



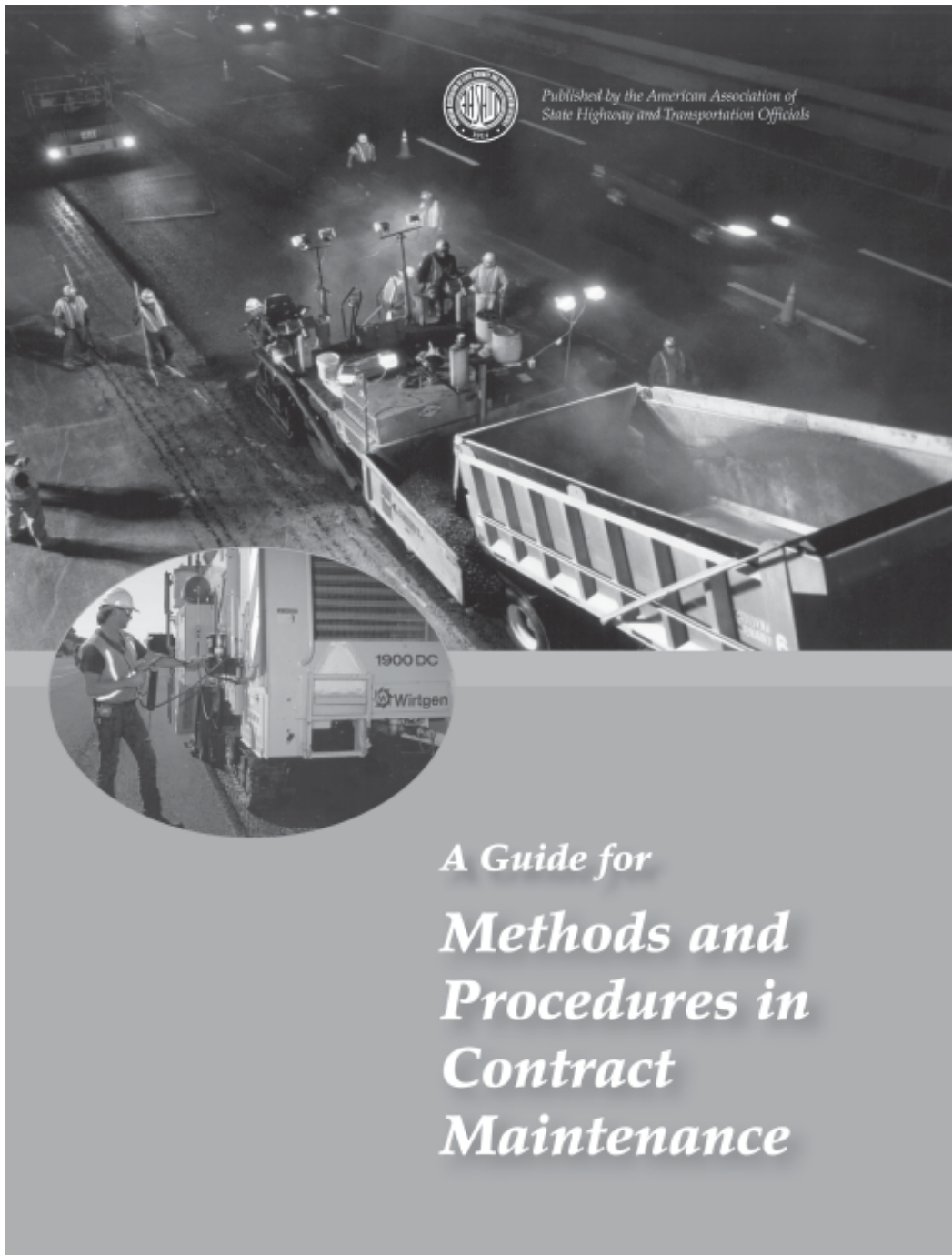
Published by the American Association of
State Highway and Transportation Officials



A Guide for Methods and Procedures in Contract Maintenance



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A Guide for Methods and Procedures in Contract Maintenance

Adopted and Published by the
American Association of State Highway and Transportation Officials
444 North Capitol Street, N.W., Suite 249 • Washington, D.C. 20001
(202) 624-5800
www.transportation.org

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Code: GMPC-2 ISBN: 156051-187-7

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Table of Contents

CHAPTER 1. INTRODUCTION TO CONTRACT MAINTENANCE

1.1 Introduction	1
Objective	4
Audience	4
1.2 Introduction to Contract Maintenance	4
Benefits of Contract Maintenance	5
Address Customer Satisfaction	5
Improved Use of Limited Resources	5
Lowered Life Cycle Costs	6
Increased Competitiveness and Taking Advantage of Advanced Technology	6
Increased Cost-Effectiveness	6
Issues in Contract Maintenance	7
Defined Roles and Expectations	7
Reasonable Goals	7
Displacement of Agency Workers	8
Loss of Information	8
Costs and Deterioration of Equipment	8
Contract Costs	8
Introduction to This Guide	9
1.3 Getting Started in Contract Maintenance	9
1.4 References	10

CHAPTER 2. MAINTENANCE CONTRACTING APPROACHES

2.1 Introduction	11
2.2 Contract Maintenance Approaches	12
Method-Based Contracting	12
Performance-Based Contracting	13
2.3 Contracting Relationships	15
2.4 Maintenance Functions Included in Contract Maintenance	16
2.5 Contract Selection	16
Contracting Methods	17
Lowest Responsive Bid	17
Technical Submittal and Negotiation	17
Best Value Approach	17
Proposal Evaluation Factors	18
2.6 Management and Evaluation of Contract Performance	18
Evaluation of Method Contracts	18
Evaluation of Performance-Based Contracts	19
2.7 Contrast of Contracting Methods	19

Method-Based Contracting Approaches	20
Performance-Based Specification Approach	20
2.8 Summary of Maintenance Contracting Approaches	21
2.9 References	22

CHAPTER 3: MAINTENANCE CONTRACT PROCEDURES

3.1 Introduction	23
3.2 Contracting Formats	23
Level I Contracts	23
Level II Contracts	24
Level III Contracts	24
3.3 Sealed Bidding	24
Other Forms of Agreement	25
3.4 Contract Duration	25
Method-Based Contracts	26
Performance-Based Contracts	26
3.5 Contract Performance Bonding	26
Method-Based Contracts	27
Performance-Based Contracts	27
Setting Bonding Limits	27
3.6 Warranties and Incentives/Disincentives	27
Warranties	28
Incentives/Disincentives	29
3.7 Payment Methods	29
3.8 Other Contracting Issues	30
3.9 References	31

