A COMPARATIVE ANALYSIS OF CURRENT PERFORMANCE-BASED MAINTENANCE PROCUREMENT METHODS TO IMPROVE VIRGINIA HIGHWAYS

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Abstract

This research was completed in two phases; phase-one involved a mini-scan study of the highway maintenance industry to identify the current state-of-practice in performance-based maintenance contracting (PBMC). Phase one gathered information on domestic and foreign agencies currently using performance-based maintenance on highways. Phase two used the mini-scan study information to build, compare and analyze agency timelines (i.e., VDOT to others). Timelines included major milestones at each agency; milestones which enabled innovation in the field of performance-based contracting. The purpose of comparing VDOT to other agencies was to provide VDOT with industry best practices as well as recommendations for future contract evolutions. Timelines were constructed for Florida DOT, Main Roads of Western Australia, England’s Highways Agency and New Zealand Transport Agency. Connection links were made between VDOT and the other four agencies based on similarities in procurement laws and maintenance milestones (i.e., 1st Design-Build project). The timeline linkages and collection of information on benefits associated with PBMC (compared to traditional method-based maintenance) were used to make five recommendations for VDOT’s future maintenance program. VDOT recommendations were: Use performance-based contracting on secondary roads, use area-wide contracts to cover additional facilities, shift VDOT TAMS focus from lowest-cost to a best-value approach similar to England’s Managing-Agent Contractor, devise a strategic network of highways to prioritize maintenance, use key performance indicators to align Maintenance Division objectives with overall VDOT organization. Recommendations also considered the current restrictions imposed by Virginia procurement laws.
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I would also like to recognize my family and most importantly my mother, Victoria for giving me the foundation to succeed. Without her, I would not be where I am today. Through her loving, strong and persistent parenting, she has shown me the value of helping others and working hard to achieve success.
Virginia Department of Transportation’s Maintenance Division has been using innovative procurement strategies for their highway maintenance since the passing of the Public-Private Transportation Act (PPTA) in 1995 by the Virginia Legislature. The PPTA permitted private sector firms to submit unsolicited proposals to any “responsible entity” within the state including VDOT, to design, construct, finance, and operate transportation facilities (Gomez 2011). The public entity would then have the option to deliver the proposal or solicit its own proposals related to Public-Private-Partnerships (PPP). Following this legislation was the 2006 mandate of performance-based procurement strategies for interstate-highway maintenance. The 2006 strategic change is linked to the success of the first 10-year performance-based highway maintenance contract (1997-2007) was enabled by the PPTA. The pilot contractor maintained all interstate assets located within the fence-to-fence right-of-way on portions of the interstate (~250 miles). Cost savings were reported between $6.5 and $22 million dollars and LOS performance was better than expected (Gomez 2011). Since the pilot project and 2006 mandate, the Maintenance Division has launched a full performance-based maintenance program for interstates called “TAMS” (Turnkey Asset Maintenance Services).

As of 2012/2013, 13 TAMS contracts are being used to maintain Virginia’s interstates. These contracts have enabled to VDOT to realize increased cost savings and better levels of service (Hyman 2009); however, there are still areas for improving Virginia’s highways. According to Mr. Jose Gomez, P.E., Ph.D., Director of VDOT Innovation and Research, Virginia’s infrastructure still faces the following challenges as of 2011 (Gomez 2011):

- ~1,116 lane miles of interstate highways are in poor condition
- ~5,032 lane miles of primary highways are in poor condition
- ~27,166 lane miles of secondary roads are in poor condition (34% of the secondary system)
- 1,730 bridges are structurally deficient
- Approximately 4,600 structures are in danger of becoming structurally deficient in the next five years.
- An additional 2500 lane miles of roadway added to the system to maintain, along with an increase of 1.8 billion annual vehicle miles traveled (VMT) which causes more wear and tear on the system and increases the cost of traffic control for maintenance activities.

In lieu of the continued infrastructure maintenance challenges at VDOT, this research seeks to help VDOT identify and adapt industry practices to improve their current operations and maintenance program. In particular, the focus is on improving the effectiveness of the current TAMS contracts and their application within Virginia. Three objectives were formulated to set the framework for the research.

- Complete a mini-scan study of the highway maintenance industry to uncover current best practices.
- Gather information about VDOT maintenance program history, Virginia procurement laws and any related federal laws to be used for comparison with international highway agencies.
- Provide future contracting evolution recommendations for VDOT based upon industry best practices, similarities in evolution history to other agencies and current procurement climate in Virginia.

The research was completed in two phases; phase-one involved a mini-scan study of the highway maintenance industry to identify the current state-of-practice in performance-based maintenance contracting (PBMC). Phase one gathered information on domestic and foreign agencies currently using performance-based maintenance on highways. To narrow the scope of the research six agencies were chosen for information collection after reviewing industry reports such as NCHRP’s Synthesis 389, “Performance-Based Contracting for Maintenance”. The six agencies were: Main Roads of Western Australia, England’s Highways Agency, New Zealand Transport Agency, Florida Department of Transportation and North Carolina Department of Transportation. Collecting information on these six revealed three current innovative contracting strategies currently being used by operations and maintenance agencies:
(1) Use of a larger/diverse scope of services within the contract.
(2) Use of an integrated/collaborative project team (i.e., partnering).
(3) Use of a multi-faceted performance-monitoring framework (i.e., KPI’s).

In addition to the innovative strategies, a contracting matrix was devised to compare each of the six agencies to VDOT’s current TAMS contracts. The model TAMS contract used for comparison was the I-64 Culpepper TAMS let in 2010. The final contracting matrix can be found in Chapter #2.

Phase two used the mini-scan study information to build, compare and analyze agency timelines (i.e., VDOT to others). Timelines included major milestones at each agency that enabled evolutionary steps in the field of performance-based contracting. The purpose of comparing VDOT to other agencies was to provide VDOT with industry best practices as well as recommendations for future contract evolutions. Timelines were constructed for Florida DOT, Main Roads of Western Australia, England’s Highways Agency and New Zealand Transport Agency. TxDOT and NCDOT timelines were not made because both programs were using performance-based contracts at a much smaller level than VDOT. Agencies picked for timeline construction had been using performance maintenance methods for longer periods than VDOT and offered possible “next step” evolution ideas. Timeline connection links were made between VDOT and the other four agencies based on similarities in procurement laws and maintenance milestones (i.e., 1st Design-Build project). The timeline linkages and collection of information on benefits associated with PBMC (compared to traditional method-based maintenance) were used to make five recommendations for VDOT’s future maintenance program. Sample of timelines connections:

Figure 44 - Timeline Comparison Sample (From Report)
VDOT recommendations were:

Recommendation #1: Use performance-based contracting on secondary roads in Virginia. Based on timeline connections with Florida DOT’s downsizing initiatives and expansion with performance-based contracts, VDOT should begin expanding TAMS on smaller highways. Connections with New Zealand and Highways Agency in England also support VDOT expanding TAMS contracts. Both foreign agencies have successfully delivered performance-based contracts on smaller roads under procurement programs aimed at integrating the private sector with agency staff. VDOT’s recent “Blueprint” downsizing initiative and research studies on the secondary system indicate the shift is beginning to take place.

Recommendation #2: Use area-wide contracts to cover additional facilities enabling VDOT to become more of a strategic network manager and less of a service provider of maintenance works. Connection links were identified between VDOT and Western Australia, New Zealand and Florida DOT. These agencies have shifted their contracting portfolios to increased outsourcing via performance-based contracts as opposed to traditional method-based contracts. Recent VDOT budgetary consolidation efforts and strategic partnership initiatives at the Office of Public-Private Partnerships (OTP3) shows a trend taking place in Virginia towards the strategic mindset.

Recommendation #3: Devise a strategic network of highways to prioritize maintenance efforts and divide responsibilities between VDOT and localities. Timeline connections between current VDOT research efforts and Local Assistance Division programs linked to England’s Highways Agency and New Zealand. Both agencies had devolution statutes and local government programs enacted to help divide responsibilities among state and local agencies. In addition to recent VDOT devolution and research efforts, other Virginia agencies have investigated the idea of a strategic network of highways. Agencies include Virginia Center for Transportation Innovation and Virginia Office Intermodal Planning and Investment. This research recommends the Maintenance Division begin looking into these other Virginia agency reports to identify new highways for performance-based maintenance contracts. Challenges do however exist at VDOT with devolution of smaller highways because of transportation planning, contract management expertise and funding constraints. Other agencies that have experienced these same challenges and overcome them should be VDOT’s focus for best practice adoption.

Recommendation #4: Shift VDOT TAMS focus from lowest-cost to a best-value approach similar to England’s Managing-Agent Contractor program. The current VDOT contracts use a 2-Step “Invitation for Bid” process, which award contracts based on lowest bid. Current procurement laws mandate the lowest cost approach in Virginia for maintenance; however, the PPTA legislation in Virginia allowed VDOT to procure the pilot maintenance project under a best value system where price is only one deciding factor. VDOT should seek to transition back to a best value system (under the PPTA) which is used currently by many agencies using performance-based maintenance contracts. Agencies using the best-value system include England, Australia, New Zealand and others. Using this system could allow VDOT to integrate with a contractor/consultant team, which provides maintenance expertise for improving both short and long-term planning on the networks.

Recommendation #5: Use key performance indicators to align maintenance division objectives with overall VDOT organization. The maintenance division may want to use higher-level performance indicators related to network safety, environmental sustainability or overall network congestion to rate maintenance efforts on the highway. Other agencies studied devised performance indicators to help benchmark and monitor performance of contractors and their relationships with suppliers and agency staff. These indicators were linked to periodic payments as incentives and disincentives depending on yearly or quarterly performance. Using KPI’s in England within the MAC program has help dramatically reduce the KSI indicator on the network, which benchmarks crash rates. Using these types of indicators could help show contractors how their work directly influences the traveling public. These measures may also help upper level management in VDOT see how TAMS contracts promote the organizations overall safety and sustainability goals.
PLACE HOLDER PAGE for the 11X17 TRB POSTER.
Comparative Analysis of Current Performance-Based Maintenance Methods to Improve Virginia Highways

Joseph Arcella, Jesus M. de la Garza, PhD.
Virginia Tech
Vecellio Construction Engineering & Management Program

Introduction

**Agencies of Focus**
- Florida Department of Transportation (FLDOT)
- Virginia Department of Transportation (VDOT)
- Main Roads of Western Australia (MRWA)
- Highways Agency (UK)

**Objectives**
1. Complete a mini-scan study of the highway maintenance industry to uncover current best practices.
2. Gather information about VDOT maintenance history and Virginia procurement laws for comparison to other highway agencies.
3. Provide future contracting evolution recommendations for VDOT based upon industry best practices, similarities in evolution history (VDOT & other agencies) in addition to considering the current procurement climate.

Maintenance Evolution Timelines: VDOT & Virginia, FMRWA and Four Agencies

**Recommendations**

**VDOT Highway Maintenance**

**VDOT Recommendation #1**
Apply performance-based maintenance to the primary and secondary roads as well as other facilities.

Connections with VDOT history and downsizing.

New Zealand, England and Western Australia use PBMC on small sized highways.

