At the Cobb/Fulton and Catoosa/Whitfield sites, the consultant was hired to prepare preliminary bridge deck rehabilitation plans, prepare final construction plans and specifications, review and revise final field plans and shop drawings, and perform engineering studies for stage construction and traffic maintenance.

At the Bacon/Bulloch and Camden Telfair sites, the consultant was hired to prepare preliminary bent rehabilitation and pile replacement plans for pre-cast concrete bridges with timber pile supports, prepare final construction plans and specifications, investigate bridge foundations and substructure designs, review and revise final field plans and shop drawings, certify right of way, and assess all environmental clearances required for federal projects.

At the Chatham site, the consultant was hired to prepare preliminary bridge deck joint rehabilitation plans, prepare final construction plans and specifications, and review and revise final field plans and shop drawings.

Selection Process: Competitive, qualifications-based selection.

Amount of Contract: This contract was for $738,035.

Contract Type: This was a lump-sum contract.

Timeline

01 2000:	GDOT issues Request for Proposals.
08 2000:	Office of Maintenance submits cost estimates to Office of Audits.
09 2000:	Office of Maintenance modifies the original contract. Consultant provides new cost estimates.
10 2000:	Office of Audits completes pre-award audit. Office of Audits pursues required GDOT signatures for project authorization.
11 2000:	GDOT sends formal notice to proceed to consultant.
11 2000:	Consultant submits first invoice to GDOT – one day after formal notice to proceed is granted.
10 2002:	Consultant completes all projects.

Evidence from the Logic Model

Preconditions

The Office of Maintenance is not sufficiently staffed to conduct projects that require significantly-sized plans, structural work, or engineering field work. Consequently, Maintenance would normally turn in-house to the GDOT Office of Bridge Design to do this sort of work. In 1998, federal regulations were relaxed allowing federal monies to be spent on heavy maintenance on bridges. As these monies became available Maintenance began contracting out for engineering services. The formal decision to use a private consulting firm was made by a team of senior engineers in the Office of Maintenance.

The project manager was a senior engineer charged with all consultant management responsibility for the Bridge Maintenance Division of the Office of Maintenance. The consulting firm for the project is an Atlanta-based firm with approximately 25 employees. A senior partner of the firm is a former long-time GDOT engineer. Prior to this contract, the firm had previously worked on GDOT contracts in

the Office of Maintenance and in the Office of Bridge Design, but this project marked the first time this GDOT project manager and consultant project manager worked together.

Contracting

During the selection process the members of the GDOT committee depended on inter-departmental references and previous professional experiences with consultant firms or the consulting team personnel to make their decision. Subsequently, the Office of Consultant Design created a formal evaluation system designed to keep an evaluation record of consultant performance to help inform offices in future selections of consultants.

The consultant submitted a fee proposal for this project during the mid-summer of 2000 in response to the Request for Proposals from GDOT. On August 1, 2000, the Office of Maintenance submitted cost estimates to the Office of Audits for review and approval. A detailed record kept by the Office of Maintenance shows that repeated unsuccessful attempts were made to facilitate the auditing process after cost estimates were submitted. The pre-award audit was completed in October 2000, and the final contracts were signed and a formal notice to proceed was granted in November 2000.

Since the Office of Maintenance is responsible for upkeep and repair, their work inherently possesses a critical time factor. In this environment, extended or even "normal" delays can be costly. In this case, documented evidence shows that the formal notice to proceed was sent on November 21, 2000. Shortly thereafter the prime consultant hand-delivered an invoice to GDOT for services already rendered. The $50,000+ amount (7% of the total dollars allotted for this project) suggests that work had proceeded prior to any formal notice being given. Although there was no "informal"

notice to proceed, the consultant made a decision to begin work due to information received that the contract would be signed and the project scheduled. Representatives from the prime consultant firm suggested that this type of process is not uncommon when a formal authorization to proceed is expected on a project.[65]

Implementation

The senior partner of the prime consultant firm is a former GDOT employee, and was heavily involved during the development stages of this project. As the administrative demands of acquisition were settled and the project progressed, the senior partner stepped aside and day-to-day project management involved only the GDOT project manager and the prime consultant project manager, both senior engineers. The management setting was relatively straightforward, with the project manager for GDOT acting as the immediate supervisor for the consultant project manager, who in turn was the GDOT liaison for the sub-consultants.

This one-to-one consultant management structure is common in the Bridge Maintenance Division where there is a large number of projects contracted by the division and only a single GDOT project manager to oversee them. In this demanding management environment, the GDOT project manager has designed a single liaison system that restricts the number of consultants that require direct management. The GDOT project manager grants the consultant project manager authority to make day-to-day management decisions about the project and to maintain accountability for the actions of the sub-consultants. In establishing this system, the GDOT project manager

[65] One might speculate that an "informal" notice to proceed would require at least three preconditions: (1) That the cost estimate had been submitted for an extended period and had been delayed outside the control of the contracting office, (2) That the project manager had a level of confidence, familiarity, and trust with the consultant firm or consultant project manager, and (3) That the work was time critical. Each of these three preconditions existed in this case.

drastically reduces the personnel resources necessary to manage each single project, and increases the total number of contracts the division can manage at any given time. In this environment, the GDOT project manager gives the consultant project manager a level of responsibility that mirrors that of other subordinates in GDOT. The GDOT project manager expects that the consultant project manager has the knowledge and capability to make competent management decisions that positively impact the project and positively reflect upon the division. Most communication for the management of this project occurred via email and telephone and dealt mostly with technical aspects that required decisions that the consultant was either unable or unauthorized to make.

Project success was credited to several factors: good managerial skills on both sides of the contract, compatible technical knowledge, open and short communication lines and quick turnaround in responses between the prime consultant and the GDOT project manager. One noted strength of this project was the ability of the GDOT project manager to "make decisions" and "give straight answers" to the consultant so that work could proceed in a timely manner. In addition, representatives from the consulting firm recognized that the Office of Maintenance generally has very thorough records of their bridges, and that personnel working under the project manager can fill in admirably if the project manager was unavailable.

Since this project, the working relationship between the GDOT project manager and this firm has matured. Given the quality of past work, the department has selected this firm to work on bigger, more complex and more lucrative contracts.

Evaluation/Outcomes

The project manager and the consultant identified similar indicators to measure the project's success: quality plans on a timely basis with minimum amounts of errors. Yet, with the exception of several interim deliverable plans which confirmed the project's progress, no formal monitoring was established for this project. Instead, the project manager stayed informed about the project's progress informally through frequent email messages and telephone conversations with the consultant. Mostly, this communication was delivered on a "need-to-know" basis, i.e., whenever the project manager needed to provide information to the consultant, or the project manager inquired about the status of some component of the project. In the opinion of the project manager and the consultant, this "need-to-know" monitoring process prevented undue interruptions and allowed the project to move forward rapidly.

The absence of a formal evaluation is not specific to this case but is common in this office. The project manager does not keep a formal evaluation of consultant performance but relies on memory and personal experience to mark the success or failure of consultant performance and production. Personal recollection of past performance serves as feedback for future consultant hiring. The Office of Consultant Design has recently established formal evaluation forms, and future projects for the Office of Maintenance may utilize them in selecting consultants in the future.

Causal Links

Previous GDOT experience may give consultant teams a competitive edge during the selection phase. The consultant for this case clarified that GDOT does not hire firms strictly on the basis of having a previous relationship. However, in this case, GDOT

managers acknowledged knowledge of the consultant through network contacts between GDOT employees familiar with the firm and the former GDOT employee with the consultant firm.

It is interesting to note that the project manager of this case mentioned that division superiors have recently stressed the need to remove criteria that give weight to previous GDOT contracts when evaluating consultant bids. The project manager recognizes, however, that the efficiency gains that occur by employing consultants familiar with GDOT procedure and quality standards are substantial and is somewhat hesitant to totally abandon this criterion.

Acquisition delays strain time-sensitive projects and small firms, resulting in adaptive management responses. Personnel in the Bridge Maintenance Division spent several months trying to facilitate acquisition through the Office of Audits. A telephone log shows repeated attempts by a Bridge Maintenance officer to move the project forward, but these efforts continued to be frustrated with delays. Archival records indicate that the delays were related more to a backlog in the Office of Audits than any problems with reporting by the firm.

The project manager recognizes that the Office of Maintenance has to adhere to the same bureaucratic requirements as other offices, but he also points out that Maintenance has more pressing timelines than other offices. When a bridge is in a state of disrepair there is a degree of urgency that is not shared by new construction projects. It appears that this condition led to the consultant's decision to proceed without a contract, so that when formal authorization did occur, an invoice for services rendered was submitted the next day for 7% of work already completed.

In addition to risks associated with the consultant proceeding without a contract, extended acquisition times can strain tremendously smaller firms which result in short-term and creative financial adaptations. The consultant for this case is a small firm that receives 90% of its revenue from GDOT. In the past, when delays in procurement have occurred, the firm has relied on short-term bank loans to finance payrolls, sometimes for several months. Smaller firms depend on consistent cash flows to maintain a skilled staff, and delays in project authorization can jeopardize their ability to do so. To date, GDOT does not have in place an assessment mechanism to integrate a firm's vulnerability to procurement delays.[66] Nor does GDOT have a method yet to recognize this variable in their selection process.

