Innovative Contracting Strategies for Transportation Maintenance Outsourcing

Cindy L. Menches, Ph.D., P.E.
Juan Chen, M.S.

Texas Department of Transportation
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Overview

Research Motivation and Objectives

Research Methodology

Research Findings and Deliverables
- Maintenance Contracting Strategy Selection Framework
- Maintenance Contracting Strategy Selection Guide
- Case Studies on Innovative Maintenance Contracting Strategies
- Maintenance Contracting Strategy Selection Aid Tool

Conclusion and Recommendations
**Research Motivation**

- TxDOT is expanding maintenance outsourcing as a result of budget and manpower restraints.
- TxDOT wants to identify efficient contracting strategies that might be implemented to help them achieve their maintenance goals.

**Research Objectives**

- Identify innovative maintenance contracting strategies that are being used by other districts, other state DOTs or other countries.
- Develop a decision method for selecting appropriate contracting strategies for outsourcing various maintenance activities.
Research Methodology

1. Literature review: Identify and define maintenance contracting strategies used worldwide

2. Define the three components of a maintenance contracting strategy

3. Online surveys: Investigate maintenance contracting practices in TxDOT and other 50 DOTs

4. Interviews with 6 TxDOT districts and 5 other DOTs to investigate maintenance delivery methods

5. Develop a Maintenance Contracting Strategy Selection Framework


7. Develop a Contracting Strategy Selection Algorithm

Literature Review: Maintenance Contract Methods

Individual Activity
1. Individual Activity Contract Method
2. Jointly-Performed Maintenance Contract Method
3. Long-term Separate Maintenance Contract Method
4. Framework Contract Method

Nearly All Activities
6. Partial Competitive Maintenance Contract Method
7. Routine Maintenance Contract Method
8. Integrated Maintenance Contract Method
9. Significantly Bundled Activities Contract Method
10. Total Asset Management Contract Method
11. Alliance Contract Method
12. Kilometer (Mile) Per Month Contract Method
13. CREMA Contract Method

Menches and Chen: Innovative Maintenance Contracting Strategies
Definition of Contracting Strategy

Contracting Strategy

Delivery Method
- 13 Delivery Methods

Type of Specification
- 1. Method-Based
- 2. Performance-Based
- 3. Warranty

Pricing Strategy
- 1. Unit Price
- 2. Lump Sum
- 3. Cost Plus Fee

Menches and Chen: Innovative Maintenance Contracting Strategies
Provides guidance on the selection of an appropriate maintenance contracting strategy that will help DOTs achieve their maintenance goals and accommodate various circumstances.

1. Definition of the Delivery Method
2. Conditions for Appropriate Implementation
3. Selecting a Type of Specification
4. Pricing Strategy Options
5. Selecting an Award Strategy
6. Additional Information and Reference

Chapter 4 Contracting Strategy Selection Guide

4.1 Introduction to the Contracting Strategy Selection Guide

The purpose of this chapter is to provide guidance on the selection of an appropriate maintenance contracting strategy that will help DOTs achieve their maintenance goals and accommodate various circumstances. Each of the 13 maintenance contracting strategies is discussed based on six aspects:

1. Description of the delivery method
2. Conditions for appropriate implementation
3. Selecting the type of specification
4. Pricing strategy options
5. Selecting an award strategy
6. Additional information and references.

The chapter begins with general guidelines for selecting an appropriate contracting strategy and then discusses each of the 13 delivery methods.

The Maintenance Contracting Strategy Selection Framework (Chapter 3) identifies 13 delivery methods that are appropriate for individually-listed and bundled maintenance activities, including the bundling of nearly all maintenance activities. As shown previously in Figures 3.1 and 3.2, four delivery methods are appropriate for individually-listed maintenance activities, three are appropriate for bundling a moderate number of maintenance activities, and six are appropriate for bundling nearly all maintenance activities. One delivery method is appropriate for either individually-listed or moderately-bundled activities, and one delivery method is appropriate for either moderately-bundled or the bundling of nearly all maintenance activities. The framework also identifies three types of contract specifications and three pricing strategies that are widely used by Silos for maintenance contracting.