**VDOT Recommendation #2**
Evolve maintenance role from a provider (self-performing) to a strategic network manager similar to Main Roads of Western Australia or England.

**VDOT Recommendation #3**
Devise a “strategic network” to determine an effective division of responsibilities between department & localities.

**VDOT Recommendation #4**
Shift the focus of maintenance delivery from “lowest cost” to “best value” by integrating the team with a pilot resembling the Managing Agent Contractor (MAC) program in the United Kingdom.

**References**

1. TAMS Work Area Assistance Services, VDOT Maintenance 2011-2012, 99-1
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List of Acronyms

AM – Asset Maintenance
ASSHTO - American Association of State Highway and Transportation Officials
DBB – Design-Bid Build
DBFO – Design-Build Finance Operate
FDOT – Florida Department of Transportation
FHWA – Federal Highway Administration
IPD – Integrated Project Delivery
ISA – Integrated Service Area
ISP – Integrated Service Provider
LOS – Level of Service
NCDOT – North Carolina Department of Transportation
NCHRP – National Cooperative Highway Research Program (NCHRP)
NZTA – New Zealand Transport Agency
PBMC – Performance-Based Maintenance Contracts
PMF – Project Management Firm
PPEA – Public-Private Educational Act
PPP – Public-Private Partnership
PPTA – Public-Private Transportation Act
PSMC – Performance-Specified Maintenance Contracts
TAMS – Turnkey Asset Maintenance Services
TMC – Total Maintenance Contract
TxDOT – Texas Department of Transportation
UK – United Kingdom
1 Thesis Introduction

1.1 Significance and Problem Statement

The term “Project Delivery Method” stands for a procurement system employed by an owner for the organizing and financing of services related to planning, design, construction, operation and maintenance of a given facility. Project delivery methods have adapted over the years in an attempt to meet and exceed the needs of owners in both the public and private sectors. The various delivery methods provide strategies for delegating responsibilities and risks among project stakeholders. The vast spectrum of methods ranges from traditional Design-Bid-Build (DBB) to newer innovative methods like Design-Build-Finance-Operate (DBFO) or Integrated Project Delivery (IPD). In recent years public sector agencies such as Departments of Transportation have begun utilizing newer delivery methods for their complex infrastructure projects. Traditional delivery schemes although still viable for infrastructure, are slowly becoming outdated due to economic instability in the 21st century. The traditional schemes tend to be less effective and efficient with regard to allocation of limited infrastructure funding compared to newer innovative methods. Allocation of limited funding is one of many issues at the focal point for agencies like the Virginia Department of Transportation and their Maintenance Division. Researching and discovering innovative procurement strategies has been, and will continue to be, an important part of the Maintenance Division.

VDOT’s Maintenance Division has been using innovative procurement strategies for their highway maintenance since the passing of the Public and Private Transportation Act (PPTA) in 1995 by the Virginia Legislature. The PPTA permitted private sector firms to submit proposals to any “responsible entity” within the state including VDOT, to design, construct, finance, and operate facilities (Hyman 2009). The public entity would then have the option to go forward with that proposal or solicit its own proposals related to Public-Private-Partnerships (PPP). Along with this legislation came the mandating of Performance-Based procurement strategies for highway maintenance. This strategic change can be traced to the apparent success of the first PPTA 10-year highway maintenance project in 1997 in which a contractor was responsible for the maintenance of all assets located within the fence-to-fence right-of-way. Cost savings for this initial pilot project were reported between $6.5 and $22 million dollars (Hyman 2009). Since the pilot project, the Maintenance Division has transformed performance-based maintenance of interstates into a full program known as the TAMS (Turnkey Asset Maintenance Services). As of 2012, there are 13 performance-based maintenance contracts covering the entire interstate system in Virginia.

The current VDOT TAMS program has addressed many critical maintenance needs since its inception in 1997; however, Virginia’s infrastructure remains critical and is in need of newer solutions (critical = sub-par road conditions). The infrastructure is aging rapidly and continues to demand greater levels of maintenance resources to ensure public safety. According to Mr. Jose Gomez, P.E., Ph.D., Director of VDOT Innovation and Research, Virginia’s infrastructure is facing the following challenges in 2011 (Gomez 2011):

- ~1,116 lane miles of interstate highways are in poor condition
- ~5,032 lane miles of primary highways are in poor condition
- ~27,166 lane miles of secondary roads are in poor condition (34% of the secondary system)
- 1,730 bridges are structurally deficient
- Approximately 4,600 structures are in danger of becoming structurally deficient in the next five years.
- An additional 2500 lane miles of roadway, which have been added to the system need to be maintained, along with an increase of 1.8 billion annual vehicle miles traveled (VMT) which causes more wear and tear on the system and increases the cost of traffic control for maintenance activities.

These conditions will continue to worsen in subsequent years if proper action is not taken to maintain the critical infrastructure. As global markets continue to become uneasy in the wake of financial crisis and funding sources are less stable, VDOT will need to search for innovative maintenance procurement solutions to help raise asset service levels. Innovative solutions will have to bring together the public and private sector for the common interest of protecting public safety and upholding fiscal responsibility.
The industry trend in highway maintenance is undoubtedly moving towards a contracting style that enables agencies to outsource higher volumes of work. Outsourcing results have shown reduced costs, increased service levels and improved customer relations with the traveling public (Pakkala 2007). New and innovative contracting methodologies have the ability to better promote self-regulation on the part of contractors as well as agencies and any third party consultants. New styles of contracting such as performance-based maintenance contracting aim to distribute risks more efficiently by allowing contractors to choose their own means and methods as opposed to older contracting styles. Collaborative contracting efforts such as partnering and alliancing have risen within this new contracting style. Increased collaborative efforts have enabled parties to construct clearer and more concise contracts in addition to performance targets. In return, all parties will benefit when the risks are effectively allocated and each stakeholder knows their role throughout each phase of the project. As with all new technologies and ways of doing business, there will be critics reluctant to change and discrepancies within cost savings and service level results of the newer styles. Yes, there are instances where performance-based contracting for maintenance needs further research and examination; however, the future looks promising for performance-based contracting within the highway maintenance industry. Industry organizations (TRB, FHWA, AMOTIA) and leading professionals in the field have reported increased usage of the performance-based approach compared to traditional method-based contracting for highway maintenance (Hyman 2009).

The innovative “Performance-Based” highway maintenance system is characterized as long-term, comprehensive, and target-driven, while traditional highway maintenance is short-term, piece-meal, and means-based with little or no room for innovation from the private sector. The use of performance-based contracting serves as an important piece to an alternative procurement strategy that can yield both cost savings and increased service levels (Hyman 2009). Performance-based methods also allow the contractor to innovate and work closer with the highway agency funding the project. Researching and comparing new and innovative procurement strategies that employ performance-based approaches to managing contractors will benefit VDOT’s growing infrastructure demands from population growth and urbanization.

Based upon the complex issues facing Virginia’s infrastructure, this research assesses whether it make sense for VDOT to explore maintenance strategies currently in use by other agencies dealing with the very same infrastructure challenges.

1.2 Performance-Based vs. Traditional contracting

This section provides a brief review of background information on concepts related to performance-based contracting. The section also provides a better understanding of this research project for those new to the topic.

Traditional methods of highway maintenance are focused on using in-house resources for delivering asset maintenance. If the demands are too great, the work is contracted to the private sector under a traditional contracting approach. The traditional contracting approach hinges on the use of predominately method-based specifications. Method-based specifications allow road agencies to have control over what materials are used and how they are used for maintaining assets. In addition to control of materials, this type of specification gives the agency greater control over the products final quality (Menches, 2010). The down side to traditional contracting is that it places a large burden on the agency to maintain the necessary staff and equipment levels needed for monitoring the contractor’s upkeep of the road network. In recent years, tightening budgetary constraints have taken hold on both domestic and foreign agencies, forcing them to find more economical ways of doing maintenance work. The hope with implementing new alternative and innovative contracting strategies is to not only save money but to bring about better collaboration, heightened innovation and improved levels of service to the traveling public. Agencies are also in need of contracts, which allocate risks more effectively amongst stakeholders. Allocation of risk must be laid upon the party best able to manage that risk. Realizing the urgency of these many needs have sparked agencies to fund researching projects devoted to learning more about alternative contracting methods. Learning from other industries such as manufacturing and oil and gas has prompted highway agencies to experiment with performance-based contracting methods.

Performance-based contracting delivery methods are an innovative way to maintain complex road networks with limited in-house resources. The main difference with performance-based contracting is its use of performance-
based specifications instead of a method-based approach. These performance specifications allow contractors to become self-regulated to a greater degree than traditional contracts because they themselves are in charge of the materials as well as means and methods associated with the work; not the agency. The contractor must regulate how often it must maintain assets and deploy crews to areas of need. Table 1 is an example of performance-based specifications from a VDOT Maintenance contract.

Performance-based specifications specify the desired outcome but do not tell the contractor how to go about reaching the outcome. For example, Table 1 tells the contractor all desired outcomes for road conditions related to brush and tree maintenance. VDOT does not focus on how the contractor attains these outcomes as long as the specified targets are acquired. In method-based specifications, the language would be different, dictating the types of tools and brush control equipment the contractor has to use. Any other methods not specifically named by the agency would be a breach of contract unless approved by the licensed engineer.

The performance specifications enable the highway agency to focus on mainly contract administration and inspections of maintenance. Gaining a clearer focus enables the agency to sharpen its agenda and contribute to the overall organizations’ desired objectives (i.e., Quality and Customer Satisfaction). Performance-based maintenance contracting provides a more focused approach and aligns both private and public entities on the end goal: higher quality and safer maintenance services.

There are many different agencies currently using variations of performance-based contracting both domestically and aboard. Department of Transportation’s such as VDOT, FDOT and TXDOT have been applying performance-based contracts to some of their road networks since the mid to late 1990s (Hyman 2009). Other DOTs are beginning to experiment with this style and are at various transitional phases between the traditional and performance approaches. An example of a transitional agency is the North Carolina Department of Transportation (NCDOT), a performance-based contracting user since 2007 (Menches 2010). NCDOT is very new to the area of performance-based contracting and is looking to expand their program after viewing the positive outcomes of agencies like VDOT and TxDOT. The more experienced users of performance-based contracting here in the USA are VDOT, FDOT, and TxDOT. More experienced in terms of years spent delivering performance-based maintenance contracts. These agencies will be the primary focus in this research proposal from the domestic agency side. NCDOT, FDOT and TxDOT contracts are all structured differently with varying percentages of method-based specifications included in the overall performance-based style contract. Pure performance-based contracts are not common in the USA; however, international agencies such as England and Australia use contracts, which are 100% outcome based. USA agencies prefer to retain some level of control during the maintenance delivery process.

The idea for the change in contracting strategy in the U.S.A. stems from positive experiences realized by highway agencies abroad. Agencies in Table 2 currently retain no in-house resources (equipment) and contract out either all or nearly all of their maintenance work. These agencies are committed to performance-based contracting.