Lessons Learned

"Weeding-out" of inexperienced firms reduces the hands-on management requirements of the project manager in the short-term but could have long-term effects such as limiting the pool of prospective firms by consistent bias against first-timers. The project manager for this case tied project success to the selection of skilled consultants which effectively "weeds-out" unqualified firms. Part of the formula for determining whether or not a firm is qualified is linked—in this case, at least—to the firm's degree of previous GDOT experience. Previous experience was tied explicitly into the multi-criteria evaluation as one of the variables that was weighted, but was tied implicitly as well when considering variables such as "firm reputation".

Efficiency gains linked to using "GDOT-seasoned" consultants presumably relieves the project manager of the necessity to "train" consultants, ensuring that selected

[66] GDOT personnel indicate that delays are the real problem in the process. Recently, they have had 2 contracts authorized after 9 -12 months in Audits, and there is one still pending after more than 6 months.

firms have not only technical know-how, but also familiarity with GDOT processes and norms. In this environment, the project manager's role is limited to that of a technical specialist and authoritative advisor able to make meaningful decisions when the consultant feels uncomfortable making them for the department.

GDOT has since removed prior experience as a part of the evaluation criteria due to new evaluation policies. There is concern that a selection process that systematically shows bias against firms with no previous GDOT experience will perpetually put firms with experience at a competitive advantage and restrict new entry into the market. Such a system may promote an efficient management model that is hands-off, but the failings of such an approach in the long-run need to be considered.

Project manager's ability to answer meaningful questions strengthens process. When faced with an unanticipated or obscure matter in the field, the consultant at times needed feedback from the project manager at GDOT. It was seen as a strength in the process to have a senior engineer with authority make meaningful decisions as needed for the consultant to limit delays in the process. Respondents noted that such a system is not common in some other state DOT's which require a complex hierarchical process of decision-making authorization.

Consultants want evaluations and constructive feedback. The consultant for this case thought that evaluations of performance and product would be useful, but warned that such evaluations should be accompanied with constructive feedback and not just the "report card" that he had received with previous projects. In the past, the consultant had received a grade report for submitted plans from the Office of Consultant Design, but felt that OCD personnel had not been fair in considering the overall circumstances when

applying grade penalties. This matter could have been easily resolved, in the opinion of the consultant, if the GDOT project manager had been asked to explain the matter. In short, evaluations to this point in OCD's development seem distant and not thorough. A debriefing meeting between the consultant, the project manager and the OCD may improve the process.

GDOT's future in consultant management will be impacted by how the department recognizes the current importance of senior managers, the mid-manager gap and the importance of training junior managers. In this office, a single senior engineer manages all consultant projects. Although the intention to train subordinates for the task is a goal, the time strain of everyday operations has prevented training to date. If similar issues exist in other offices, this could have great impacts on how GDOT handles consultant management in the near future with a huge wave of impending retirements among senior managers on the horizon.

The consultant for this project commended the department for the incredible amount of work that is done with the available staff, but concern was also expressed about the future ramifications of having junior managers with only a few years of engineering experience thrust to the helm to supervise and manage large numbers of consultant operations. Part of this concern focuses on a brain-drain phenomenon whereby a significant portion of young engineers gain a few years of experience within the department and then enter the private sector, oftentimes to consult with GDOT. This occurrence leaves the department with a small number of extremely capable senior managers only a few years from retirement, a depleted set of mid-level managers and a large set of entry-level engineers with a large portion likely to be only short-term

employees of the DOT. How GDOT recognizes and accommodates for this need to train project managers will greatly determine the success of consultant management at the DOT in the near and distant future. GDOT's response in the Maintenance office has been to share consultant management duties based on task expertise. The assistant to the senior engineer is responsible for tasks in the pre-contract stages, while both the assistant and the senior engineer share duties in the post-contract consultant management.

CASE STUDY 7: THE OFFICE OF PLANNING

Case Summary

Project: This case study focuses on the High Occupancy Vehicle (HOV) strategic implementation plan developed as part of the Governor's Transportation Choice Initiative, a twenty-five year transportation plan for the metro-Atlanta region. As such, the project had a high political profile and was the first of its kind in the nation, drawing national and international attention.

Consultant's scope of work: The scope of work required the consultant to (1) assess costs, feasibility and demand of roadway corridors and nodes in the region, (2) evaluate operation alternatives (e.g., HOV vs. reversible lanes), and (3) develop an implementation strategy that included future demand forecasts. In addition to these tangible deliverables, the consultant was required to maintain a Public Involvement Plan to ensure that local stakeholders (e.g., county and local governments, planning bodies and citizens) were involved in the HOV planning process. In this capacity, the consultant served as a highly-visible representative for the department in a complex stakeholder environment.

Selection process: Competitive, qualifications-based, with cost considerations.

Amount of contract: This contract was for $ 2.3 Million[67].

Contract type: Cost, plus fixed-fee.

Timeline:

01 2001: GDOT submits Request for Proposals.
02 2001: GDOT reviews consultants' proposal submissions.

[67] The original amount for this contract was not to exceed $2 million. However, two expansions of the original scope of work increased the spending cap. Of the original $2 million allocation, federal funds accounted for $1,600,000 and state funds accounted for $400,000. Research did not reveal the source of additional supplemental funds.

03 2001:	GDOT selects consultant.
07 2001:	GDOT expands work scope and increases contract amount by $255,000.
08 2001:	Consultant conducts HOV Strategic Implementation Plan "kick-off" meeting.
03 2002:	GDOT Office of Planning expands work scope to include a traffic count data collection.
	GDOT authorizes a $200,000 contract supplemental.
02 2003:	Consultant fulfills original contract obligation.
	GDOT expands work scope to expend remaining funds.

Evidence from the Logic Model

Preconditions

Generally, GDOT's Office of Planning decides to hire a consultant based on whether or not adequate in-house personnel are available to complete the work. The Office of Planning did not have adequate personnel to complete the HOV study in-house given its size, complexity, and time burden, so a team of senior managers from several GDOT offices decided to hire outside assistance.

Contracting[68]

It was suggested by GDOT that most plans of this magnitude require between five to tens years to complete. However, this project, the first in the nation to take a systematic assessment of HOV feasibility in a metropolitan region, was designed for eighteen months. The political pressure was considerable and demanded a qualified and fast-working team to complete this complex and unprecedented study at an accelerated speed.

GDOT put out a RFP in January 2001, and a qualifications-based selection process (with cost considerations) was applied by a senior manager selection committee. In March, GDOT selected a large, national firm as the prime consultant. The consultant

[68] At the time of this research, the Office of Planning did not have a formal procedure for choosing consultants, but the office did follow PDP and TOPPS requirements for authorization to use a consultant.

project manager was relocated from a firm office in another state to lead the HOV plan. In addition, nine sub-consultants were hired. [69]

Originally, this cost-plus-fixed-fee contract was proposed to total no more than $2 million. Subsequent to the selection of the prime consultant, GDOT (at the request of a stakeholder) expanded the scope of work to include the creation of a web site, an enforcement plan, a "scanning" tour of other metropolitan HOV projects and an air quality improvement analysis. To compensate for these changes to the work scope, GDOT increased the contract amount by $255,000.

Implementation

During the acquisition phase and in the very early weeks of the project, operations were managed by two different GDOT project managers. However, each of these managers left GDOT. The first project manager was hired by a regional planning commission, and the second became a consultant. The third and final project manager, who has over twenty years of GDOT experience, began work on this project shortly after implementation began in August 2001 and continued oversight until the project's completion in early 2003.

Given that the HOV implementation plan had the potential to directly impact twenty-one metro-Atlanta counties and the operations of several regional planning commissions, GDOT created an advisory committee made up of representatives from county governments and planning and transit partners to provide input into the entire

[69] According to representatives from the prime consulting firm for this project, some of the sub-consultants were included primarily because of their geographic proximity, not because the firm required outside technical expertise. In fact, most of the demands of this project could have been completed by the large prime consulting firm in-house. However, it is recognized by the consultant that GDOT, at least informally, advocates the inclusion of local firms on projects, and so the decision to include local firms as minor sub-consultants was made to strengthen their project proposal.

planning effort. Although the primary GDOT contact person for this project was the project manager from the Office of Planning, the consultant and sub-consultants also coordinated with the Office of Urban Design.[70]

Early in the project, GDOT's project manager and the prime consultant manager established some rather strict project operation plans that created clear lines of communication. All correspondence to and from GDOT involving the Office of Planning or the Office of Urban Design either went through the project manager or consultant lead or included them in the correspondence. This early strictness was relaxed somewhat as the project progressed and as each of the various sub-consultants and GDOT personnel became more comfortable with the necessary cooperative structures of the project, so that the project managers allowed a more natural process to emerge for day-to-day operations over time.[71] Both the GDOT project manager and the consultant viewed this development of communication patterns as one of the project's strengths.