CHAPTER 4: ISSUES IN CONTRACT MAINTENANCE

4.1 Introduction	33
4.2 Impact of Contract Decisions on the Contractor's Role	33
Contractor Innovation	33
Transfer of Risk	34
Duration of Contract	35
Contract Scope	35
Insurance and Liability Issues	35
Bonding	36
4.3 Performance Issues and the Contractor's Role	36
Performance Standards	37
Warranties	37
Level of Service (LOS) Requirements	38
Monitoring Performance	41

Incentives/Disincentives	42
Reporting	42
4.4 Bid Preparation Issues	42
Contractor Selection Process	42
Lowest Cost	42
Technical/Negotiation	43
Best Value	43
Special Proposal Preparation Materials Needed for Performance-Based Contracts	43
Change Orders and Retainer Clauses	44
Payment Terms	44
Scope	45
4.5 Agency Considerations	45
Deciding to Contract for Maintenance Activities	45
Availability of Competition	47
Contractor Prequalification	48
Availability of Federal Funding	48
4.6 Summary	48
4.7 References	49

CHAPTER 5: CASE STUDIES

5.1 Introduction	51
5.2 An Overview of the Case Studies	51
5.3 The Massachusetts Department of Transportation Case Study	51
Special Features	51
Program Summary	51
Program Results	52
Advantages	53
Disadvantages	53
5.4 Florida Department of Transportation Case Study	53
Program Summary	53
Program Results	54
Advantages	54
Disadvantages	54
5.5 Georgia Department of Transportation Case Study	54
Special Features	54
Program Summary	55
Program Results	55
Advantages	55
Disadvantages	55
5.6 Wisconsin Department of Transportation Case Study	55
Special Features	55

Program Summary	55
Program Results	56
Advantages	56
Disadvantages	56
5.7 Washington, D.C. Demonstration Project Case Study	56
Special Features	56
Program Summary	56
Program Results	57
Advantages	57
Disadvantages	57
5.8 Virginia Department of Transportation Case Study	57
Special Features	57
Program Summary	58
Program Results	58
Advantages	58
Disadvantages	58
5.9 Michigan Department of Transportation Case Study	59
Special Features	59
Program Summary	59
Program Results	59
Advantages	59
Disadvantages	59
5.10 Texas Department of Transportation Case Study	60
Special Features	60
Program Summary	60
Program Results	61
Advantages	61
Disadvantages	61
5.11 Conclusion	61
5.12 References	61
APPENDIX A (Examples)	A1
General Specifications/Conditions	A2
Bid Requirements and Conditions of Contract Maintenance	A9
Maintenance Management—Contract Inspection and Reporting	A15
Forms	A26
Sample Contract/Bid Proposal Package	A32

LIST OF FIGURES

Figure 1.1. Shift from in-house forces to contract maintenance	3
Figure 2.1. Comparison of risk and control for differing contract maintenance approaches	11
Figure 2.2. Agency-to-agency relationship	15
Figure 2.3. Agency-to-contractor relationship	15
Figure 2.4. Agency-to-program manager relationship	16
Figure 2.5. Characteristics of the different forms of maintenance contracts	22
Figure 4.1. Sample qualitative process from the LaDOTD	47

LIST OF TABLES

Table 2.1. Characteristics of each contracting method	21
Table 4.1. Assignment of risk for different types of contracts	34
Table 4.2. Warranty periods for MDOT preventive maintenance treatments (MDOT 1998)	38
Table 4.3: Sample pavement performance standards for a comprehensive asset management contract	40
Table 5.1. Summary of agencies and contract types in case studies	52

Preface

Contract maintenance is one of a number of tools used by transportation agencies to meet their objectives or mission. This guide summarizes current contract maintenance practices for transportation systems, and is meant to provide an overview of current practices to those agencies that are considering the use of contract maintenance. Its content is based on the experience and practice of other agencies that have been using these types of contracts, but it is not meant to advocate the use of contracts or to provide a cookbook approach or handbook to such activities. However, while this guide is not meant to serve as a handbook, it does contain sufficient information to differentiate between the types of contract maintenance currently being used, to identify some of the important issues that should be considered in developing a contract, and to illustrate the potential benefits through case studies.

This guide updates two earlier publications: in 1964 the American Association of State Highway Officials (AASHO) released *An Informational Guide for Methods and Procedures in Contract Maintenance*, and in 1987, *A Guide for Methods and Procedures in Contract Maintenance* (AASHTO) was published.

Chapter 1. Introduction to Contract Maintenance

1. INTRODUCTION

Highway agencies across the United States underwent dramatic changes in the 1990s. Arguably the greatest change involved the large number of state highway agencies (SHA) that experienced staff reductions or, in the language of the times, *downsizing* or *reinventing government*. At the same time, the overall responsibilities of agencies did not decrease, meaning that the same (or even more) work needed to be done with fewer or less experienced staff.

Another change that occurred in the late 1990s was the emergence of the Government Accounting Standard Board's (GASB) Statement 34. GASB 34 calls for state, local, and municipal governments to calculate the original cost of infrastructure constructed or improved during the past 20 years and account for those costs in their annual financial reports. Public agencies can either report the depreciation of their assets or, under certain circumstances, expense the cost to maintain and renew the infrastructure on an annual basis. This latter approach, called the modified approach, can be used if the agency has a systematic approach to managing its assets that includes, at a minimum, the following four requirements (FHWA 2000):

1. Having a current inventory of eligible assets.
2. Documenting the condition of those assets via a repeatable assessment procedure.
3. Demonstrating that assets are being preserved at a level predetermined by the government.
4. Estimating the actual cost to maintain and preserve the assets.

The impact of GASB 34 on transportation agencies extends far beyond changes in financial reporting statements, since transportation agencies will now have information to support decisions to preserve their assets instead of deferring maintenance. The new reporting requirements also place an increased emphasis on reducing life cycle costs, so it is very likely that pavement preservation activities will be shown to be more cost-effective than deferring maintenance and rehabilitation.