Table 1 - Sample VDOT Maintenance performance-based specifications (eVA 2012) used with permission by VDOT

<table>
<thead>
<tr>
<th>Brush and Trees</th>
<th>MRP Requirements:</th>
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<tr>
<td>Unobstructed sight distance</td>
<td>• No trees or brush affecting sight distance or clear zone of VDOT property</td>
</tr>
<tr>
<td>Vertical clearance</td>
<td>• Vertical clearance of 20’ over roadway (includes shoulders).</td>
</tr>
<tr>
<td>Structure inspection &amp; repairs unobstructed</td>
<td>• Vertical clearance of 7’ over sidewalks.</td>
</tr>
<tr>
<td>Proper notification shall be provided to local owners before pruning trees</td>
<td>• No live, leaning or dead trees that present a hazard.</td>
</tr>
<tr>
<td></td>
<td>• A “hazardous tree” is a tree with structural defects likely to cause failure of all or part of the tree, which could strike a roadway, paved shoulder, bridge, or overhead sign structure.</td>
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<tr>
<td></td>
<td>• Horizontal clearance of 15’ on each side of structures for its entire length</td>
</tr>
<tr>
<td></td>
<td>• Vertical clearance of 15’ under the entire length of structures</td>
</tr>
<tr>
<td></td>
<td><strong>Timeliness Requirement:</strong></td>
</tr>
<tr>
<td></td>
<td>• Trees/brush affecting sight distance to regulatory signs and/or creating safety hazard shall be removed within 48 hours of notification or discovery.</td>
</tr>
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for highway maintenance and have seen increasing cost savings and higher levels of efficiency compared to traditional outsourcing:

Table 2 - International Agencies (Retain No In-house Resources) (Pakkala 2007)

<table>
<thead>
<tr>
<th>Western Australia</th>
<th>England</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta, Canada</td>
<td>Norway</td>
</tr>
<tr>
<td>British Columbia, Canada</td>
<td>Finland</td>
</tr>
<tr>
<td>Ontario, Canada</td>
<td>New Zealand</td>
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<tr>
<td>The Netherlands</td>
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</table>

Choosing the right variation of performance-based contracting depends on an agency’s level of experience with the contracting style. Agencies with little or no experience may want to first outsource a single activity such as a periodic or routine maintenance activity. A routine maintenance activity is one that needs attention on a continuous basis. Activities that classify as routine include but are not limited to pothole repair, vegetation control, trash removal, winter maintenance (snow removal). A periodic maintenance activity differs in that it occurs less frequently and often is associated with major improvement activities such as bridge rehabilitation or resurfacing (Pakkala 2007). Outsourcing a single activity serves as a first step or “pilot” project for the inexperienced agency. This allows the agency to test out the new method rather than investing in an entire program. This first step (piloting) allows the agency to judge whether it can handle its new role as client rather than producer within the asset maintenance industry (Pakkala 2007). Cost analysis can also be done between in-house and outsourced crews with this “pilot” project to determine its monetary implications. On the other hand, agencies who have had previous experience with performance-based contracting could try outsourcing multiple activities in both routine and periodic maintenance. As experience with performance-based contracting is gained, the agencies will learn what variation works best for their road network and budgetary constraints. Collecting and learning about agency history and experiences with performance-based contracting is a common practice between international agencies listed in Table 2. The notion of sharing best practices and tailoring them to meet a country’s particular infrastructure need is commonplace in the international arena (Pakkala 2007). This thesis proceeds to mimic the process of best practice identification for adoption and adaptation by applying it to the Virginia Department of Transportation maintenance program. The collection of agency best practices and evolution history began with a mini scan study serving as the point of departure for this thesis. The scan study serves as the background and literature review for the thesis and was conducted between January 2010 – August 2011. The next section will detail the thesis objectives, which set the direction this research.

1.3 Thesis Objectives

This thesis aims to help VDOT’s Maintenance Division identify new avenues for using performance-based maintenance contracting. Identifying best practices and agency evolution of other transportation authorities will help VDOT choose the next step in maintenance contracting evolution.

Identifying and adopting new performance-based maintenance strategies could potentially assist VDOT with managing maintenance demands and ensuring infrastructure stability (i.e., bridges, highways). This thesis consists of three main objectives:

- Complete a mini-scan study of the highway maintenance industry to uncover current best practices.
- Gather information about VDOT maintenance program history and Virginia procurement laws and compare to other highway agencies.
- Provide future contracting evolution recommendations for VDOT based upon industry best practices, similarities in evolution history (VDOT & other agencies) as well as current procurement climate.
Recommendations for VDOT will be made based upon similarities between their contracting program and the six agencies studied during the mini scan study for maintenance best practices (January 2010 – August 2011).

1.4 Thesis Methodology

The thesis methodology includes a five-step process (Figure 1) to accomplish the three thesis objectives set out in section 1.3.

Figure 1 - Thesis Methodology

Task #1: A literature review on alternative highway maintenance procurement strategies was conducted. Domestic and foreign agencies were researched to gather information in order to identify the current state of practice with performance-based highway maintenance. The mini-scan study produced a final contracting matrix comparing six highway agencies (England, W. Australia, New Zealand, TxDOT, NCDOT, FDOT) and VDOT. The study also produced three major contracting strategies/best practices that summarize the current state of practice. Chapter two discusses the major three strategies found from the mini-scan study.

Task #2: Using the mini-scan study information as well as new information from a variety of Virginia sources a maintenance contracting and Virginia procurement law timeline was made. The timeline made included evolution steps within VDOT’s current interstate maintenance contracts as well as any applicable Virginia procurement law milestones. This step involved researching both Virginia state-level and US federal-level procurement laws regarding construction and maintenance contracting. Timelines can be seen in Chapters 6 thru 8.
Task #3: Using information collected over the course of the mini scan study (January 2010 – August 2011), four timelines were put together: FDOT, Western Australia, England and New Zealand. The other two agencies studied, TxDOT and NCDOT will not be used for timeline construction because their performance-based maintenance programs are relatively small compared to VDOT’s state-wide program. TxDOT and NCDOT do not have performance-based contracts spanning the entire state and the types of contracts in use have considerably more method-based specifications than a VDOT contract. The purpose of forming timelines is to understand contracting evolutions of other agencies farther along than VDOT with respect to implementing performance-based maintenance programs. Identifying similarities between VDOT’s contracting history and more advanced programs may provide future projections for VDOT advancement.

Task #4: Comparing VDOT’s evolution to the four agencies (FDOT, Western Australia, England, New Zealand) was used to identify similarities in procurement laws and contract styles. For example, VDOT’s first performance-based contract for highway maintenance came in 1997. The push for this maintenance innovation came in response to the 1996 passing of the Public-Private Transportation Act (PPTA), allowing privatization of transportation assets. This state-level procurement event and resulting action by VDOT is similar to England’s Private Finance Initiative (PFI) in 1994, which led to England reforming their highway maintenance contracts in middle 90’s under the Highways Agency (VDOT equivalent agency). This type of pattern identification between agencies is the main goal of this task. Identifying patterns is important for learning where England has evolved from compared to VDOT in addition to learning why particular advancements in England have not happened in Virginia.

Task #5: The final step was to identify potential avenues for VDOT’s maintenance contracting advancement. The recommendations are based on the similarities identified between VDOT and the other four agency timelines. Recommendations also include potential barriers to implementation of any new contracting concepts depending on the procurement climate in Virginia. For example, are particular infrastructure assets permitted for privatization? Does VDOT see a need to outsource particular assets even if they have the ability to do so? These are all important considerations discussed in this thesis.

1.5 Expected Outcomes and Impacts

This research will identify industry best practices and contracting methods that could help VDOT’s Maintenance Division. The current Virginia procurement law environment may however prevent such contracting changing from taking place. It is expected that some contracting modifications and best practices may not be possible due to these procurement “barriers”. Procurement law barriers preventing change will be part of the timeline analysis and future recommendations for VDOT maintenance.

This thesis will raise awareness about similarities between VDOT and other highways agencies in an attempt to help VDOT evolve their current maintenance program. Raising awareness about newer innovative methods will help improve the value VDOT brings to the traveling public. The research will also raise awareness about collaborative working agreements between public and private entities.

1.6 Thesis Structure

- Chapter #1 – Thesis Introduction
- Chapter #2 – Mini-Scan Study on Performance-Based Maintenance Contracting
- Chapter #3 – North Carolina Department of Transportation
- Chapter #4 – Texas Department of Transportation
- Chapter #5 – Florida Department of Transportation
- Chapter #6 – Main Roads of Western Australia
- Chapter #7 – England’s Highways Agency
- Chapter #8 – New Zealand Transport Agency
- Chapter #9 – The VDOT Experience
2 Mini-Scan Study on Performance-Based Maintenance Contracting

This chapter will discuss the approach used to collect information on the current state of practice in the performance-based maintenance industry for highways. In particular, this chapter will discuss the methods used to scan the industry looking for agencies and why six agencies were chosen for a focused collection effort. This chapter will present the major outcomes and best practices currently being used by the six agencies of focus, which serve as good representatives for the wide spectrum of performance-based contracting industry.

2.1 Scan Study – Scope and Objectives

The scope of this study was to uncover new and innovative alternative highway maintenance procurement strategies used by domestic and international transportation agencies. Learning about six various agencies currently using performance-based maintenance contracting enabled a comparison to VDOT’s Turnkey Asset Maintenance Services (TAMS) contracts. The objectives for this mini-scan study were the following:

- Uncover a variety of maintenance strategies used by various highways agencies across the globe.
- Compare and contrast (qualitative comparative analysis) maintenance strategies to help update VDOT maintenance division on the current state-of-practice within performance-based contracting.
- Compile contract documents and resources for future researching efforts on performance-based contracting for maintenance.

2.2 Scan Study - Approach & Agencies of Focus

To accomplish the mini-scan study objectives a five-step approach (Figure 2) was constructed to collect information.

1. Investigate performance-based contracts currently in practice.
2. Examine current VDOT performance-based contracts.
3. Determine the main targets that VDOT is aiming for in performance-based contracts.
4. Choose agencies for matrix comparison and devise performance parameters to compare across various agencies.
5. Recommend the strategies that best fit VDOT’s goals.

Figure 2 - Mini-Scan Study Methodology
**Task #1:** The approach begins with scanning industry reports from agencies involved with current researching initiatives in performance-based maintenance contracting. The Transportation Research Board (TRB) provided crucial reports on the current state-of-practice. TRB’s NCHRP Synthesis 389, “Performance-Based Contracting for Maintenance” was one of these reports which reviewed both international and domestic experiences with performance methods.

**Task #2:** Due to a wealth of information on the subject, it was agreed upon by Dr. de la Garza and I to first review current VDOT Turnkey Asset Maintenance Services (TAMS) contracts. Reviewing TAMS contracts before collecting specific information on the six agencies helped identify specific areas of interest within the VDOT performance-based TAMS program. For example, if VDOT maintenance contracts put high priority on snow removal and de-icing operations then information on this topic would be searched while reviewing other highway maintenance agencies. The purpose of this strategy is to uncover how other agencies perform this maintenance operation, in the hope of identifying best practices for possible VDOT adoption. The new revamped TAMS contract for I-64 Culpeper was chosen as the representative contract for review. The I-64 Culpeper contract used in this scan study and subsequent thesis serves as the “model” TAMS contract signifying the current state-of-practice at VDOT.