The definitions of the 13 delivery methods were presented in Chapter 2, along with Figure 3.1. Diagram of the 13 Innovative Maintenance Delivery Methods, which depicts the delivery methods that are appropriate for outsourcing individual, multiple, or nearly all maintenance activities. This information is repeated in Table 4.1. The definitions of the types of contract specifications, pricing strategies, and contract award strategies are related in Tables 4.2, 4.3, and 4.4 respectively.

These definitions are restated in this chapter so that readers can easily refer to this information as they review the guidelines for selecting an appropriate contracting strategy that will help them achieve their maintenance outsourcing goals.
Case Studies on Maintenance Contracting Strategies

11 Case Studies on 5 Maintenance Contracting Strategies — interviewed districts in TxDOT and other DOTs to identify their best practices, lessons learned, and implementation strategy

1. Activities Outsourced Using the Contracting Strategy
2. Description of the Contracting Strategy Investigated
3. Why this Contracting Strategy was Selected
4. Specific Criteria Used to Select this Contracting Strategy
5. How this Contracting Strategy was Implemented
6. Outcome Resulting from Implementation of this Strategy
7. Best Practices and Lessons Learned

Chapter 5 Case Studies on Innovative Maintenance Contracting Strategies

Table 5.1: List of TxDOT districts and respective delivery methods investigated

<table>
<thead>
<tr>
<th>TxDOT District</th>
<th>Delivery Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dallas</td>
<td>Total Asset Management Contract Method (also called Total Maintenance Contract)</td>
</tr>
<tr>
<td>Houston</td>
<td>Significantly Bundled Activities Contract Method (also called General Maintenance Contract)</td>
</tr>
<tr>
<td>Lubbock</td>
<td>Moderately Bundled Activities Contract Method</td>
</tr>
<tr>
<td>Lubbock</td>
<td>Jointly-Performed Maintenance Contract Method</td>
</tr>
<tr>
<td>Pharr</td>
<td>Moderately Bundled Activities Contract Method</td>
</tr>
<tr>
<td>Waco</td>
<td>Total Asset Management Contract Method (also called Total Maintenance Contract)</td>
</tr>
</tbody>
</table>

Table 5.2: List of other state DOTs and respective delivery methods investigated

<table>
<thead>
<tr>
<th>State DOT</th>
<th>Delivery Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Florida</td>
<td>Total Asset Management Contract Method (also called Asset Maintenance Contract)</td>
</tr>
<tr>
<td>North Carolina</td>
<td>Jointly-Performed Maintenance Contract Method</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>Moderately Bundled Activities Contract Method</td>
</tr>
<tr>
<td>Kentucky</td>
<td>Moderately Bundled Activities Contract Method (also called Hybrid Contract)</td>
</tr>
<tr>
<td>Maine</td>
<td>Long-term Separate Maintenance Contract Method</td>
</tr>
</tbody>
</table>

5.4. Case Study 1: Moderately Bundled Activities Contract Method

Using the moderately bundled maintenance activities contracting strategy, a few roadside maintenance activities on a specified highway and controlled access routes were set out together. The roadside maintenance activities typically covered in this contract include:

- Mowing
- Plant beds
- Fertilizer application
- Brush removal
- Litter control
- Cleaning drainage channel
- Hand sweeping of highways
- Hand sweeping of ADA ramps
- Guardrail maintenance is not included.

5.4.2. Description of the Contracting Strategy Investigated

Delivery Method: In a Moderately Bundled Activities Contract Method, a few maintenance activities that are of a similar nature and have a compatible sequence of work are let out together, such as mowing, sweeping, and litter pick-up.

Type of Contract Specifications: Method-Based

Pricing Strategy for this Contract Strategy: Unit Price

Contract Duration: Two years with a renewal option

Withdrawal Strategy: Low Bid

5.4.3. Why this Contracting Strategy was Selected

Lubbock District decided to bundle several individual roadside maintenance contracts into one contract to reduce the number of contracts it had to manage and to reduce overhead costs. The method enabled them to put their personnel mostly on pavement maintenance.