A third trend in highway agencies in the 1990s was the emphasis of the "customer" or highway user in the overall mission of highway agencies. One of the first attempts to gauge public opinion about roads was a 1995 nationwide survey of highway users. The results showed only a "moderate level of satisfaction with the highway system" and noted "there is considerable opportunity for improving public satisfaction with the highway system" (Coopers & Lybrand 1996). Desired changes identified by survey participants included permanent rather than temporary repairs and timely completion of construction and repairs. A summary of more recent surveys has shown an increase in the number of satisfied motorists in the United States (Better

Roads June 2001). According to the summary report, 60 percent of U.S. motorists are satisfied with pavement conditions on major highways, which is up about 10 percentage points from 1995. However, the number of motorists dissatisfied with pavement conditions also increased by 10 percentage points, meaning that fewer respondents claimed to have no opinion in the more recent survey. General dissatisfaction with work zones and the length of time it takes to make pavement repairs was also evident.

These nationwide surveys have been followed up by statewide surveys conducted by at least a dozen highway agencies. While the results have varied around the country, such surveys have identified many opportunities for providing improved service in the following areas:

1. Improved safety,
2. Reduced congestion,
3. Better road conditions,
4. Smoother roads, and
5. Less disruptive work zones.

The reported findings have led some state highway agencies to reorganize their activities to respond more directly to the specific needs of their consumers.

Overall, these changes may reflect the increased emphasis on performance and quality among highway agencies. Poister (1997) reported on current trends in state DOTs to measure performance as part of an increased emphasis on public accountability. Stivers et al. (1999) documented a related measure, the implementation of quality assurance (QA) programs in highway maintenance organizations.

Contract maintenance has emerged as one of a number of tools that agencies have used to successfully meet the challenges of the 1990s and 2000s. While perhaps its original purpose was to meet agency objectives in the face of staff reductions, today contract maintenance is also viewed as a means of meeting GASB 34 recommendations and improving customer satisfaction, although agencies cite a number of reasons for using contract maintenance. By 2000, a significant number of SHAs were contracting out portions of their maintenance activities, and some of those agencies had been involved in contract maintenance in one form or another for several years.

Contract maintenance is also part of a larger movement within highway agencies—the shift toward asset management. Asset management is a decision-making framework that allows an agency to use its resources more efficiently. According to the Federal Highway Administration Office of Asset Management's Annual Report, FHWA's primary focus is on physical assets including pavements, structures, tunnels, and hardware, although other assets (such as people, money, and information) could also be included (FHWA 2000). Some key elements of an asset management system for transportation agencies are listed below (FHWA 2000).

1. The framework for making decisions must be systematic, organized, logical, and reproducible.
2. Sound engineering, economic, performance, and behavioral models should provide the basis for analysis used to identify optimal investment strategies.
3. Information from the system should be communicated to all of the stakeholders.
4. Investment decisions should be based on performance goals established by the agency to meet customer expectations as well as organization policies and resources.
5. The framework should provide for alternate investment strategies and provide the agency with the information needed to weigh each alternative.
6. Decisions should be based on relevant, objective, and credible information.

These tools represent a new way of doing business for transportation agencies by considering performance and return-on-investment in the project selection process. These approaches allow an increase in the level of service provided to the traveling public on transportation agencies' limited staff and budgets. As a result, this century will see transportation agencies focusing more on management functions and less on the day-to-day technical functions, which are increasingly being outsourced. This change is reflected in Figure 1.1, which reflects how typical staff reductions, in the face of rising maintenance needs, have driven the use of contract maintenance.

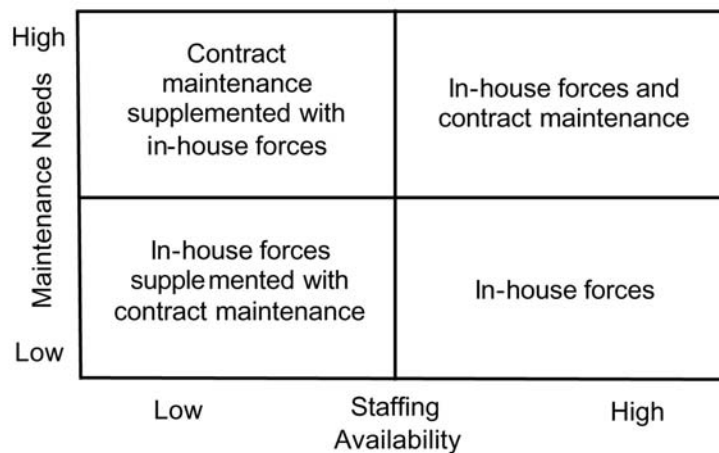


Figure 1.1. Shift from in-house forces to contract maintenance.

Caution: Agencies with adequate skilled staff to meet their maintenance needs should note that shifting to contract maintenance can have the unintended consequence of eventually leading to a loss of staff and the ability to perform the maintenance with in-house forces.

OBJECTIVE

The purpose of this guide is to summarize current contract maintenance practices for transportation systems, although it is also applicable to other types of activities, such as bridges, rest areas, landscapes, signs and structures, lighting systems, markings, and so on. In fact, probably every component of the infrastructure for which a highway department has maintenance responsibility has been considered for outsourcing. This guide is meant to serve as a reference for agencies considering the use of contract maintenance to accomplish part of their mission; its content is based on the experience and practice of other agencies that have been using these types of contracts. **This guide is *not* meant to advocate the use of contracts or to serve as a “cookbook” approach to such activities.** Instead, it offers transportation agencies options based on the experiences of other agencies that have used these approaches.

Audience

The intended audience for this document spans a range of potential participants in the contract maintenance process. These include, but are not limited to:

1. State highway agencies,
2. Contractors,
3. Federal Highway Administration (FHWA) personnel,
4. Local agencies,
5. Metropolitan transportation commissions,
6. Toll authorities, and
7. Members of the American Public Works Association (APWA) or National Association of County Engineers (NACE).

1.2 INTRODUCTION TO CONTRACT MAINTENANCE

The term *contract maintenance* covers several different types of contracts. The following definition is offered to describe this method of accomplishing maintenance functions.

Contract maintenance is the use of a contract to outsource maintenance activities (either to the private sector or to another public agency) that had been done by the agency itself.