**Task #3:** After scanning the I-64 contract a survey was put together for VDOT staff asking about their interest level related to various contracting aspects such as Traffic Operations or Third Party claims procedures.

The 42-question survey in step three of the scan study guided information collection and was structured as follows: “Would you like to learn more about XYZ”. The topics for all survey questions originated from the I-64 Culpepper RFP. Topics such as “Emergency Management” and “Traffic Operations” were some of the themes reoccurring in the RFP and included in the survey. The survey respondent, Clinton Simpson (VDOT Maintenance, Richmond, VA) ranked each question based on level of importance. There were three possible levels to choose from for ranking each question. A question ranked as (1) would mean VDOT is not interested at all in learning more about the given topic, (2) somewhat and (3) being very interested to learn more. This survey was simple yet enabled the research to focus on contracting principles relevant to VDOT. Of the 42 topics proposed only 17 were deemed significant by VDOT (given a two or three) for further investigation. To control the scope of this scan study three overarching topic areas were formulated from the 17 topics deemed important. Overall themes were developed from the 17 questions, which lead to the three topic areas for research and information collection. Table 3 shows how the 17 questions were grouped into three main topic areas.

<table>
<thead>
<tr>
<th>Topic Area</th>
<th>Grouping of 17 Questions to support each Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Area #1 –</strong></td>
<td>(Questions deemed significant by VDOT Maintenance staff for scan study.)</td>
</tr>
<tr>
<td><strong>What is the scope of services required by contract to fulfill the highway agencies business objectives and desired outcomes?</strong></td>
<td>✓ New and innovative contracting structures such as the New Engineering Contract? ✓ Contractor maintenance activities to be performed under the contract for the assets included under in the contract? ✓ Documentation and relevant procedures for repairs/replacements of assets such as pavement? ✓ Contractor responsibilities/procedures for emergency response services? ✓ Contractor responsibilities/procedures for snow and ice control services? ✓ Contractor responsibilities/procedures for operations, safety management and traffic control services? ✓ Contractor responsibilities/procedures for customer service and incidental services? ✓ Dispute and claims resolution procedures? ✓ Policies/procedures for Third Party and Tort/Damage Claims?</td>
</tr>
</tbody>
</table>
Area #2 -
How is the performance of professional services and works measured and assessed through the particular maintenance program?

- How contractor performance is assessed and measured?
- Learn more about other state DOT’s that use Maintenance Rating Programs?
- Performance standards and relevant measures commonly used to address performance-based contract delivery for different types of maintenance activities?
- Policies and procedures for handling contractor performance criteria failures?
- How performance levels are established, measured, and evaluated in maintenance contracting?

Area #3 –
What are the reported benefits of using performance-based contracting as opposed to traditional contracting methods? (Include Data on LOS fluctuations, Cost savings + any charts gathered etc.)

- The reported changes in levels of service after performance-based contract implementation?
- Would you like model contract documents from other highway agency programs to be included in the final report?
- Reported costs, risks, and possible shortcomings of adopting performance-based maintenance contracts over traditional method-based maintenance contracts?

Task #4: After completing the survey, performance parameters were formulated under each of the three topic areas for use in a matrix comparing VDOT TAMS contracts to other agency contracts. In addition, a collection of agencies was selected for comparing with VDOT. After gaining a good sense of the industry players in performance-based contracting from task one, six agencies were selected for further investigation. The in-depth investigation on each of the six agencies aimed to collect maintenance program history as well as how each of the six highway maintenance programs are currently operating. The three topic areas developed were the guiding principles for collecting information on the six agencies. The six highway agencies chosen were:

**Three Domestic:**
- North Carolina Department of Transportation (NCDOT) – Pilot project contracts (Charlotte Area)
- Texas Department of Transportation (TxDOT) – Total Maintenance contracts
- Florida Department of Transportation (FDOT) – Asset Maintenance (AM) contracts

**Three International:**
- Main Roads of Western Australia (MRWA) – Term Network & Integrated Services Arrangements
- England’s Highways Agency (HA) – Managing Agent Contractor (MAC) program
- New Zealand Transport Agency (NZTA) – Performance-Specified Maintenance Contracts (PSMCs)

Focusing on only six agencies enabled this project to dig deeper into the contracting framework used by each. Using an equal number of foreign and domestic agencies was intended to provide a holistic look at the current state-of-practice. These six agencies also vary across the spectrum of experience-level with performance-based contracting. For example, NCDOT is new to the implementation of this contracting approach while England’s Highway Agency (HA) is an established leader in highway maintenance. The other four agencies range between the two; both in experience and implementation level. Most importantly, each of the six agencies offers a unique
perspective on performance-based contracting which could potentially assist VDOT maintenance endeavors. To reiterate from the previous section, the three main topic areas chosen for collecting data on each of the six highway agencies were:

- Area #1: What is the scope of services required by contract to fulfill the highway agencies’ business objectives and desired outcomes?
- Area #2: How is the performance of professional services and works measured and assessed through the particular maintenance program?
- Area #3: What are the reported benefits with using performance-based contracting as opposed to traditional contracting methods? (Includes any data on LOS fluctuations, Cost savings + any charts gathered, etc.)

Information for each area was collected from a variety of sources including scholarly reports, agency web pages and personnel interviews with current professionals. For example, information under Area #2 would be learning about how performance evaluations are conducted (forms or assets monitored) and at what frequency; two or three times per year. This mini-scan study includes numerous model contract documents collected to aide in learning about each agency. To bring the information together a final contracting comparison matrix was formulated to compare contracting programs. The matrix contains some of the main highlights from each of the six agencies (For example contract duration and lane-miles in each contract). Contract highlights were deemed “performance parameters” and classified under each of the three topic areas. For example, under Area #1 a “performance parameter” for side-by-side comparison would be “Traffic Operations” (Yes or No) within the scope of services. Some agencies choose to include this work item while others did not. It is important to note that an exact one-one relationship with information should not be assumed for some performance parameters due to the variable nature of the data across agencies. Each of the six agencies employs different methodologies for calculating information such as cost savings or level of service. The side-by-side presentation is used merely to display the variety of results among contracting styles in the industry. This matrix aims to clearly and concisely present the most important conclusions to VDOT Maintenance Division (scan study sponsor).

Task #5: The final step of the approach looked at the different agencies and decided what common industry trends and best practices are currently in use within the maintenance community. Section 2.4 will cover the major outcomes and industry trends discovered during the scan study on each of the six agencies. These outcomes were recommended to VDOT in the scan study final report submitted in September 2011 to the Maintenance Division. The scan study final report serves as the literature review for this research.

2.3 Industry Reports: Performance-Based Maintenance Contracting

Prior to focusing on the six highway agencies reported in the scan study there was a broad scan for scholarly reports on performance-based contracting (i.e., Task #1). The following four reports were the most influential for starting and completing the scan study. These reports continued to provide new avenues for information while putting together the overall thesis. Sections 2.3.1 through 2.3.4 will briefly review these reports as well as discuss why they are important to this research and the overall industry of highway maintenance.

2.3.1 NCHRP Synthesis 389 “Performance-Based Contracting for Maintenance” by Transportation Research Board (2009)

This synthesis study discusses industry evidence that using performance-based maintenance contracting (PBMC) yields better results than traditional method-based contracting (better outcomes, lower costs, less public entity risk and more financial predictability) (Hyman 2009). NCHRP survey numerous domestic agencies and Canadian provinces about their involvement with performance-based methods. The results showed a growth in usage and variety of performance-based contract by various state agencies. Table 4 and Table 5 show some of the
survey results from the NCHRP study. The evidence also suggests that when an agency first implements a performance-based maintenance contract (PBMC), the service levels tend to decrease; however, over time, service rises above pre-PBMC levels. This can be attributed to contractors and a “learning curve” for developing an effective method for maintaining their assigned road network. This “learning curve” response with service levels is common if the local contracting market is unfamiliar with performance-based contracts. Agencies new to the field of performance-based contracting should pay close attention to the level of contracting experience in their respective area before enacting any new contracting styles and methods. An example of the “learning curve” effect took place within the first two TxDOT performance-based contracts let in 1999. The first contract was for 120 centerline miles of I-35 in the Waco District and the other was for 60 centerline miles of I-20 in the Dallas District. The following assets and operations were addressed in the contracts: pavements, bridges, roadsides, traffic operations, traffic services, incident response, hazardous materials clean up, and emergency repairs. These projects turned out to be a success despite the initial drop in service levels as mentioned. Upper management noticed the higher levels of service that resulted after the initial decline and requested that many more contracts be let in this fashion. TxDOT’s involvement with performance-based contracting is discussed in the NCHRP report and will be discussed in Chapter 4 of this thesis.

The report notes that some agencies are skeptical of the potential savings from outsourced work. Skeptics claim that there is difficulty when comparing public and private costs associated with maintenance. The cost comparisons are said to be on “unequal” footings and should be examined very carefully. The cost discrepancy stems from the variations in direct and indirect costs incurred by in-house and outsourced crews.

Table 4 - NCHRP Survey Results (#1) (Hyman 2009) used with permission by TRB
The researchers in the NCHRP report did not send surveys to international agencies; instead, there was a comprehensive literature review of foreign agencies to uncover information. Cost savings was an important topic as mentioned earlier and has been seen by many foreign agencies using PBMC. Table 6 on the next page shows the cost savings for foreign agencies and the United States.
Another key element of the NCHRP 389 report is that it incorporates a wealth of references for future research. For example, Appendix B of the synthesis report entitled “Sample Procurement and Contract Documents” and Appendix C entitled “Evidence on Changes in Levels of Service and Cost Savings” were helpful for this research and can inform others looking to peruse various routes in performance-based contracting. The NCHRP report helped identify TxDOT and FDOT as ideal for studying their maintenance programs in this thesis. Both agencies have a high-level of usage compared to other USA DOT’s. Here are some of the major discussion points in the NCHRP report, which benefit this research:

- Allocation of Risks
- Maintenance Quality Assurance
- Contractor Selection Criteria
- Monitoring and Evaluation of Contractor
- Training

2.3.2 “International Overview of Innovative Contracting Practices for Roads” by Finnish Road Administration (2007)

The Finnish Road Administration echoes the NCHRP report in detailing how agencies are turning towards performance contracting methods for effective project delivery. The distinct difference between the two reports is that the Finnish Road Administration separates its report into two main sections, capital investment projects and maintenance-only projects. The capital investment section is unique in that it discusses the increasing usage of
various procurement models for new road projects. The traditional design-bid-build is being replaced with methods such as design-build-finance-operate (DBFO) and other public-private agreements. The following list of delivery methods are outlined in the report (Pakkala et al. 2007):

- Design-Bid-Build (D-B-B)
- Design-Build (DB)
- Construction Management (CM At-Fee) - Rare
- Construction Management (CM At-Risk) - Rare
- Design-Build-Operate (DBO) or Design-Build-Operate-Maintain (DBOM) - Rare
- Design-Build-Finance-Operate (DBFO)
- Build Operate Transfer (BOT) & Build Own Operate Transfer (BOOT)
- Early Contractor Involvement (ECI)
- New – “Alliance model”

In addition to the focus on new capital investments, the report has a larger focus on agencies abroad using performance-based maintenance contracting compared to the NCHRP 389 report. For example, highway agencies such as England are currently using the “Alliance model” for performance contracting. This model awards the contract based on technical score only. The price is later worked out as a fixed price with a percentage fee. The hope with this new model is for higher amounts of collaboration between owner and contractor (Pakkala et al. 2007). The section on “Alliancing” was very helpful for this research project since three of six (Western Australia, England and New Zealand) agencies in the report are incorporating this type of model for highway maintenance.