5.4.4. Specific Criteria Used to Select this Contracting Strategy

The following specific criteria were used by Lubbock District for selecting the Moderately Bundled Activities Contract Method for roadside maintenance:

Menches and Chen: Innovative Maintenance Contracting Strategies
Tool is a spreadsheet selection aid tool:

- **Step 1:** User selects type of activity(ies) to be outsourced: Individual, Bundled, or Nearly All Activities.
- **Step 2:** User must select the relevant outsourcing goals provided in the tool.
- **Step 3:** User must select the circumstances that are motivating them to outsource from a list in the tool.
- **Step 4:** Tool will recommend delivery methods that can help achieve outsourcing goals while accommodating circumstances.
Maintenance Contracting Strategy Selection Tool and Algorithm

Tool is a spreadsheet selection aid tool:

<table>
<thead>
<tr>
<th>No.</th>
<th>Outsourcing Goal</th>
<th>N/A</th>
<th>Low</th>
<th>Med</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>The DOT wants a long-term commitment from the contractor.</td>
<td>☐ N/A</td>
<td>☑ Low</td>
<td>☐ Med</td>
<td>☐ High</td>
</tr>
<tr>
<td>2</td>
<td>The DOT wants to reduce the amount of time for bidding and awarding projects.</td>
<td>☐ N/A</td>
<td>☐ Low</td>
<td>☐ Med</td>
<td>☑ High</td>
</tr>
<tr>
<td>3</td>
<td>The DOT wants to reduce contract administrative load by bundling activities together.</td>
<td>☐ N/A</td>
<td>☐ Low</td>
<td>☐ Med</td>
<td>☑ High</td>
</tr>
<tr>
<td>4</td>
<td>The DOT wants to reduce the coordination effort among multiple maintenance contractors.</td>
<td>☐ N/A</td>
<td>☐ Low</td>
<td>☑ Med</td>
<td>☑ High</td>
</tr>
</tbody>
</table>

**STEP 1**

**STEP 2**
Maintenance Contracting Strategy
Selection Tool and Algorithm

Tool is a spreadsheet selection aid tool:

**STEP 1**

- Individual Activity
- Bundled Activities
- Nearly All

**STEP 3**

<table>
<thead>
<tr>
<th>No.</th>
<th>Circumstances</th>
<th>check if applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>We were required to reduce our full-time employee (FTE) workforce, but we still have a significant amount of maintenance work to complete and not enough personnel.</td>
<td>✓</td>
</tr>
<tr>
<td>2</td>
<td>Budget limitations caused us to consider innovative contracting strategies that could help us complete required maintenance work at a reduced cost.</td>
<td>✓</td>
</tr>
<tr>
<td>3</td>
<td>We have some in-house personnel who can perform some of the work associated with a particular individual activity but they cannot complete all of the work.</td>
<td>✓</td>
</tr>
</tbody>
</table>

Menches and Chen: Innovative Maintenance Contracting Strategies
Maintenance Contracting Strategy Selection Tool and Algorithm

Tool is a spreadsheet selection aid tool:

- Individual Activity
- Bundled Activities
- Nearly All

**STEP 1**

**STEP 4**

Recommended Delivery Methods

- Highly recommend: Multi-Agency Contract Method
- Recommend: Long-term Separate Maintenance Contract
Algorithm is based on user input of maintenance goals and circumstances, then assignment of weights based on expert input.
Conclusions and Recommendations

**Identified 13 maintenance delivery methods**
- Several are not used in the U.S.
- Hence, need pilot studies to determine their utility in the U.S.

**Developed Maintenance Contracting Strategy Selection Framework**
- Decision process for selecting contracting strategies for various maintenance activities
- Not automated, but with larger research project, could be

**Developed Maintenance Contracting Strategy Selection Guide and Cases**
- Assists in selecting and implementing appropriate contracting strategies
- But, need case studies on all of the 13 strategies

**Developed Maintenance Contracting Strategy Selection Tool**
- Aids in selecting an appropriate contracting strategy to achieve maintenance goals
- Need much more extensive data collection from worldwide experts to populate the tool

*Menches and Chen: Innovative Maintenance Contracting Strategies*