Project management during the first months was facilitated by weekly meetings involving the prime consultant, major sub-consultants and GDOT representatives. These meetings usually pertained to general progress and helped keep the process coordinated among offices. In addition, periodic workshops were led by the consultant during benchmark periods when consultant, GDOT and advisory committee coordination was truly essential to task coordination. There were ten workshops during the life of this

[70] In the early stages, GDOT's Office of Communications was vested with responsibility to coordinate public relations, but this office failed to fulfill its obligations, and so the consultant took the tasks of coordinating public meetings and creating press releases.

[71] This is not to say, however, that the GDOT or consultant project manager were ever far removed from the project, but to suggest that all correspondence did not have to move directly through the two contact personnel as roles were clarified.

project, and consultant officials credited them for keeping the complex network of participants on schedule.

One of the more unusual implementation aspects of this project involved a tour of other HOV departments across the nation. Since this type of comprehensive study had never before been undertaken, GDOT and the consultant team thought it wise to visit cities with operating HOV systems. These visits were credited with providing invaluable guidance information early in the study.

Evaluation/Outcomes

At the time of this research, the HOV project was on-going, so no final evaluation had been done. However, given the high profile nature and the multiple stakeholder framework of this case, the project manager emphasized the following measures of the consultant's effectiveness: (1) the production of information that GDOT partners (e.g., county governments and transit partners) considered satisfactory, (2) the production of high quality data in a timely fashion, even when many time constraints existed and (3) the consultant's ability to anticipate, understand and satisfy a diverse set of needs from GDOT's stakeholders. This last measure resulted in wide buy-in for proposals.

Tangible submissions also allowed the project manager to keep tabs on the project's progress. Benchmark deliverable dates occurred at the sixty-day and ninety-day marks, with a final deliverable report due upon completion.

Some other points worthy of mention are that the Office of Planning received a TRB award for this study, and the project was completed on-time and under budget. These facts exemplify the level of success this project had in terms of outcome.

Causal Links

Frequent meetings and periodic bench-mark workshops kept the project on time and helped facilitate the multiple elements of the project across partners. Because this project had such a complex management environment, in that multiple stakeholders, GDOT offices and consultants had input into the process throughout, the project relied heavily on periodic face-to-face meetings with representatives across all partners to facilitate and coordinate progress. During the early weeks and months, weekly meetings were held. But, as the project progressed, these meetings became less frequent, often occurring bi-weekly or monthly. In addition, the project manager and consultant relied heavily on benchmark/deliverable workshops that served as key focal opportunities for all stakeholders to gather for extended meetings, discuss ideas and reinforce the project's focus. These meetings were especially critical given the need to secure stakeholder agreement for this HOV implementation plan.

Lessons Learned

Stakeholder satisfaction is the measure of success. This study is on-going, has high visibility and has multiple partners both within and outside of GDOT, but there have been no formal procedures set up for monitoring, measuring or evaluating the consultant's performance during the project. Rather, GDOT officials asserted that the true measure of quality for this project rests with whether or not the multiple clients involved are satisfied with the work that the consultant provides during presentations and with other deliverables. The project manager suggested that satisfactory performance for a project like the HOV study can not be reduced to a few quantifiable measures, but instead is manifest with satisfaction of stakeholders which this consultant has accomplished.

In the public eye, sometimes the consultant is GDOT! Although the project manager at GDOT was the primary authoritative position for project decisions, the consultant represented GDOT to stakeholders in public presentations. During these presentations, stakeholders viewed the consultant as a representative of the DOT. In managing the public image for DOT, the project manager stayed well informed of the content of the meetings and often attended them. GDOT should be aware that the consultant was perceived in the public eye as DOT staff with authority to speak on GDOT's behalf.

What does it take to be a great consultant manger in a complex stakeholder-driven/politically-charged environment? It is possible that this project demanded more management skill from GDOT than any other case in this study. The project manager was required to monitor and/or direct multiple stakeholders, including members from GDOT, neighboring counties, private consultants and regional transit partners. In addition, political pressures brought about because this study was a priority for the Governor and a showpiece for the DOT in both the national and international arena added to management demands. Consider further the nearly-impossible-to-achieve deadline of eighteen months assigned to a study that broke new ground in HOV regional planning, and the fact that this study was a TRB award-winning plan that was completed under budget and ahead of schedule, and the argument that this project manager's task was the most daunting is difficult to refute.

Although the consultant project manager is to be credited for the project's success, she gave praise readily to GDOT's project manager and cited the following reasons for the manager's success. The project manager established her leadership position early in the process so that all stakeholders knew who the point person was at

DOT. Also, clear lines of communication and decision-making authority were implemented early so that significant decisions were not made without the project manager either being notified prior to, or being included in the correspondence of that decision. In short, the project manager stayed well engaged throughout the project's entirety.

The consultant also credited the project manager with knowing the larger goals and scope of the project and having the management skills to check periodically that the smaller planning duties stayed focused and reinforced the larger goals. The project manager stayed informed through email during day-to-day progress and through weekly/bi-weekly meetings and/or occasional benchmark-driven workshops for larger deliverables.

These management strategies may be applied more broadly to projects where multiple parties are engaged or when GDOT must delegate to the consultant the task of projecting GDOT's image to the public.

CASE STUDY 8: THE OFFICE OF TRAFFIC OPERATIONS

Case Summary

Project: This case study focuses on program management for NAVIGATOR, Georgia's Intelligent Transportation System (ITS), during Phase Two of its operation. Phase One (1993-1998) employed consultant services and consisted primarily of initial ITS deployment throughout metro-Atlanta. Phase One consultants installed closed-circuit television surveillance, video image detection cameras and processors, changeable message signs, a fiber-optic communication network to support communications between the various system components, and developed software to integrate collected data with geographic information systems.

Phase Two operations consisted of enhancements to ITS physical infrastructure and software applications, while extending the NAVIGATOR system to other metropolitan areas throughout the state.

Consultant's Scope of Work: The scope of work for this 54-month project was substantial and included both administrative and work-based tasks. Administrative tasks included program management, task-order development and cost estimation. Work-based tasks included plan preparation and design, systems integration, software service development, product testing, personnel training/evaluations and ITS construction monitoring. In addition, some consultant staff worked in GDOT's Office of Traffic Operations as an extension of the department's staff to provide system support for NAVIGATOR.

Selection process: Competitive, qualifications-based selection.

Amount of Contract: This contract was capped at $9,999,803, originally. One supplemental agreement raised that cap to $11,999,763.

Contract Type: Cost-reimbursable task-order, with a cap.

Timeline:

08 1997:	GDOT advertises Request for Proposals for Phase Two of NAVIGATOR.
10 1997:	Consultant submits a proposal in response to GDOT's Request for Proposals.
10 1997:	GDOT selects consultant.
11 1997:	GDOT's Office of Traffic Operations develops tasks for negotiations.
05 1998:	Consultant begins work on the project.
02 2002:	GDOT issues a supplemental agreement which extends the maximum allowable cost of the contract by $1,999,960.97.
06 2003:	Contract ends.

Evidence from the Logic Model

Preconditions

In 1991, Congress authorized $660 million through the Intermodal Surface Transportation Efficiency Act (ISTEA) to research, develop and test ITS projects. Georgia's NAVIGATOR is one of these federally-funded projects.

For Phase One of the project, GDOT chose to employ consultant services for NAVIGATOR, because the Office of Traffic Operations lacked the personnel and expertise required to plan, build and maintain an ITS program of this magnitude. The department invested heavily in consultant services to ensure that the initial ITS construction was completed before the 1996 Olympics.

In August of 1997 GDOT issued a Request for Proposals for Phase Two of NAVIGATOR operations. Three consultant teams responded to the RFP; each team consisted of firms that had worked on NAVIGATOR during the previous phase.

Contracting

GDOT employed a qualifications-based selection process which weighed heavily firms' personnel and the technical merit of the proposals. Because only three teams submitted proposals, a formal short-listing process was deemed unnecessary.

GDOT took thirteen days to select the consultant, with selection occurring on October 28, 1997. At that time, the firm was requested to provide a cost proposal for required tasks. The final contract value was established based on the best negotiated estimates for the tasks outlined in the RFP. The prime consulting firm established a formal teaming agreement with its multiple sub-consultants, with the task of software development and integration falling to one particular sub-consultant in that team.

Implementation

Phase Two operations began in July of 1998 with clearly established roles for each of the major players in the project: the GDOT project manager, the prime consultant and one major sub-consultant. The GDOT project manager from the Office of Traffic Operations was responsible for general project oversight and was mostly occupied with consultant coordination activities regarding task development, personnel issues and invoice approval. The prime consultant project manager was responsible for satisfying all items pertinent to the project's scope of work. While the prime consultant was expected to produce the bulk of the project, one exception written into the contract guaranteed that a major sub-consultant was assigned specifically to NAVIGATOR software development.

There was significant turnover in the ranks of both the prime consulting firm and GDOT over the course of the contract. In 2000, the initial GDOT project manager retired, while the consultant was promoting its third project manager to manage the contract. Fortunately, both GDOT and the firm selected replacements that were familiar enough with Phase Two to replace the original project managers. These new project managers assumed their new roles with minimal impact on the project. However, one

consultant project manager did mention that adjusting to GDOT invoicing practices took longer than expected.