The Finnish Road Administration put together numerous graphical aids in this report for both the capital investment and maintenance project sections. The maintenance section has a large matrix, which shows agency performance-based contract styles side-by-side. Exhibit A.1 in Appendix A shows this large matrix. Contracts are compared by:

- Contract Type
- Contract Duration
- Contractor Selection Criteria
- Activities Included (Basic overview)

Exhibit A.1 was one of the major contributing factors to the layout of the final matrix in this report from the mini-scan study. Seeing maintenance programs side-by-side in matrix format allows the variations to be seen much easier.

2.3.3 “Synthesis Study on Innovative Contract Techniques for Routine and Preventive Maintenance Contracts” by Center for Transportation Research, University of Texas at Austin (2010)

This report (Menches et al. 2010) echoes the first two regarding the growing need to explore innovative contracting strategies for highway maintenance. The harsh economic climate and increasing budgetary constraints makes maintaining existing roadways a daunting task. The new way of contracting is becoming increasingly focused on outsourcing to the private sector. The move to a greater percentage of outsourced work aims to increase cost savings, efficacy levels and promote better solutions to existing problems in relation to traditional methods as mentioned previously. To assist agencies in implementing performance-based contracting, the author presents two important results within the report:

- Set of classifications to assist learning various styles of performance-based contracting; and
- Decision making flowchart for choosing the best contracting method.
The article outlines the 13 major performance-based contracting methods that are currently being used throughout industry (Menches et al. 2010). The method best suited for a particular agency or firm depends on their experiences with performance-based contracting. Some methods involve outsourcing only one activity as a “test pilot” while others methods outsource numerous activities. Exhibit A.2 in appendix A shows the grouping of the 13 contracting methods in a “family tree” format and how each method falls under a broader classification. For example, the “Framework Contract Method” is under both “Single Activity” and “Bundled Activities” classifications; this means that the “Framework Contract Method” is suitable for outsourcing projects that have one or many activities (Menches et al. 2010). The 13 contracting methods are summarized below. Each method is explained based on characteristics such as average contract duration used and type of specification preferred under the respective method. The summaries were compiled using chapter 4 of the report (Menches et al. 2010):

1. **Individual Activity Contract Method**: Only one maintenance activity is outsourced to a contractor, who performs all of the work associated with that activity. The contract duration for this method ranges from one to two years. Implementation is recommended for agencies new to the performance-based maintenance contracting (PBMC) system and allows the agency to experiment with a pilot test. If the activity chosen is thought to be risky, a warranty based specification is encouraged; however a method-based specification is better for an activity which lacks clear performance criteria.

2. **Jointly-Performed Maintenance Contract Method**: This method is for activities that are too large for in-house resources to handle. The contract method outsources a portion of the work to the contractor who can pick-up the remainder of the work. This method is ideal for periodic maintenance (ex. milling and overlays), emergencies, severe weather or time constraints. The usage of a method-based specification helps keep both in-house and contractor crews following the same standards. Performance specifications can also be used as way to promote competition and increase efficiency. Warranty specifications are not recommended, since the contractor will not want to guarantee work performed by the in-house resources.

3. **Long-term Separate Maintenance Contract Method**: This method as the name implies is used for a period of time greater than 5 years. Longer durations allow the contactor to gain a return on investment if the equipment for the job is costly. Under this method, one activity is contracted out due to its wide spread area or remote location. This helps the SHA with activities that are considered risky or outside their core of expertise. For example, outsourcing the maintenance of all rest areas, all bridges and even herbicide treatment in a particular state. Method-based specifications are recommended for tasks such as milling and overlay or other specialized work. Performance-based specifications are recommended for activities that are far apart (rest areas).

4. **Framework Contract Method**: A pool of contractors are pre-approved and given nominal contracts, permitting them to work on future maintenance projects in a rotational style. The contractors are promised a minimum value of work with the nominal contract. This method involves the administering of work orders for each contractor as assignments become available. Awarding contractors via the framework contract method can save time and money for in-house resources by reducing the number of bid packages and RFP’s needed. Potential urgent projects are recommended for this quick selection style of contracting. Performance, method and warranty based specifications can all be used for the framework model.

5. **Moderately Bundled Activities Contract Method**: Only a few maintenance activities with similar nature and sequences of work are outsourced to a contractor. An example would be sweeping, mowing and liter pick-up. Bundling activities helps the agency to decrease the amount of contracts on hand therefore reducing in-house overhead. This method is a good second step for agencies that have outsourcing experience. Experience will help them effectively bundle the proper activities for a contractor that can handle the increased workload. SHA’s should use this method if they have the in-house resources to handle inspections of the different assets included in the bundle. Performance specifications should be used for agencies looking to expand their experiences with PBMC. Riskier activities included in the bundle should have method-based specifications.
6. **Partial Competitive Maintenance Contract Method**: This method involves both in-house resources and outsourced crews as a means to deliver activity maintenance. A particular percentage of work is kept in-house while the remaining is outsourced. The outsourced work is then competitively bid on by both in-house staff and the contractor. The competitive bidding makes in-house staff innovate and develop better maintenance practices.

7. **Routine Maintenance Contract Method**: All routine maintenance activities are outsourced. This method is known as a Total Asset Management contract when performance specifications and lump sum contract is used. Elimination of separate contracts for routine maintenance will lower in-house costs when using a Total Asset Management contract. The contractor as with previous methods must be able to handle variety of work associated with the activities.

8. **Integrated Contract Maintenance Method**: This method incorporates both routine maintenance and preventative maintenance activities that will be outsourced as one contract. The term Total Asset Management contract is used for contracts using this method. Implementation of this contract is similar to that of the routine maintenance contract method. This method helps bundle an even larger number of activities thus helping to reduce in-house costs.

9. **Significantly Bundled Activities Contract Method**: This method outsources all maintenance activities except for a few that are unique, risky or priced better individually. This method differs from the moderately bundled method in that it contains more maintenance activities in the contract. Recommended for SHA’s that have a considerable amount of experience with the moderately bundled activities contract method and are comfortable outsourcing even more activities to one service provider. The contracts usually deal with all maintenance activities in a particular area or for a certain stretch of highway. This method is suited for contractors that have the ability to handle a considerable workload. Use of method-based specifications is the only recommend strategy for this contract method. It allows the agency to maintain greater control over “how” and “when” the work is completed.

10. **Total Asset Management Contract Method**: This method involves maintaining an asset throughout its lifecycle. The agency outsources operations, maintenance, upgrades to, and expansion of, an asset to a single service provider. Total Asset Management Contracts are about five years or more in length. Performance-based specifications are to be used which shift risk away from the agency. Agency should have a defined set of performance criteria that can be evaluated with in-house resources. Agencies should only engage with performance-based contracting if they have the knowledge on how to administer and maintain this type of contact. (VDOT’s model is classified under this heading).

11. **Alliance Contract Method**: This contract model awards the contractor based upon qualifications not price. After award, an “Alliance Team” should be formed consisting of both contractor and agency personal for administering the contract. Under this method, the contractor has the ability to gain or lose 15% of the contract value. After the contractor is selected, the agency negotiates a fixed price on the work and agrees on a fee as profit. This helps to reduce the potential conflicts that may arise between contracting parties compared to others methods. Only performance specifications should be used for evaluation of the contractors work.

12. **Kilometer (mile) Per Month Contract Method**: The contractor awarded is responsible for the routine maintenance of a sub-network of roads. The contract does not include large rehabilitation work or preventive maintenance for the roads. The sub-network must already be in fair to good condition if this method is to be used. The payment style is based on dollars per kilometer/mile of road maintained within a month. As long as service levels are maintained then daily penalties are avoided. This contract includes a grace period of 3 to 4 months for the contractor to repair existing deficiencies.

13. **CREMA Contract Method**: The “Combined Rehabilitation and Maintenance Method” contracts the service provider to first rehabilitate and then maintain a given sub-network of roads. This method is thought to be ideal
because it encourages the contractor to pay close attention to rehabilitation since they must maintain the road later. This contract type should be used on roads where the cost of maintenance is not economically appropriate. The agency will need to provide two sets of performance-based specifications for rehabilitation and another for maintenance. This is similar to the total asset management contract however, rehabilitation comes first.

In addition to the 13 methods above, Dr. Cindy L. Menches provides a contracting decision flowchart. This flowchart according to the report was driven by many sources including VDOT’s “Maintenance Decision Tree” which is presented in the report. The decision flowchart by Ms. Menches helps agencies choose the right contracting strategies depending on the activities in need of outsourcing. The user has to know a few inputs such as level of experience with PBMC, type of activity that will be contracted and specification type that will be used. Using these inputs, the user follows the chart and is led to the optimal contracting strategy (Menches et al. 2010). The decision flowchart from this report can be seen in Exhibit A.3 of Appendix A. The 13 contracting classifications in this report assisted the learning process early in the scan study. It also helped identify how a particular maintenance contract could be classified.

2.3.4 “Key Performance Indicators in Public-Private Partnerships: A State-of-the-Practice Report” by Federal Highway Administration (2011)

The KPI report was a collaborative effort between International Technology Scanning Program sponsored by FHWA, ASSHTO and NCHRP. These organizations set out to review, report and assist domestic agencies with adapting international best practices for highway transportation systems. The report also intends to facilitate further discussion on transportation system performance by engaging foreign agencies with the research. Working with both domestic and foreign agencies allows the International Technology Scanning Program to help with further advances in the transportation industry. The agencies responsible for this report realize that domestic agencies are fairly new with respect to using performance measurement. Learning from the international community and their in-depth experiences will benefit domestic highway agencies in numerous ways such as funding accountability. The conclusions formulated were based upon the data collection from eight PPP projects both domestic and foreign. The two domestic projects included in the study were Capital Beltway, Northern Virginia, Virginia Department of Transportation and I-595 Corridor Improvement, Broward County, Florida Department of Transportation (Garvin et al. 2011). Although this report deals with mainly PPP projects; there are beneficial performance indicators related to the operations and maintenance portions of the projects. Information from this industry report helps to build upon the already established performance measurement methods used by VDOT O&M personnel for attaining organizational goals. The performance indicators in this report are the newest in the industry and strive to provide public owners with better indications on how project stakeholders are maintaining the assets.

The KPI report reveals that government agency backed performance measures can be successfully translated through key performance indicators. Authors of the report feel that if implemented within project documents, KPI’s could potentially improve the attainability of overall agency goals such as seeking and responding to feedback from customers. The use of KPI’s in Public-Private Partnerships is a large focus of the report; however, the report emphasizes that the use of KPI’s can be adapted to fit traditionally procured contracts as well. The integration applicability of KPI’s for various procurement strategies and project phases makes this report beneficial for VDOT’s asset maintenance program.