Any type of maintenance can be performed by contract, including emergency, routine, and preventive maintenance activities. These include all routine and periodic maintenance activities that may be required for the repair of highway and roadway surfaces, shoulders, bridges, tunnels, drainage facilities, signs, road markings, and light fixtures. Other agency operations, such as lighting and signal maintenance or snow and ice control, are also contracted out by transportation agencies. Contract maintenance, also known as maintenance-by-contract and privatized maintenance, addresses the transfer of work traditionally conducted by the public sector to the private sector.

Two distinct types of contracts are typically employed by SHAs. The most common type specifies the means and the methods to be used to accomplish specific maintenance activities. This type of contract is referred to as *specification-based*. The other type of contract is *performance-based*, in which all risk for the maintenance of certain assets are transferred from the agency to the contractor in accordance with level-of-service requirements outlined in the contract documents. Virginia and Florida are two states that have been leaders in this type of contracting. In addition, the Federal Highway Administration (FHWA) is participating in a demonstration project of this type through a partnership with the Washington, D.C. Department of Public Works. Using these two contracting approaches, it is estimated that as of 1999 approximately \$2.5 billion in maintenance work was contracted out to the private sector. A number of state experiences with contract maintenance are presented as brief case studies in Chapter 5 of this guide.

Benefits of Contract Maintenance

Agencies generally undertake maintenance by contract because they expect to realize some advantage over their existing practices. Some of the primary benefits are discussed below.

Address Customer Satisfaction

Agencies that have experienced staff reductions recognize that contract maintenance is one way to provide the level of maintenance needed to meet customer expectations and/or agency goals. This can be accomplished several different ways:

1. Contract maintenance provides the agency with a means to carry out maintenance activities that otherwise would not be done. For instance, an agency that provided adequate levels of maintenance prior to downsizing would be hard pressed to provide the same level of service with a reduction in the number of maintenance crews. Contract maintenance affords these agencies an opportunity to use contract forces to provide the level of service needed.
2. With contract maintenance, an agency may be able to provide a *higher* level of service if it is used to perform activities that were previously deferred.
3. Agencies are able to reduce customer complaints when maintenance work is completed on a more timely basis.

Improved Use of Limited Resources

Another benefit of using contract maintenance is the ability to eliminate the ownership and maintenance of equipment for specialized activities. In the past, agencies have owned and operated all the equipment needed to conduct the various maintenance activities for which they were responsible. For some agencies, this has resulted in a large inventory of specialized

equipment that may not be used cost effectively. At the other extreme, the lack of specialized equipment has restricted the ability of some agencies to take advantage of new maintenance techniques. Agencies practicing contract maintenance have been able to avoid these situations because contractors maintain equipment fleets. Since the contractor can offer services to multiple agencies or clients, the cost for specialized equipment can be distributed to those clients, resulting in potentially lower costs for specialized maintenance procedures. This has allowed transportation agencies to allocate their limited resources to more appropriate uses.

Lowered Life Cycle Costs

Although there is some debate about whether contract maintenance saves an agency money, there is general agreement that maintenance contracts help to reduce the costs of periodic maintenance activities by leveling out some of the peaks and valleys associated with changing maintenance needs. This is especially true in agencies with significant amounts of snow removal during winter months, who may find they have excess staff in the summer months. Using contractors to provide some or even all of these services can allow agencies to maintain a core maintenance staff that is supplemented, as needed, under special circumstances.

Other agencies have reported that the use of contract maintenance lowers the cost of activities when all related costs are taken into account. In addition to potentially reducing the cost of maintenance activities, fixed price, performance-based contracts guarantee that throughout the life of the contract maintenance, costs will not vary. This fixed contracted cost can be a tremendous benefit for agencies that regularly experience fluctuations in maintenance funding.

Increased Competitiveness and Taking Advantage of Advanced Technology

As agencies increase the amount of maintenance work performed by private industry under contract, more contractors are entering the marketplace and competition is increasing. In general, increased levels of competition serve to reduce overall bid prices. Additionally, increased competition is an incentive to both the private sector and the agency to introduce innovations in equipment, materials, and maintenance techniques. This is especially true on contracts that are performance-based rather than specification-based. On performance-based contracts, as long as the contractor meets the level of service specified in the contract, innovative techniques can be used. In some instances, agencies have modified their internal specifications based on observations of practice by contractors on performance-based jobs.

Increased Cost-Effectiveness

There is a limited amount of information that documents the improvements in cost-effectiveness that are possible through the use of contract maintenance. However, when the agency specifies their expectations for the contractor, rather than the method of completing the work,

the private sector may be able to perform the work with greater flexibility and innovation, thereby leading to a higher quality product at a lower overall cost.

Issues in Contract Maintenance

The expected benefits have drawn a number of transportation agencies to the use of contract maintenance. However, some agencies have also expressed concerns about how these contracts will impact their operations. These concerns should be identified in advance and addressed during the contracting process before they adversely affect the performance of the contracted work.

Defined Roles and Expectations

For many agencies, their first experience with contract maintenance can be unsettling. While the agency may attempt to anticipate contingencies through their standard contracts, modifications are usually required to address special circumstances. Problems can still arise, however, when the agency and contractor have different interpretations or expectations.

The performance-based asset preservation project under way in the District of Columbia is an example where this was recognized as an issue early in the contract. The District of Columbia project is a fixed-price project with payments made on a monthly basis according to the terms of the contract. In the contractor's proposal, a mobilization period had been established although there was no maintenance performed while the contractor's work force was being put into place. Since the mobilization period signified the start of the contract, the contractor's payments began immediately. However, the District staff was resistant to making payments since no maintenance work was being performed. Together, the two parties were able to work out a compromise to address the situation. This project is further discussed in the case studies in Chapter 5.

It is also important for agencies to understand the type of contract that is established with the contractor, the contents of the contract and the roles of each party under the contract. Specification-based contracts call for the agency to dictate the means and methods of accomplishing the work. Performance-based contracts, on the other hand, measure the outcome of the work, transferring the responsibility for the means and methods to the contractor.

Reasonable Goals

Performance-based contracts require that an agency identify performance standards that must be achieved by the contractor over a multi-year period. Agencies with asset management systems in place have an advantage in setting these standards because historical condition information provides a solid basis for establishing reasonable expectations for performance. Without this information, agencies subjectively establish performance standards that may be higher or lower than existing conditions. The established performance standards have a tre-

mendous influence on the overall cost of the project to the agency because contractors establish their budgets based on their assessment of the work required to maintain the condition levels over the duration of the contract. In addition, the performance standards have a significant impact on the work priorities established by the contractor. Agencies should take steps to ensure that the performance standards established as part of a contract maintenance project are, in fact, the standards that are desired for the various assets since they will be the focus of the contractor's actions.