In addition to this shift in key project personnel, GDOT created the Office of Information Technology (OIT) in July of 2000 as a way to centralize IT activities within GDOT. The primary GDOT contact person for software issues for NAVIGATOR was eventually moved to OIT, as were personnel assigned to scheduling and database support. During this critical time in the project, established communication paths that had previously facilitated project progress and management were strained. Formerly, management operated exclusively in the Office of Traffic Operations, with both the prime and software development sub-consultant interacting with personnel from this office.

With the introduction of OIT, the project manager in the Office of Traffic Operations continued primary communication with the prime consultant project manager on general project management issues. Issues dealing with software development began to operate somewhat independent of the prime consultant, with most interaction occurring between OIT personnel and the sub-consultant. That sub-consultant often discussed a task with the Office of Information Technology and proceeded without communicating with the Office of Traffic Operations or the prime consultant, thinking that they had the approval of GDOT. On a few occasions, the sub-consultant began a task and then was forced to stop because either the prime consultant or the Office of Traffic Operations found that the proposed task did not fit within the defined scope of the project.

In 2002, another personnel shift occurred and GDOT assigned a third project manager from the Office of Traffic Operations to the NAVIGATOR project. Again,

another GDOT employee familiar with the project took over with few repercussions on day-to-day operations of the project.

Throughout the life of this project, monthly update meetings were held during which the GDOT project manager and the prime consultant reviewed the progress of multiple on-going NAVIGATOR tasks. They reviewed budgets, assessed completed activities since the previous meeting, designed plans for the upcoming month and discussed on-going issues generally. As needed**,** IT personnel in the department and the sub-consultant responsible for software integration reviewed software-related tasks at these meetings. In addition to face-to-face meetings, the GDOT and consultant project managers communicated frequently via telephone or email.

As part of new task assignments, the GDOT project manager reserved some authority over consultant staffing. Typically, specific consultant personnel were not forbidden to perform a task due to inadequate quality of work or interpersonal problems, but rather because of inefficient allocation of personnel resources on the part of the consultant. Problems in the management of this project occurred often when the consultant firm would assign an individual to a task at a billing rate higher than was feasible for the task. In these instances, the GDOT project manager would request that a lower wage earner of the consultant workforce be assigned to the task.

Evaluation/Outcomes

At the time of this research, Phase Two operations were on-going. Therefore, no formal evaluation assessing the project's overall success had been completed, and it is unclear whether or not such an evaluation will be completed. During the life of the project, however, project monitoring took the form of benchmarks which were discussed

between the project manager and the consultant during meetings and via email or telephone.

GDOT officials considered the overall consultant working relationship for this project amiable and deemed the overall consultant work satisfactory. GDOT officials involved with the project even considered some of the consultant staff indispensable to NAVIGATOR's success. The success of the project has been attributed to the consultant staff's technical knowledge and dedicated work ethic. They were noted especially for adhering to work schedules and for producing productive project management meetings.

Despite the friendly relations between GDOT and both the prime and the software development sub-consultant, the prime/sub working relationship was at times hostile and strained by the inherent differences in information technology hardware infrastructure versus software development and integration. These differences are reflected in GDOT's recent separation of hardware and software responsibilities between the Office of Traffic Operations and Office of Information Technology. To the detriment of this project, this interference in the original flow of authority and information created issues in task creation and management. As a result, the two firms will not reenter their teaming agreement for Phase Three of NAVIGATOR.

Causal Links

Frequent communication between GDOT managers and the prime and sub-consultant ensured management coordination and ultimately the project's success. Day-to-day contact between GDOT and the prime and sub-consultants was crucial to the project's outcome. Frequent communication was especially important because of the task division between the prime consultant and the sub-consultant and the overseeing GDOT offices,

the Office of Traffic Operations and the Office of Information Technology. Although the network of managers interacting on this project occasionally faced problems due to the shifting of responsibilities between offices, the overall success of this project was a direct result of well-established GDOT/consultant communication pathways where management decisions were exchanged rapidly and frequently in light of the task-order development and management demands.

Splitting the consultant team between two GDOT offices mid-project led to errors in project assignments, causing a rift between the prime and sub-consultant. The Request for Proposal established the prime consultant as the plan designer and system operator of NAVIGATOR, with the understanding that the sub-consultant would be responsible for software integration tasks. With the creation of the Office of Information Technology in 2000, GDOT essentially divided the consultant pair, leaving the prime consultant to work closely with the Office of Traffic Operations, while moving the sub-consultant work into the Office of Information Technology. The movement of personnel from Traffic Operations to OIT was not immediate and absolute; it was more transitional in nature. However, this transition was not well-choreographed.

For example, the Office of Information Technology once approved a task proposal from the sub-consultant without formal authorization from the Office of Traffic Operations. The sub-consulting firm, thinking it had GDOT approval proceeded, but was forced to stop because the proposed task did not fit within the established scope of the project as defined by the prime consultant and Office of Traffic Operations.

Lessons Learned

Turnover in personnel does not always translate to a mismanaged project. Given the number of project managers on both the sides of GDOT and the consultant, the risk for breakdowns in communication and procedure was great. In order to mitigate this risk both parties promoted to the project manager position personnel with prior experience on the project. Whereas other case studies in this report involved procedural conflict after employee turnover at the individual level, this case did not. The interpersonal relationships fostered prior to individuals' promotions to project manager helped keep the project on track. Organizational constraints were often to blame for any contractual issues.

Ensure that all GDOT offices and consultants involved in a project adhere to their assigned roles and responsibilities throughout the life of a project. As exemplified in this case study, in the course of a 54-month project, personnel and even the structure of an organization can change. With the exception of supplemental agreements and intended contract modifications, the contract remains a fixed document throughout. The contract for Phase Two clearly outlines roles and responsibilities for GDOT and the prime consultant. If adhered to, the contract can serve as a tangible reminder and proof of the roles of the parties involved.

During the life of this project, several department offices and consultants were crucial parties in the process, but final authority for task development and approval rested with the Office of Traffic Operations (the office where the contract originated) and the prime consultant. This point is stated plainly in the contract, and if it had been adhered to, could have prevented occasional mis-assignments by the department.

CASE STUDY 9: DISTRICT 4, CEI CONTRACT

Case Summary

Project: This case study focuses on a construction, engineering and inspection contract from GDOT's District 4. This case is particularly noteworthy because of the nature of the consultant's scope of work (i.e. to provide ongoing services rather than a project or deliverable) and its affect on the relationships and communications between GDOT and the consultant staff.

Consultant's Scope of Work: The consultant's scope of work was to provide engineering technician CEI services on various projects in thirty-two counties of District 4. Services included construction inspection, field testing, documentation and general contract compliance. The consultant was tasked to provide these services for three years or until all project funds were expended.

Selection Process: Competitive, qualifications-based selection.

Amount of Contract: This contract was capped at $6,671,969. However, two supplemental agreements increased the total contract value to $7,389,111.

Contract Type: Cost-reimbursable task-order, with a cap.

Timeline:

01 2001: GDOT issues a Request for Qualifications.
02 2001: GDOT selects consultant.
08 2001: GDOT and consultant sign the contract.
03 2002: GDOT issues supplemental to change federal/state proportions of contributions.
08 2002: GDOT issues supplemental to extend the maximum allowable cost of the contract.
08 2003: Consultant completes contract.

Evidence from the Logic Model

Preconditions

According to the GDOT project manager, the district's need for contracted professional services is the result of two concurrent trends in recent years. First, the Governor's Road Improvement Program (GRIP) accelerated and expanded the workload on rural highways, creating a greater demand for labor. Second, GDOT has seen a significant portion of its workforce reach retirement, creating a shortage in labor supply. In response to these conditions, GDOT turned to consultants to fill the labor gap.

In a memorandum dated November 2000, the Acting District Construction Engineer requested from the State Construction Engineer in Atlanta approval for the use of consultant CEI services. The memorandum detailed the labor shortage in the district, and described an "ancillary benefit" of using consultants. It argued that if GDOT selected a consultant with many retired GDOT inspectors, those inspectors could help train the younger GDOT employees currently making up the district's CEI staff. The Director of Construction in Atlanta approved the request.

Contracting

This contract was GDOT's first application of a qualifications-based selection process to CEI consultant procurement. A Request for Qualifications was issued, and a selection team short-listed the submitting firms to the top two applicants. GDOT then sent a Request for Proposal to the short-listed firms. The two firms gave presentations at the GDOT headquarters in Atlanta, and negotiation of contract terms with the top firm solidified the contract. As part of these terms the consultant committed to exceeding the set DBE goal of 10%, in addition to setting up a local office in District 4.

Following selection, the consultant was required to submit a detailed fee proposal and information so that the pre-award audit could begin. The Office of Construction drafted the contract, and six months after selection the contract was signed. A Notice to Proceed was issued the same day.

Implementation

Prior to working for this consultant on this contract, the consultant project manager worked thirty years with GDOT. When he retired, he was the Acting District Construction Engineer. His job as the consultant's project manager was not unlike the one he left at GDOT where he managed a staff of inspectors on multiple construction projects throughout the district.

GDOT provided potential bidders on the contract with a list of retired GDOT inspectors in the area, suggesting that the more they hire the better. Of the thirty-four inspectors hired under this contract, eleven were former GDOT employees.