Please see Exhibit A.4 in appendix A for the list of operations and maintenance performance indicators. These indicators are listed in the report as currently used by agencies such as FDOT (Garvin et al. 2011).
2.4 Literature Review Outcomes: Innovative Contracting Strategies

This section will review the major conclusions derived from investigating all six agencies (each agency had three areas of information collected; topic area one, two and three). Upon completion of the mini-scan study there was a reflection period. The reflection involved looking for overall themes and industry trends relating to how highway agencies are currently procuring maintenance work. The research reflection yielded seven major conclusions, which were grouped into three main categories/themes (Figure 3). These three main categories are known as “Innovative Contracting Strategies” and each demonstrates a different strategy, which current performance-based contracting practitioners are using to evolve the way maintenance services are delivered. The highway maintenance industry appears to be making progress using these three new and innovative contracting strategies. Progress has been realized and measured through many areas including level of service increases and more effective risk allocation (less disputes and claims). The three new and innovative contracting strategies are:

1. Use of a larger/diverse scope of services within the contract.
2. Use of an integrated/collaborative project team.

![Figure 3 - Innovative Strategy Formulation](image)

2.4.1 Strategy #1 – Use of larger/diverse scope of services within the contract

The three major research observations/conclusions leading to this contracting strategy were:

- Conclusion 1.1: Four of six agencies studied have successfully applied performance-based contracts in an “Area-Wide” forma. (Australia, England, New Zealand, FDOT).
- Conclusion 1.2: Agencies are using numerous contract styles to procure maintenance services.
Conclusion 1.3: The main distinction between domestic and foreign highway agencies is the inclusion of capital works delivery.

2.4.1.1 Conclusion #1.1: Four of Six agencies have successfully applied performance-based contracts in an “Area-Wide” format. (Australia, England, New Zealand, FDOT.)

The following are the four agencies currently using some form of “Area-wide” maintenance contract (type of contract is also listed):

1. Main Roads of Western Australia – Integrated Services Arrangements
2. England’s Highways Agency – Managing Agent Contractor program
3. New Zealand Transport Agency – Performance-Specified Maintenance contracts
4. FDOT – Asset Maintenance: Area-wide contracts (used both district/countywide)

An area wide maintenance contract is most recognizable through its use of geographical boundaries for project limits. Figure 4 displays a sample of how an area-wide maintenance contract looks. Figure 4 shows England’s area-wide maintenance system. England’s system comprises of 14 maintenance areas each with its own Managing Agent contractor (Usually a PMF & Contractor joint venture).

Figure 4 – “Area-wide” Contract Sample – England

To better understand the “Area-wide” maintenance contract there needs to be a brief explanation as to where “Area-wide” fits in the grand scheme of maintenance contracts. Figure 5 is a contracting hierarchy put together to show how various contracting styles compare in scope size (costs may vary). This hierarchy was inspired by information obtained in NCHRP synthesis report.

The smallest scope contract is the “Single Activity” style that can be used for activities such as striping or sign replacement. “Single Asset” and “Related Activities” are two other styles used for maintaining particular assets such as bridges or rest areas. The “Corridor” style is the method currently used by the VDOT TAMS program for multiple interstate highways. This style is very common among agencies currently practicing performance-based
maintenance as well as new comers in the field who are looking to launch pilot projects. NCDOT is a great example of an up and coming performance-based program. Their 2007 corridor style pilot project is centered in the Charlotte area encompassing numerous interstates (“fence-to-fence”).

The “Area-wide” contract lies at the bottom of the pyramid as the bearer of largest scope. The area-wide contract typically has the largest scope because it encompasses multiple sized road categories in one contract as well as other assets not normally in a corridor style contract (ex. Rest Areas). Interstates, primary and secondary roadways may all be included in an area-wide contract. For example, FDOT uses area-wide style in various districts to maintain their primary and secondary roadways (district-wide contract). Another unique thing about an area-wide contract is that it can be a compilation of multiple style contracting methods in Figure 5. For example, an area-wide contract could be formed by combining a single asset, related activities and corridor style contract all in one. This would give a public agency the ease of a single point provider for potentially all bridge, rest area, weigh station and roadway maintenance within a particular district or county.

Figure 5 – Maintenance Contracting Hierarchy

How do we know “Area-wide” maintenance is taking off in the industry? Scanning the literature during the research yielded numerous results that support the observation that the “Area-wide” contracts have grown in usage over the past 15 years. According to NCHRP 389, area-wide contracts are taking off in the industry compared to corridor-style only contracts (Hyman 2009). Researchers surveyed 61 DOT’s, District of Colombia and Canada (no international agencies surveyed) regarding their use of PBMC’s and current style of contract. 11 of the 42 respondents said they used Performance-Based Maintenance Contracts (PBMCs). Together those 11 user agencies had 70 PBMCs contracts currently being administered for various maintenance activities. Interestingly area-wide style has a considerable amount of the market share within the performance-based contracting market in North America Figure 6.
International agencies such as Australia, England and New Zealand have large performance-based programs evolving over the past 10 – 15 years. The early maintenance strategies of these nations resembled the contracts used by VDOT; corridor-only (fence-to-fence) contracts for a major interstate highway. Although fence-to-fence contracts worked well, agencies needed to extend contracts to cover greater areas in order to reach more assets. The additional assets in need of maintenance were usually under traditional method-based contracts or maintained by in-house forces. Rolling these assets into a larger “Area-wide” performance-based contract served as potential cost savings solution for the maintenance work that needed to be performed. The international area-wide contracts commonly use relationship management techniques such as Alliancing and Partnering to bring stakeholders together. The international area-wide contracts also tend to cover assets over a wider geographical location. These contracts may include local government assets as well as multiple roadway types not just major interstate sized roads (primary and secondary state roads included in area-wide). This allows highway agencies to decrease the resource demands normally straining local governments who maintain the smaller roads. To demonstrate the make-up of an international area-wide contract see Figure 7. Figure 7 is as snapshot of where Main Roads of Western Australia used to be in early 2000’s with their corridor-style only contracts. An evolution has taken place to a larger scope contract; the area-wide Integrated Services Arrangements (ISA). While conducting this research I contacted the ISA Program Director, Robert Barnsley, regarding my research scope and information requests. His help was crucial in understanding the new program and he graciously provided me with a copy of an RFP currently being used for the new ISA contracts. The RFP provides a layout for how services will be conducted and how relations will be managed in the new ISAs.
Here are some highlights of the new Integrated Services Arrangements by Western Australia:

- 7 – ISA contracts (A-G) derived from 9 TNC contracts (corridor).
- ISA contracts will have 5-year minimum term with a possible extension of +1+1… (Continuing on indefinitely but only if performance is kept to agency standards.)
- Contractor performance evaluations begin in year 3.
- ISA use cost-plus scheme; TNCs used lump-sum
- Scope includes Operational Asset Management, Network Operations, Maintenance Delivery, Capital Works Delivery (< $3M), Project and Contract Management.

The ISA program by Main Roads requires the ISA Team (Contractor or joint-venture team) to be responsible for the following:

- All on-road and off-road assets within Main Roads road reserve (i.e. “fence to fence”, including structures)
- All bridges on other public roads (as per Main Roads responsibilities)
- Regulatory signs and road markings on regional LG roads
- Nearly all traffic signs and road markings on metropolitan LG roads
- Exclusions include local street signs, local information and community services signs, parking signs (including associated lines and road marking)

The main distinction for the ISA is the inclusion of multiple sized roads, local government assets, territorial boundaries and most importantly the Alliencing contract structure. See Chapter 2 Section 2.4.2 for the Alliance structure.

Domestically, FDOT has been able to implement numerous “Area-wide” contracts for district-wide maintenance. FDOT has proven “Area-wide” practices can be adopted and provide solid results for maintenance needs in the USA. Studying the FDOT program as well as investigating industry reports on performance-based contracting led to the next conclusion under innovative strategy one.
2.4.1.2 Conclusion #1.2: Agencies are using numerous contract styles to procure maintenance services

After discussing performance-based contracting with NCDOT maintenance engineer, Jennifer Brandenburg, the notion of multiple style contracts for service delivery became clear. Ms. Brandenburg described the strategy as beneficial by providing a diversified contracting “toolkit”. The diversification of contracting styles is most prevalent in the state of Florida. FDOT’s Asset Maintenance contracting program uses multiple styles across its seven districts and Turnpike Enterprise. According to the FDOT Maintenance webpage, there are three main types of performance-based contracts:

- Asset maintenance contracts (Largest – 5 – 10 yr. term)
- Best Value performance contracts
- Low Bid performance contracts

The AM contracts were the focus while investigating FDOT Maintenance Division. The AM contracts can be split into three sub-classifications: AM Corridor style, AM Geographic style and AM Limited Focus. Currently the AM program contains over 30+ active contracts with more in the works. The dollar range for these contracts is anywhere between $6.5 and $95 million dollars. The larger dollar value contracts tend to be the AM Geographic style. Figure 8 is a layout of the three categories of AM contracts with examples of each. The Florida map to the right shows the state dividing into its seven maintenance districts and one turnpike enterprise.

![Figure 8 – FDOT Maintenance Contract Styles (Florida 2011)](image-url)
Survey results from NCHRP report show the industry trends towards diversifying contract portfolios (FDOT has multiple styles of PBMCs in use):

<table>
<thead>
<tr>
<th>Types of Maintenance Contract</th>
<th>Number of Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areawide contract covering a subunit of the state and involving a single activity or a related group of activities such as rest area maintenance</td>
<td>6</td>
</tr>
<tr>
<td>Areawide contract covering more than one activity or related group of activities within a state</td>
<td>5</td>
</tr>
<tr>
<td>Areawide contract covering all of the state and all or most maintenance activities</td>
<td>2</td>
</tr>
<tr>
<td>Contract for selected activities in a corridor</td>
<td>1</td>
</tr>
<tr>
<td>Contract for fence-to-fence maintenance covering all activities in a corridor</td>
<td>4</td>
</tr>
<tr>
<td>Total</td>
<td>18</td>
</tr>
</tbody>
</table>

Figure 9 – NCHRP Contract Style Diversity Results (Hyman 2009)
Used with permission by TRB

The number of agencies in Figure 9 totals 18; however, there were only 11 respondents in the NCHRP report claiming usage of performance-based contracting. This infers that some agencies are using more than one style to procure maintenance work. FDOT’s maintenance program falls into three contract style categories with their Asset Maintenance contracts (Corridor, Geographic and Limited Focus). It is important to note that FDOT was one of the 11 PBMC practicing agencies that returned a survey in the NCHRP study. Their contracts are directly included in Figure 9 numbers. The next section will look into the main division between domestic and foreign agency maintenance systems. Numerous features set them apart; however, international funding systems provide maintenance contractors a unique opportunity to display procurement talent.

2.4.1.3 Conclusion #1.3: The main distinction between domestic and foreign highway agencies is the inclusion of capital works delivery.