Displacement of Agency Workers

Within an agency, one of the largest concerns among maintenance staff is the fear of losing their jobs. In most instances, maintenance workers have not been displaced as a result of these types of contracts. Instead, the workers have been re-focused to improve and maintain the assets that are not being addressed through contract maintenance. However, agencies also face the risk of losing their most skilled staff to the contractors themselves, thereby also losing in-house capabilities that took years to develop.

Loss of Information

Some agencies that are contemplating the use of performance-based contract maintenance fear that once the contractor takes over responsibility for the maintenance of certain assets, the agency will no longer have access to information that is important for building asset management databases, or tracking asset performance over time. This issue can be avoided by requiring the contractor to provide the information that the agency requires on a regular basis. However, the data still needs to be validated, either by an independent contractor or by the agency itself.

Costs and Deterioration of Equipment

There are hidden equipment costs that may accompany contract maintenance, especially if the contracted work supplants existing agency capabilities. For example, if an agency owns equipment that it stops using, it will have to continue to depreciate the equipment, so that costs are incurred even though the equipment is not being put to work. Also, if the agency ever expects to resume using such equipment, it may be faced with high replacement costs. This is also the case if the agency does not have the equipment or has fully depreciated equipment; contract maintenance may simply defer an expense that will be much larger in the future.

Contract Costs

While agencies contracting for maintenance likely expect a cost savings, the savings may not occur in some cases. If the agency does not have the in-house capabilities for which they are contracting and there is no alternative to contracting for the service, the costs may be excessive. Costs may also increase if competition is not fostered or if long-term contracts eliminate local alternatives.

Introduction to This Guide

This guide on contract maintenance is intended to provide an overview to agencies interested in learning more about the subject. While this guide is not meant to serve as a handbook, it (1) presents sufficient information to differentiate between the types of contract maintenance currently being used; (2) identifies some of the important issues that should be considered in developing a contract; (3) and illustrates the potential benefits through case studies. In addition to this introduction, this guide is organized into the following chapters.

Chapter 2. Maintenance Contracting Approaches

This chapter introduces various contract approaches and describes their uses in transportation agencies.

Chapter 3. Maintenance Contracting Procedures

More technical information regarding the development of contracts and other specifications for this type of work are discussed in this chapter.

Chapter 4. Issues in Contract Maintenance

For most agencies, contract maintenance is a fairly new way of doing business. Chapter 4 focuses on some of the issues that contractors and agencies should be aware of as they begin work in this area.

Chapter 5. Case Studies

Several case studies are presented in Chapter 5 to familiarize the reader with factors that led other agencies to undertake contract maintenance and to describe the diversity in the types of projects that have been managed using these techniques.

Appendices

The appendices to the guide include other materials that may serve as important references to anyone embarking on a contract maintenance project. Included are examples of contract language used by transportation agencies on previous projects.

This guide updates two earlier publications: In 1964 the American Association of State Highway Officials (AASHO) released *An Informational Guide for Methods and Procedures in Contract Maintenance*, and in 1987, *A Guide for Methods and Procedures in Contract Maintenance* (AASHTO) was published. As much as there is a need for guidance today, those earlier versions addressed agency practice and experience in contracting for a range of maintenance activities.

1.3 GETTING STARTED IN CONTRACT MAINTENANCE

For most agencies, there is little choice as to whether or not contract maintenance should be used to supplement a depleted work force, provide a higher level of service to the traveling

public or take advantage of improvements in technology. Instead, the more appropriate considerations are how far the agency wants to go and how much they are willing to spend to get there. As shown by the examples included in this guide, contract maintenance has changed dramatically from its introduction in the mid-1980s. What started as a means of hiring contractors with specialized equipment or to respond to peak workloads has expanded dramatically in the past few years. Today, agencies around the world are realizing the benefits associated with the use of contract maintenance to maintain a variety of assets over multi-year periods.

The decision to begin contract maintenance is influenced by a variety of factors, both external and internal. For some agencies, the decision to privatize certain activities is mandated by statute or legislative pressure. In other agencies, the decision is influenced more by internal factors. Reductions in staff or other resources (such as equipment) inevitably lead to a reduction in the level of service provided to the traveling public. Economic analyses may determine that contract maintenance is a cost-effective way to improve that level of service, especially if adequate time is permitted for the benefits to be realized. Still others view contract maintenance as a way to establish managed competition. Regardless of the factors that contributed to the decision to begin using contract maintenance services, this guide will serve as a valuable reference.

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Chapter 2. Maintenance Contracting Approaches

2.1 INTRODUCTION

Historically, state highway agencies have performed most maintenance activities using in-house forces to meet their needs. For many agencies, contracting for these activities represents a new way of doing business. In order to realize the benefits that are possible through the use of these contracts, it is important to understand the available options and unique features of each approach.

This chapter identifies the two primary contract methods currently used in the industry:

1. Method-based contracts, and
2. Performance-based contracts.

These two approaches differ in their level of risk to the agency and to the contractor, as well as in the amount of control retained by the agency. These differences are illustrated in Figure 2.1.

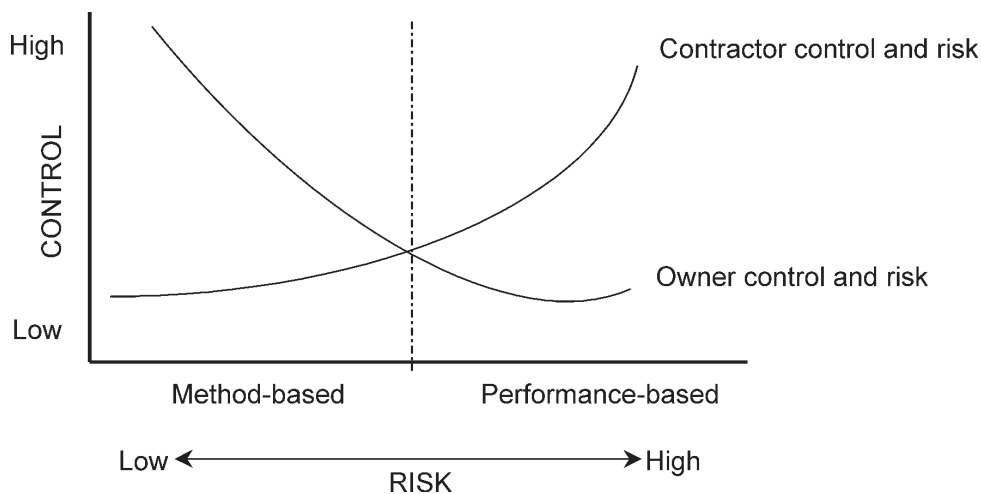


Figure 2.1. Comparison of risk and control for differing contract maintenance approaches.