Due to their prior GDOT experience, many of the inspectors did not need CEI training. However, some of the new hires with no GDOT experience went through the standard training course on CEI work that any GDOT CEI inspector would take. The training program is minimal, focusing mainly on worksite safety and other agency-specific protocols.

Communication between district personnel and the consultant team occurred at all levels. The GDOT project manager and consultant project manager communicated at least a few times per-week, via two-way radio, email, telephone or personal visits. The consultants located their office within close proximity of the District 4 office, facilitating easy access and communication between the two parties. Project manager discussions

typically dealt with overall staffing (workforce allocation) and personnel issues such as hiring, firing and promotions of the consultant's CEI team. Any such personnel actions for this contract required the direct approval of the GDOT project manager.

While the GDOT and consultant project managers allocated staff to each area, the GDOT Area Engineers and the consultant Senior Inspectors were responsible for assigning individual inspectors to specific projects. Personnel often shifted between projects on a daily basis, requiring the Area Engineers and Senior Inspectors to communicate daily. On the worksite, GDOT project engineers and consultant inspectors communicated and coordinated directly among each other, and often their working relationship was not influenced by who employed them, but only their rank or role on the specific project. Inspectors reported to GDOT Project Engineers, assisting them with inspections, sampling, materials testing and contract administration.

Evaluation/Outcomes

Consultant evaluations occurred at the firm and individual inspector level as prescribed by GDOT policy.[72] The "Construction Engineering & Inspection Qualifications Based Selection Consultant Process" guidelines request the evaluation of the consulting firm and each of its inspectors at least once per-quarter using a standardized form. A similar, final evaluation is also recommended at the end of the contract.

[72] This policy was reinforced and extended to all offices on July 11, 2002, by an intradepartmental memorandum from the Chief Engineer to all Division Directors and Office Heads. In the memorandum, the Chief Engineer ordered the quarterly evaluation of all consulting firms, using a standard 5-point scale on 5 broad, weighted categories: management (25%), prosecution and progress (25%), quality of work (30%), cooperation and coordination (10%), and adequacy and availability of workforce (10%). Individual inspectors are to be evaluated quarterly, using a standard 10 point scale on 23 criteria weighted equally and falling under 4 broad groups: personnel, pay item quantities, reports and records, and inspection and field services. The consultant project manager mentioned that both the firm and inspectors take the evaluations very seriously and want to meet GDOT's highest expectations of them.

The GDOT project manager attributed the success of this project to the consultant project manager's knowledge and experience with CEI work and GDOT procedures regarding that particular work type. The GDOT project manager also felt that the consultant's ability to produce a skilled workforce coupled with effective management principles founded on the consultant project manager's experience in GDOT made the consulting firm a good choice for the project.

To the GDOT project manager, gauging the effectiveness of a CEI consultant really means measuring the effectiveness of their individual inspectors. The worth of an inspector, in turn, is measured by the individual's dependability, willingness to learn and advance and their experience with GDOT or other state DOTs. The consultant project manager took a more holistic view of consultant effectiveness. To him, his firm is effective on a contract if GDOT is satisfied with their work, his firm gets repeat business, a high level of quality was maintained throughout the contract, and they met GDOT's human capital demands at all times.

In this particular case, GDOT employees and consultant staff at each of the three hierarchical levels communicated and coordinated among themselves. The distinction between who was employed by GDOT and by the consulting firm was inconsequential.

Causal Links

The consultant's need for former GDOT inspectors was driven by a need to train new GDOT employees. The memorandum from the Acting District Construction Engineer to the State Construction Engineer detailed the significant labor shortage in the district. The memorandum argued that if GDOT selected a consultant with many retired GDOT inspectors, those inspectors could help train the younger district CEI staff. The Director

of Construction in Atlanta approved the request. This contract used the quality of the workforce acquired by the consulting firm as the primary criterion for selection. This workforce met all expectations of GDOT in not only completing their CEI responsibilities, but in helping newer GDOT employees gain needed experience in the field.

Lessons Learned

Relationship building and communication is important in service-provisioning contracts. The output of this contract was not the construction of a project or the delivery of a tangible product, but the supply of inspection labor to a district from 2001 to 2003. The GDOT project manager felt that a key to the success of the contract was the consultant project manager and his long standing, positive relationship with the GDOT district office. The consultant's setting up of a Tifton office for the project manager helped maintain that good relationship with the district office. Beneath the project manager level, the GDOT project manager found the consultant's inspectors to be no different than GDOT's, and treated them in that regard. The consultant project manager agreed that the firm's strength in this contract was the intimate knowledge they had of the region and the district office.

Variance in inspector evaluations has raised concerns in the consultant community. On this particular contract, GDOT Area Engineers evaluated individual inspectors quarterly and sent the evaluations to the consultant project manager and GDOT headquarters. The consultant project manager found the evaluations of his inspectors to vary from Area Engineer to Area Engineer. He found that different Area Engineers have different attitudes toward consultant inspectors, and often the variance in grading is more of a

difference of opinion of the grading system by the individual completing the evaluation. Because the consultant performance evaluation form states "The resultant rating for the given consultant or subconsultants may be considered in the future by the department in the consultant selection process for professional services and also in the prequalification process," variance in grades is of particular concern to the consultant community. If these grades are to be used in future selections, the consultant project manager felt consistency and standard must be developed and maintained in GDOT's procedures for evaluating CEI inspectors.

CASE STUDY 10: DISTRICT 5, CEI CONTRACT

Case Summary

Project: The focus of this case study is on a contract for CEI work performed in the northern part of District 5 between 1999 and 2002. A new three-year contract began in January 2003 to continue consultant CEI work in the northern section of the district.

Consultant's Scope of Work: The consultant provided approximately forty inspectors to do road and bridge inspections in twelve counties within District 5 from October 1999 until December 2002. The consultant provided construction inspection services, materials sampling and testing and contract administration for various construction projects in Bryan, Bulloch, Chatham, Effingham, Evans, Liberty, Long, Montgomery, Tattnall, Telfair, Toombs, and Wheeler counties. The consultant was required to use effective control procedures to determine and ensure that the contractors' construction projects were performed in conformity with plans, specifications, and contract provisions. Consultant employees also inspected traffic control and monitored traffic operations.

The original contract was a three-year contract that would have ended in October 2002, however a supplemental agreement extended the contract until the new contract began in January 2003.

Selection Process: Low-bid process.

Amount of Contract: This contract was for $6,389,324.00, money came from both state and federal sources.

Contract Type: Task-order.[73]

[73] The consultant was assigned projects throughout the duration of the contract for which it was required to provide inspections. The consultant was compensated at a price per-hour for personnel and per-mile for vehicle usage in the performance of the work.

Timeline:

10 1999: GDOT and consultant sign contract.
05 2000: GDOT authorizes a supplemental agreement expanding the scope of work to include twelve counties. The original contract covered only eight counties.
10 2002: Original contract completion date.
12 2002: Original contract ends.
01 2003: New contract begins.

Evidence from the Logic Model

Preconditions

When District 5 first decided to use consultants to perform CEI work in 1995, it was because the district did not have enough in-house personnel to handle its inspection needs. The district was unable to hire additional inspection personnel due to department policy, so consultants were employed to fulfill basic department duties. This trend has continued and has, in fact, increased since 1995.

The consulting firm for this project is a mid-sized firm located in District 5. Prior to this contract, the consultant had never had a CEI contract, but had done design work for GDOT. The consultant project manager was a retired long-time GDOT employee, who retired as an area engineer in District 5. Therefore, he is well acquainted with GDOT District 5 operations. In addition, many of the inspection employees of the consulting firm that worked on this contract were retired GDOT employees who had prior relationships with current GDOT employees.

Contracting

In 1999 District 5 received permission from the Central GDOT Offices in Atlanta to continue using consultants for CEI purposes.[74] The main office put out a Request for Qualifications bid package, to which consultants responded.

The consultant manager who was responsible for this contract kept close watch for GDOT consulting opportunities and preserved his relationships with GDOT staff after he retired. He knew prior to retiring that the department had plans to increase consultant use for inspection work, and so he kept communication with GDOT central offices and often visited the DOT advertisement web site.

The firm wanted to get its foot in the door for CEI work at GDOT, so a few personnel from the firm sat down and calculated the lowest bid they could submit that would still cover overhead. The firm benefited greatly from the consultant's GDOT experience early in this project, as his expertise was useful in accurately calculating a low (and executable) bid. They were willing to do this to give the firm more opportunity to win contracts with GDOT in the future.

The consultant submitted the lowest bid and won the contract. This contract had no sub-consultants, because the bid was so low that sub-consultants could not afford to participate in the contract.

Implementation

A GDOT project manager was responsible for each construction project. Private contractors did the construction, and GDOT and consultant inspectors checked their work. Consultant inspectors were assigned to and worked under the direct supervision of GDOT project engineers. Inspection work was split evenly between GDOT employees

[74] This 1999 contract came at the close of the 1995 contract.

and consultant employees. Consultant personnel on this contract worked side-by-side with GDOT employees as a team to accomplish the project objectives. The working relationship was amicable and consultant employees were treated as if they were part of GDOT.

There is a management hierarchy in CEI. The district construction engineer is the head contact for all the projects, and he makes most of the decisions that pertain to the consultant. The district construction engineer and the consultant manager communicated two to four times per-month throughout the project, and these conversations were usually regarding general updates on their progress and personnel matters.