International agencies, unlike domestic agencies allow their service providers to participate in capital works delivery. The reason international agencies allow major capital works delivery is due to the funding structure of foreign nations. Unlike the segregated US system where maintenance and construction funding is in separate accounts, the international funding scheme tends to allocate a lump-sum amount for both maintenance and construction into a single pool. The foreign highway agency is then able to divide the funding as needed. International agencies claim to have better life-cycle costs with this funding capability because maintenance contractors provide design and construction input to agency personnel. Contractors get involved with idea generation of new capital work, strategic consulting and design for various capital improvement projects. Contractually the service provider can propose a capital improvement (up to a certain dollar value) as long as it adds “value” to the road network. Value is established based upon agency pre-established criteria and varies by country/agency. If a proposed idea is over the set dollar value threshold then the agency can publicly tender the
proposed road improvement. The idea behind maintenance contractor “Early Involvement” (design/construction phases) is that if a maintenance contractor designs and builds the facility they will provide higher quality work since later they will be maintaining their own finished product. It is in the contractor’s best interest to design and build the facility with great care. Future USA/VDOT contracts should look into how maintenance contractors can assist with design, procurement and construction of capital work in an attempt to improve life-cycle costing and road user satisfaction.

Domestic Agencies do not include major capital improvement works. Contracts for capital improvements are let separately through traditional method-based contracts:

- NCDOT – Routine and Preventative Maintenance. Rest Areas not included.
- TxDOT – Routine and Preventative Maintenance (no preventive pavement maintenance), Snow and Ice Control Services, Traffic Operations (associated w/ Maintenance). Emergency Services included. Rest Areas not included.
- FDOT – Routine and Preventative Maintenance (resurfacing not included).

Foreign Agencies allow contractor to deliver capital work up to certain $ value:

- Western Australia – Main Roads (MRWA) – Term Network Contracts (< $1.5 million) and Integrated Services Arrangements (<3 million).
- England’s Highways Agency – Managing Agent Contractor construction, design (< $750K) increasing by 2.5% every year. Design and Management of works up to maximum ($1.2 million).
- New Zealand Transport Agency – Contractor design and construction (< $400,000)

Figure 10 displays the spectrum of delivery methods between international and domestic agencies.

Figure 10 – US vs. International System of Procurement (Gransberg et al. 2010)
Used with permission by NZTA
2.4.1.4 Why are agencies moving towards larger/diverse scopes?

Highway agencies are looking for newer ways to allocate project risks and it appears the maintenance industry is transforming their role from maintenance provider to an overseer/monitoring role with larger scope contracts. Agencies are becoming network managers more and more as private firms fill the contractor role, which agencies previously held. Below are some reasons why agencies are using various techniques discussed in each of the three conclusions under Strategy #1:

**Conclusion #1.1: Four of Six agencies have successfully applied performance-based contracts in an “Area-Wide” format (Australia, England, New Zealand, FDOT).**

- Why are agencies using more area-wide contracts? (Moving from Corridor → Area-wide)
  - Ease of single-point provider.
  - New contract tools help manage the risk.
  - Decrease in-house resources demand.
  - Greater risk transfer to private sector.
  - Reduction in contract administration costs.

**Conclusion #1.2: Agencies are using numerous contract styles to procure maintenance services.**

- Why are agencies diversifying contract portfolios?
  - Allows performance-based maintenance approach to reach more assets.
  - Specific assets (i.e., Rest Areas) allow contractors to focus.
  - Increased cost savings and LOS than traditional contracts.

**Conclusion #1.3: The main distinction between domestic and foreign highway agencies is the inclusion of capital works delivery.**

- Why are foreign agencies including capital works delivery?
  - Foreign country funding structures differ from domestic.
  - Agencies able to acquire innovative solutions.
  - Professional Services through the contractor saves money and builds trust between parties.
  - Promotes quality of final product (care in design/construction) because contractor must maintain the assets after construction.

2.4.2 Strategy #2 – Integrated/collaborative project team

Only one major research observation/conclusion led to this contracting strategy:

- Conclusion #2.1: Five out of the six agencies studied incorporated a concept called “relationship management” into their maintenance programs to manage public and private interactions. (All except TxDOT.)

This strategy is powerful and gaining popularity in the maintenance industry. These relationship management techniques were adopted from other industries such as oil and gas (Egan 1998).
2.4.2.1 Conclusion #2.1: 5 out of the 6 agencies studied incorporate a concept called “relationship management” into their maintenance programs (All agencies studied except TxDOT uses this technique.).

The use of contracts with “Relationship Management” techniques such as Alliancing and Partnering allows agencies to develop longer trusting relationships with maintenance contractors. First adopted from the oil and gas industry, Alliancing and Partnering philosophies were used to integrate the project team, benchmark performance and control costs. The construction industry soon caught on to this technique and began using it for projects; most notably in Australia and England. Highway maintenance agencies began to see the possibility of performance improvement on roads and decided to implement the Alliancing and Partnering practices. Before discussing specific examples of Alliancing and Partnering, the following text discusses the contacting technique in more detail.

Partnering is a smaller form of Alliancing based upon an agreement to work together to align stakeholder objectives and meet a common goal or outcome. See the partnering flow process in Figure 11.

![Figure 11 – Partnering Framework/Flowchart (Hyman 2009)](image)

Use with permission by TRB

The difference between Alliancing and Partnering is that Alliancing relies on contractual law rather than a non-binding collaborative agreement hinging on trust and integrity. The Alliance is an established project delivery system, partnering is not. A normal DBB contract could have a partnering charter running alongside the agreement as a means to keep the parties working together. The idea of a partnering workshop or charter continues to be used by US DOT’s including FDOT and NCDOT with their maintenance contracts. Both agencies specifically reference the partnering in their contractual specifications.

Partnering can be demonstrated though the use of the following techniques:
- Charters
- Workshops
- Team Building Exercises
- Dispute Resolution Mechanisms
  - Review Board/Panel
- Benchmarking
- Total Quality Management
- Business Process Mapping
Alliancing as describe previously is an established delivery system with contractual obligations between the contractor and owner. Figure 12 is the structure of a project Alliance. Alliancing can be characterized by the following traits:

- Pure Alliancing contracts are traditionally awarded based on 100% quality (not price).
  - Evaluation Criteria includes: safety record, insurance claims, claims and dispute record, Alliancing experience, etc.
  - Maintenance contracting which has adopted Alliancing award based upon a combination (price/quality). Percentages vary depending on the agency/country.
  - Maintenance Alliancing - Ex. Highways Agency in England awards based (70 Quality/ 30 Price)
- Alliance payment scheme
  - Reimbursement of direct cost + plus margin
- A fixed lump sum to account for margin (overheads and profits)
  - Equitable sharing of margin “Pain & Gain” as compared to the agreed “Target Price”

To demonstrate how a project Alliance has been adopted and adapted to fit highway maintenance needs a comparison was made between the established alliance structure in Figure 12 and the Western Australia ISA program structure (information gathered from the ISA Pilbara RFP). See the comparison in Figure 13. Main Roads of Western Australia provides numerous contract aids to facilitate the contractors understanding of how services will be delivered and what expectations are desired. It was noticed that three main elements of an Alliance were directly adopted and adapted for the ISA contracts. Here are the similarities between the structures:

- Alliance Board / Alliance Team → ISA Governance Board
- Project Director → ISA Branch Managers and Regional Managers for maintenance services
- Alliance Management Team → ISA Management Team (Mixture of Main Roads and Contractor staff working together.)
England and New Zealand have also made their own customized Alliance/Partnering variations to fit their own maintenance needs. England’s MAC program is particularly interesting because it claims to have used traditional ideas from VDOT maintenance contracts in addition to Alliancing and Partnering principles. This contracting combination in England has helped the Highways Agency climb to the top of the maintenance industry with top performance in areas such as safety and cost savings. Provided by the Highways Agency online are sample contract documents including a guidance manual explaining the agreement and expectations (duties/roles of each party). Here are the highlights of England’s MAC for Highway Maintenance:

- Managing Agent Contractor (Terms 4 – 7 years)
- MAC is a team (Service Mgr. & Provider)
- Three payment schemes
  - Lump-sum routine and preventative maintenance
  - Target Price – renewal & improvement schemes (pain/gain)
  - Cost Reimbursable – additional works (no assessed at tender)
- Network Board is used for “Alternative Dispute Resolution” (ADR) and “Total Quality Management” (TQM) compliance.
  - The board is a facilitator between parties & drives targets and reviews 3rd party performance audits.
The MAC guidance manual online provides the following table to exemplify how partnering principles are carried out through the MAC contract:

Table 7 - MAC Partnering Principles (Highways 2010)
Used with permission by Highways Agency

<table>
<thead>
<tr>
<th>MAC Partnering Principle</th>
<th>Partnering Benefit</th>
<th>Partnering Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long contract duration (4-7 years)</td>
<td>Long term work leading to common understanding of project and risk</td>
<td>Successful</td>
</tr>
<tr>
<td>Performance measurement (benchmarking)</td>
<td>Delivery of best practice and promotion of innovation</td>
<td></td>
</tr>
<tr>
<td>Performance measurement (continual improvement)</td>
<td>Organisational learning and sharing of knowledge</td>
<td></td>
</tr>
<tr>
<td>Payment mechanism</td>
<td>Equitable rewards for partners</td>
<td></td>
</tr>
<tr>
<td>Communication/relationship management</td>
<td>Reduction in disputes and improved decision making</td>
<td></td>
</tr>
<tr>
<td>Quality Management</td>
<td>Robust procedures and improved service delivery</td>
<td></td>
</tr>
<tr>
<td>Risk Management (Shared risk register)</td>
<td>Greater financial certainty for all parties involved in the contract</td>
<td></td>
</tr>
<tr>
<td>Self supervision (Audit and certification)</td>
<td>Removal of duplication of effort as partners concentrate on their core skills</td>
<td></td>
</tr>
</tbody>
</table>

2.4.2.2 Why are agencies using some form of “relationship management” in their contracts?

Alliancing & Partnering benefits over more traditional segregated delivery strategies have been reported as (Pakkala 2007):

- Increased productivity
- Reduced Costs
- Improved customer satisfaction
- Improved quality
- Reduced claims
- Clearly identify project requirements

Adapting both Alliancing and Partnering methods to suit maintenance needs has helped agencies reach increased cost savings compared to their old contracting methods:

- Highways Agency – cost savings of at least 20% (Pakkala 2007)
- Main Roads of WA – 35% (Pakkala 2007)
• NCDOT – used partner workshops for pilot projects (positive results according to Jennifer Brandenburg, Maintenance Engineer)
• FDOT – Districts use workshops throughout project timeline (positive results according to Mike Sprayberry, State Admin. Of Maintenance Contracting)
• NZTA – 20 – 25% cost savings (Pakkala 2007)

2.4.3 **Strategy #3 – Multi-faceted Performance Monitoring System**

Three major observations and conclusions that lead to this strategy were:

- **Conclusion #3.1:** Four out of six agencies incorporated performance indicators for areas other than measurable asset conditions (i.e., standard MRP type evaluation).
- **Conclusion #3.2:** A common method among foreign agencies is allowing the contractor to self-inspect.
- **Conclusion #3.3:** Agencies are using incentives to compliment disincentives in Performance-Based Maintenance Contracts (PBMCs).

2.4.3.1 **Conclusion #3.1: 4 out of 6 agencies incorporated performance indicators for areas other than measurable asset conditions (i.e., Evaluations other than standard Maintenance Rating Program)**

Agencies appear be using evaluation methods that are more than the typical “MRP” type assessment for collecting performance data. The following agencies are now incorporating various qualitative performance indicators to holistically evaluate a contractor performance. Whose doing it and what are they doing?