This chapter introduces some of the primary characteristics associated with the two types of contracting methods. Topics include the level of risk to the contracting agency and the responsibilities of the agency under each approach. The material outlines factors for selecting the type of contract, scope of the contract, and other concepts, such as procurement mechanisms. The information presented in this chapter documents the most up-to-date methods. In the future, new innovations in contract maintenance are sure to be employed.

2.2 CONTRACT MAINTENANCE APPROACHES

In recent years, the scope of contract maintenance projects has changed dramatically. Traditionally, method-based contracts were used by highway agencies for single activities, but today, different contracting approaches enable agencies to accomplish different ends.

Method-Based Contracting

Traditionally, agencies that have relied on contract maintenance have used method-based contracts to control the work. Such contracts are issued to cover the completion of a specific maintenance activity, and the work may be either *directed* or *specification-based*. Directed contracts are often issued to specialty contractors who provide a specific service, such as mowing with litter control, or to contractors who can supplement work forces during peak periods when it would be impractical for the agency to build up its staff sufficiently. Key to this type of contract is the amount of direction provided to the contractor by the contracting agency.

Contractors bid on directed contracts by submitting a unit cost for each activity, and then all activities are summed to determine the lowest bidder. This has changed somewhat in recent years as agencies have moved to “bundled bid” packages. Some agencies take bids on a regional or district level for the services of a standard type of crew with prescribed types of equipment. In these instances, the bids are developed on an “as needed” basis, which provides the agency with some flexibility in determining the amount of work to be done. The work conducted by the contractor is usually covered under a bond agreement, as may be required by law.

Directed method-based contracts place all the risk for any errors in quantity development and/or changed conditions on the agency, with minimal risk to the contractor. The agency is also responsible for developing anticipated workloads; this can require substantial effort to define the inventory and identify past repair activities. The effort involved in the administration of the contract can also be substantial, depending on the number and size of the various contracts.

Directed contracts allow the agency to retain control in directing the work efforts through the use of work orders. This minimizes some of the financial risk to the agency and provides a means of addressing fluctuations in maintenance budgets. Agencies using this contracting method can also realize cost savings, especially if the bid prices indicate that the contractor can do the work at a lower cost than agency crews.

Specification-based contracts are alternate types of method-based contracts. In specification-based contracts, the agency identifies the means and methods to accomplish the maintenance activities under contract in accordance with the agency's previously developed specifications. A key component of this type of contract is the identification of the product (or procedural) specifications that must be used to assist the contractor in preparing a bid. This type of contracting has been most common for contracting work in specialty areas with a limited contractor base, but this has changed in recent years as agencies have expanded the use of specification-based contracts to include preventive maintenance applications.

Risk to the agency is still at moderate levels with specification-based contracts since the agency retains responsibility for determining the appropriate material and technique for each project under changing conditions. However, contractors do assume slightly more risk than with directed contracts since they have some influence on the way the specifications will be met. The administrative responsibilities of the agency can be fairly high, especially if agency staff is required to monitor the contractor's adherence to specifications. Contractors are normally required to have an active quality control program in place, but the agency is usually responsible for quality assurance.

Warranties have been used successfully on specification-based contracts to ensure that the desired project outcome and service length is achieved. Contractor's bonds are usually posted to cover any rework that may be required, but the resolution of disputes to determine responsibility for early failures must be clearly outlined.

Specification-based contracts are generally awarded to the lowest responsive bidder, as with directed contracts. If warranties are used, the contract costs may initially be higher to cover any work that may be required during the warranty period, but as the contractors become more familiar with the specifications and have an opportunity to reject projects that are not good candidates for the maintenance activity, the costs should return to a normal level.

A primary advantage of specification-based contracts is that the agency retains control in specifying the means and methods to accomplish the required work activity. However, if there are errors in the specifications, or if conditions change prior to the contractor's work, the agency also retains responsibility for contractual implications of those errors or changes. Agencies that have developed short contracting cycles that minimize the time between identifying a project and beginning the work have been the most successful in reducing the level of risk associated with changes in conditions.

Performance-Based Contracting

Performance-based contracting (sometimes referred to as outcome-based) is an increasingly used alternative to methods-based contracting. In performance-based contracts, the contractor is required to meet performance specifications outlined by the agency. Agencies using performance-based contracting typically apply it to the maintenance of all assets (from fence line-to-

fence line) within a highway corridor, and when this occurs it is also referred to as *total contract maintenance* (TCM).

In TCM, the contractor is responsible for determining the types of improvements needed by the facility in order to achieve the performance standards established by the agency. The scope for this type of project usually includes the management of the total right-of-way, including permit review approval for the owner's signature, bridge inspection of all bridge structures and overhead sign fixtures. The contracting agency retains responsibility for monitoring the performance of the contractor in accordance with the performance standards.

Performance-based contracts can also apply to a single activity. Such contracts combine the scope of many methods-based contracts (in other words, covering a single task over a limited area, with the performance requirements of this type of contract).

Performance-based contracts pose initial difficulties for agencies because they require the development of specific level of service (LOS) requirements for each of the assets to be maintained (See Chapter 4 for more on information on LOS). The contractor is responsible for determining the actual work effort that will be required to achieve the performance standards over the contract period, thereby shifting the risk for errors in estimating quantities to the contractor. The success or failure of this type of contract is largely dependent on the terms defined in the contract document, since responsibility for the means and method of performing the work shifts to the contractor. Performance-based contracts are usually for multi-year periods, with the agency retaining the option to renew.