An area engineer heads each area office and reports to the district construction engineer. GDOT area engineers oversee projects and visit the construction sites regularly. Project managers work at the sites with GDOT and consultant inspection personnel, which include senior inspectors, inspectors and inspector aids.

The consultant manager and the District Construction Engineer had a good working relationship, and the consultant involved the District Construction Engineer in staffing issues for employees working on the CEI contract, such as hiring new employees, promoting an employee, or moving inspection personnel around to different sites. The District Construction Engineer sat in on interviews and gave his opinion on the rank advancement of consultant employees. By keeping involved in these decisions, the District Construction Engineer knew the consultant personnel doing GDOT construction engineering and inspection work.

The GDOT district offers on-the-job training for GDOT employees and consultants who are new to the field. GDOT teaches its employees about aspects of

construction that would require inspection. The consultant manager is a GDOT retiree, so he already knew GDOT rules and procedures and did not require any training. This consulting firm has hired former GDOT employees who train younger consultant inspectors on GDOT policies and procedures. The consultant has an ongoing training program for inspectors and inspector aids. The firm has its own tests and booklets to train employees, and records of employees' training are maintained in their files. Training is for lower level employees, and by the time an employee is promoted to the higher levels of the consulting firm, there typically is no more need for training.

Most people hired by the consulting firm arrive with some training and experience. On this contract, it was not uncommon for young GDOT project managers to oversee the work of older, more experienced consultant senior inspectors. Many of the consultant's senior inspectors have retired from GDOT. Meanwhile, some of the younger GDOT project managers may have had an excellent education, but have little experience with construction inspection work. The consultant expressed that at times it was difficult for the older senior inspectors to work under young GDOT project managers, but this was not a major issue, and GDOT managers and area engineers often exhibited respect for the senior inspectors, knowing that they have a lot of experience.

Throughout this project there was ongoing monitoring of the consultant's efforts through the daily interaction between GDOT employees and consultant employees. In addition, the consultant was required to complete a great deal of paperwork as part of the duties for the job. Daily reports were kept by inspectors of operations, and inspectors were required to record all activities and events relating to the project and all work completed by the contractor. On a daily basis, each inspector also accounted for hours

worked and miles driven in timesheets. Monthly invoices were sent to GDOT by the consultant.

Evaluation/Outcomes

District 5 used evaluation forms developed in the Central GDOT Office in Atlanta before this contract started, so evaluations were done for the length of this contract. Formal evaluations were completed on a quarterly basis for the consulting firm as a whole as well as for every individual consultant employee working on the CEI contract. The evaluations were reviewed by the District Construction Engineer and then submitted to the Office of Construction. However, a final evaluation was not prepared once the contract was completed.

According to the consultant, his firm was effective because of their good management practices and training of consultant employees. Representatives from GDOT District 5 listed the consultant's knowledge, judgment in making sound engineering decisions, and familiarity with the department's policies and procedures as factors that are important to the consultant's effectiveness.

The GDOT district was extremely satisfied with the CEI work done by the consultant and signed a new contract with the consultant to do CEI work for the district for another three years.[75] The consultant manager, as a retired GDOT employee, knew what was needed and hired staff for the project that were qualified. When problems arose, he handled them promptly.

[75] A consulting firm that was interviewed for the Consultant Interviews Task of this research project for GDOT had submitted on the new CEI contract that started in January 2003 and was not awarded the contract. The consultant voiced concern that in the future it may be a waste of time for other firms to try to win this contract, because the consulting firm that was awarded the contracts that started in 1999 and in 2003 will continue to be awarded the contract again and again.

This GDOT district considers consultants to be necessary for the district to fulfill its duties. District 5 employees recognize that GDOT relies on consultants and has done so for many years now.

Causal Links

Consultants who are ex-GDOT employees require no training on GDOT procedures. The consultant manager on this contract had over thirty years of experience working for GDOT. In addition, there were GDOT retirees who worked on this contract as senior inspectors and trained young consultant inspectors on GDOT rules and procedures

GDOT retiree on the consultant's staff was an asset in applying for and managing the contract. Not only could the firm include the GDOT retiree in its qualifications for the contract, but the GDOT retiree, having worked as an area engineer within the same district, was extremely knowledgeable of what CEI work within District 5 entailed. He knew GDOT procedures, showed confidence in making decisions, knew what was needed for CEI work and chose skilled people to work for the firm on this contract. He also helped secure the contract, as he was able to help the firm determine the lowest bid the firm could offer while still covering overhead in the low-bid selection process.

Work environment facilitated good relationship. The nature of inspection work, in which GDOT and consultant inspection personnel worked side-by-side, fostered a good working relationship between the GDOT and consultant employees. GDOT and consultant employees worked on the same tasks, communicated, and learned together on the job.

Low-bid process helped consulting firm enter the market for CEI work. This contract was won by the consultant in a low-bid process. The consulting firm put in such a low bid to establish itself in GDOT's operations. The strategy used by the consulting firm to

sacrifice profit for the first three year contract in order to get into the market was effective. The consulting firm proved its ability, and in the next selection of a consultant for CEI work in District 5, which was qualifications-based, the firm won the contract. This GDOT district was extremely satisfied with the work performed by the consultant inspection staff; and as District 5 continues its dependence on consultants, this consulting firm has a good chance of continually winning CEI work in this district.

District 5 has become dependent on consultants for Construction Engineering and Inspection. Since CEI work is needed on an ongoing basis, and the district does not have enough personnel to do all the work, consultant dependence will continue.

Lessons Learned

In consultant selection, GDOT should also consider location of the consultant. The consultant selected for one of the 1995-1999 CEI contracts in District 5 was from Atlanta. It was expressed by a representative from GDOT District 5 that there were problems with that contract, because it was difficult to communicate and coordinate with the firm. The 1999-2002 contract, as well as the current contract that started January 2003, has worked better partially because the consultant and the GDOT office are both in the same area.

CASE STUDY 11: OFFICE OF CONSULTANT DESIGN, TASK-ORDER

Case Summary

Project: This case study focuses on a task-order contract for a statewide project.

Consultant's scope of work: GDOT's Office of Consultant Design contracted with the consultant in May 2001 to provide various design and engineering services. These services included preparation of Concepts, Preliminary Plans, Right-of-Way Plans, Special Studies, Specifications and Final Construction Plans on roadway and bridge projects statewide. The contract set up a specific amount of money, and as tasks are completed, the specific amount of funds set aside is depleted. As is common with task-order contracts, professional services to be provided are broad; the scope of work was not determined prior to the consultant selection process, instead projects are assigned by the GDOT as needed.

Selection process: Competitive, qualifications-based.

Contract Amount: This contract was for $3,300,000 - federal funds.

Contract Type: Task-order, with the consultant compensated on a cost-plus-fixed-fee basis.

Timeline:

01 2001: Consultant submitted Statement of Qualifications
05 2001: GDOT and consultant sign contract.

Evidence from the Logic Model:

Preconditions

The consultant selected for this project is a small local firm. The consultant firm has three former GDOT employees, all of whom worked on this project. Prior to this project, the firm had worked with GDOT on several contracts within the past three years

for services such as widening a state road, signal design and roadway improvements for bridge replacement.

Contracting

GDOT put out a Request for Qualifications and about twenty firms submitted Statements of Qualifications. Three GDOT personnel (the GDOT project manager and two design group leaders) evaluated consultant submissions and short-listed potential consultants to three to five firms. The evaluation utilized to select consultants for task-order contracts involves 15 weighted criteria. Reputation of firm and past performance, roadway design experience, bridge/structural design experience and experience with work order/on-call services are the criteria that are assigned the most weight.[76] The contract was signed in May 2001. Several GDOT project managers—those assigned to oversee task-order projects—are involved in the hour and rate negotiations for projects. Work orders have ranged in costs from $5,000 to $300,000 each.[77]

GDOT representatives attributed delays in the acquisition process to negotiations with the consultant, while consultant representatives attributed delays to audits and signature processes.

[76] The 15 criteria of the consultant evaluation for work order services are 1)Reputation of firm and past performance, 2)Project Manager, 3) Financial soundness of firm, 4) Stability of staff, 5) Roadway design experience, 6) Bridge/structural design experience, 7) Surveying/mapping/aerial photography, 8) Traffic engineering, 9) Geotechnical Services, 10)Availability of resources, 11) Experience with work order/on-call services, 12)QA/QC procedures, 13) Location of firm, 14) Experience with software, and 15) Intangibles.

[77] GDOT's informal policy is to ensure the general consultant community is not excluded from projects contracted out by the department. One example of this phenomenon is the "handshake agreement" exemplified in this case. The consultant employed sub-consultants for about 25-30% of work for this task-order contract, and Disadvantaged Business Enterprise (DBE) goals of 10% are tied to the contract. Although the prime consultant firm was not contractually obligated to sub-contract a specific percentage of work over the DBE 10%, it was understood informally between GDOT, the prime consultant and sub-consultants that the prime would include other sub-consultants in this project. Although non-compliance with the DBE's 10% goal does not result in penalties, the incentive is to spread the money, not burn bridges or ruin relationships with the consultant community.

The consultant manager works with the GDOT office project manager to determine man-hours needed for each task, along with schedule and scope. All work orders come from the OCD, and the OCD contract manager facilitates the work order programs. The OCD contract manager decides on which consultant is used based on their specialty, who needs work at the time, or if there was a specific request for the consultant.

Implementation

Implementation occurs through OCD in the following way: the OCD contract manager coordinates with a consultant counterpart about administrative duties, and both contract managers interact with project managers in their organizations for specific work orders and tasks, while personnel from GDOT and the consultant firm interact during project execution in the various offices. At the time the consulting firm was interviewed, they had 47 work orders under this task-order contract, which accounted for 2.5 million dollars of the 3.3 million dollar contract. The consultant manager expects that there will be a total of 60 work orders under the task-order contract.

The OCD contract manager meets with the consultant manager about every four to six weeks to discuss the status of the entire task-order, while the GDOT project managers are responsible for work on the individual work orders. Project communication usually occurs by telephone, email or in meetings between GDOT and consultant employees. On a day-to-day basis, issues are discussed and resolved between the GDOT project manager and consultant employees while keeping the consultant manager informed. The less experienced consultant employees rely on the consultant manager for

resolution. Many consultant staff members are trained on the job by former GDOT employees who help them learn GDOT procedures.

The consultant manager has observed inconsistency in the interpretation and enforcement of procedures between GDOT Districts and between project managers. Differences in interpretation of engineering specifications and design directives were attributed to the individual GDOT project managers rather than the OCD officer overseeing the entire task order.

Evaluation/Outcomes

GDOT recently implemented a formal evaluation process in which project managers evaluate consultants for each specific work order under a task-order contract and the OCD contract manager evaluates the overall contract. Evaluations are used as a formal guide for future consultant selections. Since the process is new, however, the consultant has only received one project evaluation.

Causal Links

Familiarity and frequent contact between the consultant firm and GDOT give a competitive advantage for project bidding. Representatives from the consultant firm acknowledged getting information about upcoming GDOT projects prior to the official advertisement by talking to GDOT employees with whom a positive relationship had been established. Also, firms stay in contact with other firms in the consultant pool to gauge when projects will be completed and when new projects will likely be advertised. Early knowledge about a potential project allows firms to survey and organize their human resources to create a qualified team. Although this informal notice is present, GDOT does make upcoming project information available to all consultants through the

RFQ which provides potential bidding firms equal access to information about the project opportunity.

Former GDOT employees were key in establishing trust. Initially, the consultant employees who had previously worked for GDOT were important in establishing trust between GDOT and the consultant. As quality of work was established, the relationship became less dependent on GDOT contacts.

Former GDOT employees were important in transferring knowledge. The consultant has developed a staff of former GDOT employees to help the firm know GDOT procedures. The transfer of GDOT procedure and departmental culture has helped develop a staff well prepared to contract with GDOT.

Lessons Learned

A proactive approach results in competitive advantage for the consultant. The consultant talks to GDOT personnel about projects coming up for RFP, RFQ, or RFC process. This information enables the consultant to create a team (which is required for a big project) for contract bids and gives the consultant the advantage over firms that rely exclusively on the website for knowledge of the process.

GDOT's evaluation is used as a measurement of consultant success. GDOT has a formal evaluation process to be used as a legitimate means for not rehiring a firm that performs poorly. Evaluations are a factor in being pre-qualified for work and can be used during the proposal review process. The previous process measured success only by the recurrence of contracts, as exemplified by this consultant that started about 5 years ago (prior to a formal evaluation process). The consultant teamed up as a sub-consultant in

order to get a foot in the door; performed well, and attended prime meetings. Prior to the current prime contract, they have had several other contracts over the last three years.

Task-order contracts allow flexibility in communication. Day-to-day project management under the individual work orders allows flexibility in communication. The consultant manager is able to work directly with GDOT project managers in other offices. Direct communication between managers on both teams saves time and confusion.

Consistencies in procedures are primarily between project managers. Interpretation of procedures depends on the individual GDOT project manager and differs between districts. The consultant sees a problem in how procedures are interpreted, followed and enforced.

CASE STUDY 12: OFFICE OF CONSULTANT DESIGN, TASK-ORDER

Case Summary

Project: This case study focuses on a task-order contract for the Governor's Road Improvement Program (GRIP).

Consultant's Scope of Work: GDOT's Office of Consultant Design contracted the consultant to provide design and engineering services for GRIP-related projects. These services included the preparation of concepts, preliminary plans, right-of-way plans, special studies, specifications and final construction plans on roadway and bridge projects. As is common with task-order contracts, required services were broad and not specified in advance. Instead, throughout the life of the three-year contract, projects were assigned by the DOT upon demand.

Selection Process: Competitive, qualifications-based.

Contract Amount: This contract was for $5,000,000 provided by state funds.

Contract Type: Task-order, with the consultant compensated on a cost-plus-fixed-fee basis.

Timeline:

03 1998: GDOT advertises GRIP project.
12 1998: GDOT and consultant sign contract.
11 2001: GDOT grants supplemental agreement to extend work for eighteen months.

Evidence from the Logic Model

Preconditions

The consultant firm selected for this project is a national firm. Prior to this contract, the firm had worked with GDOT on several contracts as a prime consultant and had also worked as a sub-consultant.

Contracting

GDOT issued a Request for Qualifications in March of 1998. Three GDOT personnel (the GDOT project manager and two design group leaders) evaluated consultant submissions, and the consultant was signed in December of 1998. The evaluation utilized to select consultants for task-order contracts involves 15 weighted criteria. Reputation of firm and past performance, roadway design experience, bridge/structural design experience and experience with work order/on-call services are the criteria that are assigned the most weight.[78]

Approximately fifteen GDOT project managers—those assigned to oversee task-order projects—were involved in the hour and rate negotiations for projects. Work orders ranged in costs between $7,000 and $400,000 each. Negotiations occurred for each individual work order with the GDOT project manager in the specific office throughout the life of the contract.

GDOT representatives attributed delays in the acquisition process to auditing and overheard rate reviews. The consultant representatives, however, attributed delays to "bottlenecking" at different levels in the department. Specifically, the consultant recognized multiple, cross-office signatures which took as long as six weeks as impeding to the process.

Implementation

[78] The 15 criteria of the consultant evaluation for work order services are 1)Reputation of firm and past performance, 2)Project Manager, 3) Financial soundness of firm, 4) Stability of staff, 5) Roadway design experience, 6) Bridge/structural design experience, 7) Surveying/mapping/aerial photography, 8) Traffic engineering, 9) Geotechnical Services, 10)Availability of resources, 11) Experience with work order/on-call services, 12)QA/QC procedures, 13) Location of firm, 14) Experience with software, and 15) Intangibles.

Implementation occurred through the Office of Consultant Design in the following way: the OCD contract manager coordinated with a consultant counterpart about administrative duties, and both contract managers interacted with project managers in their organizations for specific work orders and tasks. Personnel from GDOT and the consultant firm interacted during project execution among the various offices.

The OCD contract manager met with the consultant manager about every six weeks to discuss the status of the entire task-order, while the GDOT project managers were responsible for work on the individual work orders. Project communication usually occurred by telephone, email or in meetings between GDOT and consultant employees. On a day-to-day basis, issues were discussed and resolved between the GDOT project manager and the consultant manager. Problematic issues between the consultant employees and their GDOT counterparts were brought to the attention of the consultant manager who interfaced with the OCD project manager to keep him informed; however, such issues were resolved with the GDOT project manager.

One implementation delay for this project was brought about by a shortage in state funds. The funds allocated for this contract were in place, but funds required to actually construct projects that this consultant had been hired to design were not available. Therefore, the consultant did not receive work orders for an extended period of time. According to the consultant, generally all construction funds must be verified and available in order for GDOT to assign the design project.

Although the $5 million task-order contract was to last 3 years, the funds were not used within that time period, so a supplemental agreement was made to extend the

contract period. At the time the consultant was interviewed, the firm had 69 work orders under this contract.

Evaluation/Outcomes

GDOT recently implemented a formal evaluation process that requires project managers to evaluate consultants for each specific work order under a task-order contract and for the overall project. Evaluations are used as a formal guide for future consultant selections. Since the process is new, however, only a few of the work orders under this task-order contract that have been completed have been evaluated. Evaluations are done annually, so that long projects may be evaluated more than once. Representatives from the firm have complained that the evaluations are too judgmental and are inconsistent across GDOT offices.

The consultant, however, has its own evaluation process, whereby senior firm representatives review the consultant managers' performance with the OCD project manager. Such reviews are deemed necessary in order to get feedback from the firm's clients.

Causal Links

Familiarity and frequent contact between the consultant firm and GDOT give a competitive advantage for project bidding. Although not specific to this case, representatives from the consultant firm had knowledge about upcoming GDOT projects prior to the official advertisement by talking to GDOT employees with whom a positive relationship has been established. Also, firms stay in contact with other firms in the consultant pool to gauge when projects will be completed, and when new projects will likely be advertised. Early knowledge about a potential project allows firms to survey

and organize their resources to create a qualified team. Although this informal notice is present, GDOT does make upcoming project information available to all consultants through the RFQ.