Throughout the duration of these contracts, the contracting agency is responsible for monitoring the contractor's performance in accordance with the performance standards specified in the contract. If the performance standards are linked to an existing data collection activity, such as the data collection efforts of a pavement management system, no additional burden is placed on the contracting agency. However, early contracts of this type have not successfully linked the pavement management efforts with the performance standards, and some problems with monitoring the contractor's performance have developed. In any case, the agency should remain responsible for (and able to) collect and validate performance data.

Agencies that have used performance-based contracting have realized several benefits. For instance, maintenance forces formerly responsible for the contracted activities can be reallocated to a smaller part of the network, thereby more effectively covering a larger network. Agencies also benefit from the fixed contract amount normally associated with this type of contract and have often realized an increased level of service to the traveling public. While the initial costs may appear to be higher than the in-house costs, the total (long-term) costs of this approach have yet to be documented. However, several agencies with large-scale contract maintenance experience have projected cost savings significant enough to move forward with subsequent long-term total contract maintenance contracts.

2.3 CONTRACTING RELATIONSHIPS

In addition to selecting the type of contract to use, the agency must determine the type of agency-contractor relationship that needs to be established. The two primary approaches are agency-to-agency relationships and agency-to-contractor relationships. In an agency-to-agency relationship, one agency contracts with another agency to perform maintenance activities. For instance, a state highway agency might contract with a county to perform snow removal on certain state routes. This approach is represented in Figure 2.2.

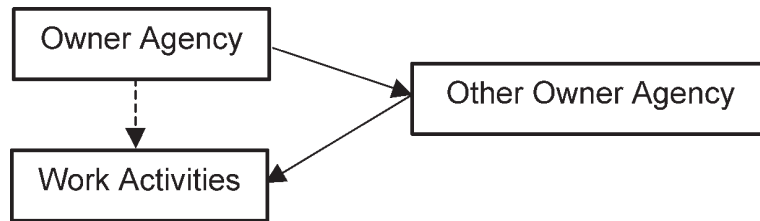


Figure 2.2. Agency-to-agency relationship.

More commonly, a transportation agency contracts with the private sector to conduct the maintenance activities. This approach is represented in Figure 2.3.

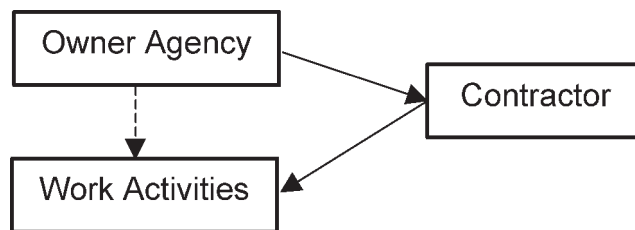


Figure 2.3. Agency-to-contractor relationship.

In other countries, another contracting relationship is being used. For example, in Australia, where privatization has been an accepted practice for many years, agencies contract with program management firms that are responsible for hiring the contractors who will perform the maintenance activities (See Haas et al. 2001, for example). In this capacity, the program manager acts as an extension of the transportation agency for contracting purposes. This last relationship is illustrated in Figure 2.4.

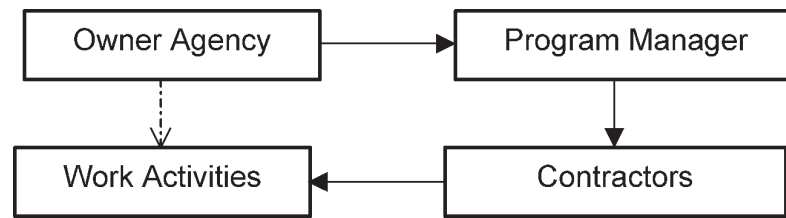


Figure 2.4. Agency-to-program manager relationship.

2.4 MAINTENANCE FUNCTIONS INCLUDED IN CONTRACT MAINTENANCE

Today, almost any type of maintenance function can be provided through a contract agreement. The most common applications involve routine maintenance activities, but other types of maintenance activities such as preventive maintenance, emergency maintenance, and minor rehabilitation have been conducted in this manner. In general, activity-based contracts (either methods- or performance-based) are used for routine activities that require specialty equipment or in instances when workloads need to be balanced. As discussed later, these are typically short-term contracts that address a single, well-defined activity. Agencies should consider the implications of contracting out work for which they have in-house capabilities and specialized equipment; one of the unintended results may be the loss of both the capabilities and the equipment so that they are unable to return to this type of work in the future.

Performance-based contracts have been used to cover a range of maintenance activities. In addition to routine maintenance activities, these contracts have included preventive maintenance techniques, minor rehabilitation activities, and emergency services. These contracts have also been used for maintenance of service features, such as rest areas. As described later in this guide, performance-based contracts are more likely to be applied to complex maintenance activities and will span a longer contracting period.

2.5 CONTRACT SELECTION

The contracting agency also must choose how the contractor will be selected. This process involves determining the contracting method as well as selecting the contractor.

Contracting Methods

No matter which contracting method is used, it is important for the contractors bidding on the project to have the technical qualifications to perform the work and the financial stability to stand behind any warranties on performance. Any unqualified bidders on a project should be eliminated from consideration so only responsive bidders are considered. Three main formats are used to issue maintenance contracts.

Lowest Responsive Bid

Historically, the most common contracting method has been to select a contractor based on the lowest cost. Contractors interested in bidding on work described in the *Request for Bids* submit bid documents that clearly state their unit prices for performing the work specified. The agency reviews the information and selects a contractor based on the best “buy” for the agency. In many agencies, legislative statutes dictate the selection process, resulting in the selection of the lowest responsible and responsive bidder. Since bonding is required on most maintenance contracts, the agency generally assumes that any contractor able to be bonded for the full value of the contract is qualified to perform the work. For short duration/low risk maintenance activities (such as mowing), the time and effort required to obtain a bond may be disproportionate to the timing and cost of the contract.

Technical Submittal and Negotiation

If legislative statutes do not dictate the selection process, another contracting method that might be considered involves a technical proposal followed by negotiations with the selected contractor. This type of contracting method is commonly used for engineering and design contracts. The primary advantage over the lowest bid approach is that contractors are selected based on their technical qualifications rather than just cost factors.

Under this contracting method, a *Request for Proposals* is issued by the contracting agency describing the proposed scope of work. Interested contractors respond with a proposal that describes their technical qualifications. Using technical qualifications as the primary decision factor, a contractor is selected to do the job. Negotiations with the selected contractor are then conducted until an agreed contract price is reached or the agency deems the negotiation effort not converging to an agreement. Should this happen, the agency may begin negotiations with the next highest ranked firm.

Best Value Approach

The last contracting method combines some of the best features of the previous two methods. Under this approach, technical qualifications are used to develop a short-list of the most qualified vendors based on a *Statement of Qualifications*. Those vendors determined to be most qualified are then issued a *Request for Proposals* and asked to submit a technical proposal and

a cost proposal in two separate packages. A selection panel reviews and evaluates the technical proposals independently, without opening any of the cost proposals. The consideration of the proposals follows the evaluation process developed by the agency with weights given to the most important factors in the selection process. The technical evaluations from each of the panel members are then compiled.

The second step is to then open the cost proposals so that costs can be entered into the overall ranking formula defined by the agency. Once technical and cost considerations are completed, the bid that represents the best value to the agency is identified.

Proposal Evaluation Factors

An agency interested in selecting the most qualified vendor for its work must take into account a variety of factors in the evaluation process. These might include past experience, qualifications of the staff and record of completion on past contracts. In the evaluation process, the agency's most important goals are to determine whether the contractor understands the requirements of the job, has the resources necessary to conduct the work in a timely fashion, and will complete the job in accordance with any established criteria. Proposals submitted by the contractor should include a technical plan for completing the work; any special considerations, such as emergency response plans or community involvement programs, should also be carefully outlined and evaluated by the selection panel.

One element that has been included in recent evaluation projects is consideration for any innovations suggested by the contracting firm. Including this type of condition quickly sets apart the most knowledgeable and experienced teams from others.

Agencies using technical proposals as the primary basis for selection should include the evaluation factors that will be used to select the most qualified vendor in its *Request for Proposals*. Any weights assigned to the various evaluation factors should also be detailed.

2.6 MANAGEMENT AND EVALUATION OF CONTRACT PERFORMANCE

Prior to the issuance of the *Request for Bids* or *Request for Proposals*, the contracting agency will have to determine the method that will be used to evaluate the performance of the contractor. Different contract types use different methods for evaluating performance. The specific contractual mechanisms used are discussed in Chapter 3. This section illustrates some of the characteristics associated with each of the contracting methods.

Evaluation of Method Contracts

As mentioned earlier, method-based contracts are the more traditional means of contracting maintenance activities. In directed contracts, the primary responsibility of the contracting agency

is to verify that the quantities of work claimed by the contractor match the agency's estimate of work complete. Since work is generally paid on a unit-price basis, this is the primary measure of a contractor's performance, but care should be exercised when establishing units for work. For instance, if a contractor is paid for crack sealing based on the quantity of sealant used rather than the length of cracks sealed, the contractor has little incentive to keep from applying crack sealant in wide bands over vast areas of the pavement surface.

Specification-based contracts impose a greater responsibility on the contracting agency to ensure that the contractor is performing in accordance with the specifications required. Generally, the contractor is responsible for having an effective quality control program of its own in place to assure that specifications are met. However, an agency is responsible for protecting itself by implementing a quality assurance program.

As discussed earlier, some of the recent specification-based contracts have used warranties as a means of ensuring that the desired performance period has been obtained. In Michigan, for example, specification-based contracts are used in the state's preventive maintenance program. The various treatments are warranted for either one or two years (depending on the type of treatment) to protect the state against early failures. Beyond the warranty period, the state assumes responsibility for any further deterioration. It is incumbent upon the contracting agency to identify an appropriate length of the warranty so that any defects from workmanship will come to light. Conversely, warranties may not be appropriate for activities in which defective work takes longer to appear.

Evaluation of Performance-Based Contracts

As previously noted in performance-based, contracts the agency establishes outcome-based performance standards prior to the release of the *Request for Proposals*. The standards are meant to clearly describe the agency's expectations of the contractor for each of the assets included in the contract document. It is the contractor's responsibility to evaluate the performance of the assets during the contract period to determine where maintenance is required and what technique would be most appropriate. The agency, on the other hand, generally checks the performance of the contractor (in accordance with the performance standards) on a regular basis that may range from weekly to annually depending on the type of asset under consideration.

2.7 CONTRAST OF CONTRACTING METHODS

Perhaps the best way to explain the different contracting methods is through the use of an example. A simple case is an agency deciding to contract out edge striping to private industry.

Method-Based Contracting Approaches

In this example of a *directed* contract, the contracting agency is interested in contracting its edge striping for a three-county area. A request for bids was issued and multiple contractors responded. The agency reviewed the bids to be sure each contractor was bonded for conducting the work and selected the contractor that proposed the lowest unit cost.

During that summer, as the agency needed paint striping carried out, work orders were issued to the contractor describing the location of work and the linear measure of striping to be performed. As the work was completed, the contractor prepared invoices for the quantity of work conducted at the unit price that was bid. The contracting agency verified the work was completed and approved payment of the invoices.

Under a specification-based approach to contracting, an agency issued a request for bids from various contractors to perform edge striping. Using an approach similar to the previous example, the contractor was selected based on the lowest responsive bid. Once the contractor was selected, the agency issued work orders that clearly described the work locations and quantities. Knowing the specifications that were to be followed, the contractor established a quality control program that would help ensure that the contract requirements were followed. Invoices specified the amount of work done and the unit cost for the activity.

As the contractor conducted his work, the contracting agency followed its own quality assurance program to protect against non-compliance on the part of the contractor. The quality assurance program included systematic checks to verify the quality of the material being placed and to ensure that federal and state specifications had been followed.

A warranty for one to two years may have been included in the contract terms. If so, the contractor would be responsible for failure of the edge stripe during the warranty period.

Performance-Based Specification Approach

In this example, prior to issuing a *Request for Proposals*, the contracting agency established a performance specification that described the retro-reflectivity expected from its edge striping and the maximum allowance of failed markings before replacement was required. Using this information, several contractors prepared technical proposals outlining their experience in this area and their ability to provide the level of service expected by the contracting agency. As outlined in the *Request for Proposals*, bidding contractors also provided a fixed-price cost estimate for completing the work over a five-year period. The bid was based entirely on each contractor's assessment of current edge stripe conditions, their knowledge of edge stripe deterioration, the equipment and materials available to them, and their estimate of quantities and costs over the five-year period.

Using a combination of technical and cost evaluation factors, the contracting agency selected a contractor to assume responsibility for all edge striping activities in the three counties. As