GDOT's evaluation is used as a measurement of consultant success. GDOT has a formal evaluation process to be used as a legitimate means for not rehiring a firm that performs poorly. Evaluations are a factor in being pre-qualified for work and can be used during the proposal review process. Previously the consultant measured its success only by the recurrence of contracts.

Consultant trains new employees. The consultant firm recognizes that consultant employees need to be knowledgeable of GDOT's technical procedures such as design formatting and drawing standards, so the firm trains its employees to be proficient consultants for GDOT.

Lessons Learned

GDOT should improve processes that impede projects from moving to contract once the firm is selected. For the many work orders under this task-order contract, the multitude of required signatures were seen by consultant representatives as a major obstacle in the timeline for moving projects though to contract. This "select-no-contract" [79]on the master task-order contract phase can sometimes last nine months, during which the consultant firm allocates staff to other work.

[79] Select-no-contract is the term used by the consultant for the period when a consultant has been selected but the contract has not been signed. Consultants make adjustments to their day-to-day operations on the assumption the process will take about 9 months.

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APPENDIX A: THE CASE STUDY METHOD

In general, case studies attempt to describe the dimensions and range of an issue and to explain its causes and effects. Data for case studies can come from several sources, including personal interviews and archival records. Interviews with key players involved in the subject of study provide different perspectives of events that surround the phenomena and allow the researcher to gain insights into the dimensions, causes and effects of the phenomena. Through the use of an interview protocol, the interviewer is able to focus the discussion on the issue of interest. Relevant archival records gathered by the researcher complement interview data with quantitative and formal information. The researcher uses multiple sources of information to validate the evidence.

Besides the use of multiple sources of information, a single study can also utilize multiple cases, as this study does. The use of multiple cases strengthens the conclusions made by the researchers' analysis of the phenomena. When multiple cases show the same characteristics, for example, then corroborating evidence is produced to support the researchers' conclusions, that is, patterns can be seen across cases. On the other hand, variability among multiple cases can help the researchers identify a range of effects and their causes. Logic models, graphic models displaying the assumed chain of events, are used in the analysis of cases to help the researchers determine whether hypothesized causal relationships are true.

Case studies compliment other research methods – especially more quantitative methods such as structured surveys – by providing in-depth information on specific observations. The trade-off, however, is the degree of generalizability of its conclusions. Thus, of the various components of this overall research project, this case study report

presents the most in-depth information on specific cases of consultant management. The generalizability of its conclusions, however, must be substantiated by the other components.

Method

GDOT provided us with a list of GDOT offices that utilize consultants. We then contacted each of those offices and asked the chief of the office to nominate a few projects from his or her office for which they had utilized consultants. We asked the chiefs to nominate projects that 1) have been substantially completed, 2) were successful in producing the desired outcome, and 3) they felt held lessons for others on how to or how not to manage a consultant project. From this pool of nominated cases we then chose 12 for in-depth study. Our criteria for selection of the 12 cases included representation of many offices and each of the three major branches of GDOT, a mix of different consulting firms spanning different sizes and levels of experience with GDOT, and a representation of the offices' current practices in consultant management. All of these sampling frame criteria were met.

For each case, the GDOT project manager and consultant project manager were contacted by a member of the research team, the case study research was explained to them, they were informed that their project had been nominated and selected for a case study, and appointments were made for interviews and document reviews. Overall, participants were quite willing to be interviewed. The research team developed a semi-structured interview protocol which specified procedures to be followed while conducting the interview and topics to be covered in the interview, including specific questions that the interviewer could ask. (See below.) Usually, interviewees were sent an abbreviated

form of the interview protocol, so they could reflect upon their responses before the actual interviews. The interviews usually took place in a conference room at a GDOT office or the consultant's office to isolate the interviewees from the distractions of their work. Each interview was administered by a team of two researchers: one asked the questions and was the primary communicator with the interviewee, while the other took notes by hand or on a laptop computer. If the interviewee allowed, the interview was also recorded using a digital recorder. Prior to beginning each interview, background about the consultant management study for GDOT was again described to the interviewee, and a Human Subjects Consent Form was signed by the interviewee. Each interview lasted approximately 1 hour. All interviews for the 12 cases were conducted between October 2002 and June 2003.

At each interview relevant documents were collected and reviewed by the researchers. In some cases, the interviewee later sent to the researchers documents that were not retrievable at the time of the interview. After each interview, researchers reviewed the documents collected for the case and summarized in writing key facts found in the documents. The researchers also listened to the audio recording from each interview to check the quality and thoroughness of the notes taken during the interview. As necessary, additional information from the recording was included in the notes.

The information gathered from the GDOT and consultant interviews and the document review for each case was summarized and analyzed, and a case study document was prepared. The case study describes the events that occurred during the life of the project, important aspects of the case study that made the case note-worthy and lessons that could be learned from the case about GDOT's management of consultants.

Each full-length narrative is about 10 pages. They were submitted separately from this report, but are available upon request. A more concise synopsis was prepared for each case, and those are included in this report in Appendix B. Finally, in order to bring all the findings from this task together in a useful document, this case study report was written.

Interview Protocols

Two interview protocols were used for the case studies, one for GDOT staff and the other for consultant staff. The two protocols address the same topics in the life of the specific projects, but each was tailored to the participants' perspectives. The two protocols are summarized in Tables A-1 and A-2 on the following two pages.

Table A-1: Topics of Discussion with GDOT Staff

Topic: background and description of the consultant's tasks.
1. Please describe the task for which the consultant was contracted.
2. For this type of work, what do you consider to be the most important measures of the consultant's effectiveness?

Topic: deciding / planning to use a consultant.
1. How did you decide whether or not to use a consultant for this project or phase of project?
2. What alternatives to using consultants, if any, were considered?

Topic: consultant selection and contracting.
1. Describe the process followed to contract the consultant for this project and how this consultant was selected.
2. Has GDOT contracted this consultant before? Have *you* worked with this consultant before?
3. Can we copy the documentation – formal and informal – involved in the process of selection and contracting?

Topic: working with the consultant during the contract.
1. Who were the key people working on this contract?
2. Describe the roles and lines of communication between GDOT staff working on this project and consultant staff.
3. How often did GDOT and consultant staff communicate?
4. To what extent did you have to train the consultant on GDOT rules and procedures?

Topic: monitoring, measuring, and evaluating performance.
1. Was the performance of the consultant monitored and/or assessed during the project? How?
2. What reports, if any, were the consultant required to submit throughout the project?
3. Did the quality of the inputs into this consultant's tasks affect their performance?
4. Was there any formal or informal final evaluation of the consultant's performance on this project? If so, please describe it.
5. Can we copy example documentation of performance monitoring, consultant reports, and performance evaluations?

Topic: overall assessments.
1. Thinking over all the phases of GDOT's relationship with the consultant for this project, describe the strengths and weaknesses in it.
2. What skills or knowledge did the GDOT staff working on this contract have to have to successfully manage the project at every phase?
3. Would you contract this consultant again? Why or why not?
4. Do you have any other comments you would like to say about the management of consultants in this project?

Table A-2: Topics of Discussion with Consultant Staff

Topic: background and description of the consultant's tasks
1. Please describe the tasks for which your firm was contracted.
2. For this type of work, what do you consider to be the most important measures of your firm's effectiveness?

Topic: applying for the project and contracting.
1. How did you find out about this project?
2. Has your firm worked on GDOT contracts before?
3. Did you know who the competing firms for this contract were? How?
4. Describe in detail the process of obtaining a contract with GDOT for this project.
5. Are there aspects of this process that GDOT did particularly well or poorly?

Topic: working with GDOT during the contract.
1. Who were the key people working on this contract?
2. Describe the roles and lines of communication between GDOT staff working on this project and consultant staff.
3. How often did GDOT and consultant staff communicate?
4. To what extent did your firm's staff need to be trained on GDOT rules and procedures?

Topic: monitoring, measuring, and evaluating performance.
1. Was the performance of your firm monitored and/or assessed during the project? How?
2. What reports, if any, were your firm required to submit throughout the project?
3. Did the quality of the inputs into your firm's tasks affect your performance?
4. Was there any formal or informal final evaluation of your firm's performance on this project? If so, please describe it.

Topic: overall assessments.
1. Thinking over all the phases of GDOT's relationship with your firm for this project, describe the strengths and weaknesses in it.
2. What skills or knowledge did the GDOT staff working on this contract have to have to successfully manage the project at every phase?
3. If your firm has worked on other GDOT contracts, are GDOT's rules, procedures, and management consistent among each contract?
4. Would you contract with GDOT again?
5. Do you have any other comments you would like to say about the management of consultants in this project?

REFERENCES

Georgia Institute of Technology's Schools of Public Policy and Civil & Environmental Engineering. 2002-A. *A Literature Review of Consultant Management*. Georgia Institute of Technology: Atlanta, Georgia

Georgia Institute of Technology's Schools of Public Policy and Civil & Environmental Engineering. 2002-B. *System Review of Consultant Management*. Georgia Institute of Technology: Atlanta, Georgia

Yin, R. 1994. *Case Study Research: Design and Methods*. Second edition. Sage Publications: Thousand Oaks, California.