- **FDOT** – AMPER quality assessment program (2x per year)
  - Compliments the FDOT MRP program (3x per year)
- **NZTA** – Three Areas of Performance Monitoring
  - Management Performance Measures
  - Key Performance Measures (Related to Pavement)
  - Operational Performance Measures
- **HA** – Performance Measurement Framework
  - Eight Key Areas of Measure for various areas such as safety and environment.
- **MRWA** – Key Performance Indicators
  - KPI’s are not specifically stated in the RFP; however, they are agreed upon during the pre-start up meetings.

The AMPER evaluation by FDOT takes into account two required (black outlined circles) and three optional (depending on contract scope) inputs to determine a contractors overall quality score. Figure 14 shows what the inputs are for the semi-annual AMPER quality score. The AMPER complements the normal 3x per year MRP evaluations. FDOT is currently envisioning the AMPER eventually acting as a means to choose contractors during bidding. Bad AMPER scores could prevent the contractor from future work in a particular district or even the entire state. Table 8 is a snapshot of Section #1 of the AMPER spreadsheet, which was taken from the AMPER user guide provided by FDOT Maintenance. Section two contains four categories of performance indicators.
England’s Highways Agency also has another unique system aimed at well-rounded evaluation of maintenance contractors. England’s “Performance Measurement Framework” from Annex 15 of the contract details eight performance measures and the required “levers” or tasks a contractor must complete in order to align agency and MAC teams’ objectives. Table 9 is a snapshot from the MAC’s Annex 15. Here are the eight areas of measure that are the desired Highway Agency outcomes for their MAC maintenance program:

1. **Product** - the degree to which the delivered product meets expectations.
2. **Service** - the degree to which the service during delivery meets or exceeds expectations.
3. **Right First Time** - the impact of re-working and defects.
4. **Cost** - the degree to which costs are controlled.
5. **Time** - the degree to which key deliverables meet or exceed agreed completion dates.
6. **Safety** - The degree to which the risk of harm to persons or damage to facilities is limited.
7. **Team Culture** - To establish the extent to which behaviors and attitudes of all team members have a positive or negative influence on the outcome of a project. This is measured by the Agency Cultural Assessment Framework.

8. **Client Performance** - To establish the performance of the Highways Agency in fulfilling its Client role under the contract, using the 360-degree Supplier Feedback Report.

Table 9 - MAC Performance Framework (Highways 2010)

2.4.3.2 Conclusion #3.2: A common method among foreign agencies is allowing the contractor to self-inspect

Agencies have seen decreased costs by allowing the contractor to self-inspect. Having the contractor submit reports more frequently allows agency staff to monitor for compliance on an “as needed” basis. Agencies use a third party auditor to monitor the contractor when required. The idea behind self-inspections is to build trust between parties and to save the agencies money. Main Roads of Western Australia, New Zealand and England all have varying levels of contractor self-inspection to ease the burden on agency resources. In particular, Main Roads explicitly explains how the role of their third party will act in monitoring the contractor’s services in Table 10. Note that the PEG stands for Performance Evaluation Group which is the ISA (contractor) auditor hired by Main Roads to ensure compliance.
Conclusion #3.3: Agencies are using incentives to compliment disincentives in Performance-Based Maintenance Contracts (PBMCs)

The use of incentives to drive performance and promote a non-adversarial contract environment is becoming increasingly popular. Disincentives although effective at pushing the contractor along can also hurt relationships and increase claims. TxDOT Safety Rest Area contracts have been using incentive payments with disincentives since 2000. As a result, TxDOT has seen a dramatic decrease in customer complaints and increase in service levels. Main Roads of Western Australia uses an innovative term structure to promote good performance years by the service provider. A good year can allow the contractor to extend his contract or even make up for a bad year. FDOT uses MRP incentives to increase service. The FDOT contractor can regain the penalty deductions from a bad MRP if his/her end of year evaluations are above a certain threshold. Promoting positive performance through incentives has help agencies work closer with their service providers (decreased adversarial relations) resulting in better customer satisfaction among other areas. (e.g., asset conditions, crash rates) The Highways Agency and New Zealand Transport Agency also use incentives to reward contractors for performance above and beyond the expected level within a given time period.

The TxDOT Safety Rest Area program (Figure 15), an area-wide contract system, uses incentives to push performance. According to Andy Keith, program supervisor, the program has increase service levels dramatically to over 90% since its beginning in 2000. Previous service levels had been around 70% to 75% with numerous complaints on a daily basis from the traveling public. The incentives are based on the daily payment to the contractor (Table 11):
Figure 15 - TxDOT Rest Area Locations (Keith 2011)

Both used with permission by TxDOT

Table 11 - TxDOT Safety Rest Area: Incentive/Disincentive scheme (Texas 2011)

<table>
<thead>
<tr>
<th>Score</th>
<th>Desirable</th>
<th>Acceptable</th>
<th>Needs Improvement</th>
<th>Poor</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily Payment</td>
<td>+ 0.15/day</td>
<td>0</td>
<td>- 1.00/day</td>
<td>- 1.5/day</td>
<td>- 2.0/day</td>
</tr>
<tr>
<td>Multiplier</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score</td>
<td>92% or Greater</td>
<td>85% - 91.99%</td>
<td>80% - 84.99%</td>
<td>75% - 79.99%</td>
<td>Less than 75%</td>
</tr>
</tbody>
</table>

35
Another innovative incentive program was recently formulated by Main Roads of Western Australia. The term structure is designed to promote long-term relations of up to 25 - 30 years depending on the performance-level of the contractor. Sample terms are provided in the RFP as a “What if?” scenario. These scenarios show how a contractor’s term is effected based on their performance evaluations that start in year three in Table 12 and Table 13.

Table 12 - ISA Sample Contract Term Scenario #1 (Barnsley 2010)
Both tables used with permission by Robert Barnsley

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
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<th>12</th>
<th>13</th>
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</thead>
<tbody>
<tr>
<td>Performance Assessment</td>
<td>N/A</td>
<td>N/A</td>
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<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
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<td>Positive</td>
<td>Positive</td>
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</tr>
<tr>
<td>Length of Term (years) from Commencement Date</td>
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<td>8</td>
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<td>(LYF1)</td>
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<tr>
<td>Balance of Term (years) remaining following end of Year</td>
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<td>3</td>
<td>3</td>
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<td>3</td>
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<td>3</td>
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</tr>
</tbody>
</table>

Table 13 - ISA Sample Contract Scenario #2 (Barnsley 2010)
This worked example shows the effect of a Negative Performance Trend (NPT) (i.e. 2 out of 3 Negative Assessments).

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<tbody>
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</tr>
<tr>
<td>Balance of Term (years) remaining following end of Year</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Having three positive assessments in year 6 through 8 allows the contractor to make up for a bad performance year (yr. #5). Bad performance year give the contractor one “Lost Year Factor” which affects the balance of their term.

2.4.3.4 Why are agencies promoting multi-faceted performance monitoring methods of maintenance contractors?

There are several reasons why agencies are using various performance monitoring techniques that are discussed in each of the three conclusions under Strategy #3.

Conclusion #3.1: Four out of six agencies incorporated performance indicators for areas other than measurable asset conditions (i.e., standard MRP type evaluation). Why are they doing this?

- A wide-range of indicators yields a holistic approach to the provision of services.
- Better justification for payment adjustments.
- Continual Improvement of Asset Conditions with benchmarking and target setting.

Conclusion #3.2: A common method among foreign agencies is allowing the contractor to self-inspect. Why are they doing this?

- Agencies claim to reduce cost through less oversight of contractor.
- Contractors required to submit more reports under “self-inspection”.
- Agencies use third parties for auditing contractor to maintain compliance.

Conclusion #3.3: Agencies are using incentives to compliment disincentives in PBMCs. Why are they doing this?

- Drive LOS increases and reward contractors for performing beyond specified standards.
- Develop long-term relations with service providers.
- Create a year on year improvement system, which hinges on benchmarking principles.
- End Goal: Attract, Acquire, Attain qualified contractors.

2.4.4 Contracting Matrix (6 Agencies Side by Side)

To assist in learning about the six agencies in this report a contract matrix was formulated for side-by-side viewing. The matrix contains some of the main highlights from each of the six agencies (Ex. Contract Duration). Contract highlights were deemed “performance parameters” and classified under each of the three topic areas. For example, under Area #1 a “performance parameter” for side-by-side comparison would be “Traffic Operations” (Yes or No) within the scope of services. It is important to note that an exact one-one relationship with information should not be inferred for some of performance parameters due to the variable nature of the data. Each of the six agencies employs different methodologies for calculating information such as cost savings or level of service. The side-by-side presentation is used merely to display the variety of results among contracting styles in the industry.
<table>
<thead>
<tr>
<th>Table 14 - Comparison Matrix for Highway Agencies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highway Agencies (Contract)</strong></td>
</tr>
<tr>
<td><strong>Domestic</strong></td>
</tr>
<tr>
<td>NCDOT (Charlotte Pilot Project Version 1)</td>
</tr>
<tr>
<td>TxDOT (Routine Maintenance and Operations of Highways - CSI 6202-14-001)</td>
</tr>
<tr>
<td>FDOT (Asset Maintenance Contract)</td>
</tr>
<tr>
<td>VDOT (I-64 TAMS contract)</td>
</tr>
<tr>
<td>Western Australia</td>
</tr>
<tr>
<td>Term Network Contracts</td>
</tr>
<tr>
<td>Integrated Services Arrangements</td>
</tr>
<tr>
<td><strong>International</strong></td>
</tr>
<tr>
<td>England (MAC)</td>
</tr>
<tr>
<td>New Zealand (PSMC)</td>
</tr>
<tr>
<td><strong>Contracting Began</strong> (Performance Program)</td>
</tr>
<tr>
<td>2007</td>
</tr>
<tr>
<td>1999-2009</td>
</tr>
<tr>
<td>2000</td>
</tr>
<tr>
<td>1997-1998</td>
</tr>
<tr>
<td>1996-2011</td>
</tr>
<tr>
<td>2011 - n/a</td>
</tr>
<tr>
<td>2001 - 2015 Asset Support Contracts will take over by 2025.</td>
</tr>
<tr>
<td>1998</td>
</tr>
<tr>
<td><strong>Contract Style</strong></td>
</tr>
<tr>
<td>Corridor</td>
</tr>
<tr>
<td>6202-14-001 – Corridor</td>
</tr>
<tr>
<td>Corridor</td>
</tr>
<tr>
<td>Corridor</td>
</tr>
<tr>
<td>Area-wide (large)</td>
</tr>
<tr>
<td>Area-wide</td>
</tr>
<tr>
<td>Corridor</td>
</tr>
<tr>
<td><strong>Contract Value (Avg.)</strong></td>
</tr>
<tr>
<td>$213 million</td>
</tr>
<tr>
<td>$19.6 million</td>
</tr>
<tr>
<td>$900 million in total contracts, $125 million annually. 1st contract = 79.5 million</td>
</tr>
<tr>
<td>$16.5 million</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>July 2010 A-one+ started the new Area14 contract worth $147 million over 5 years, following the previous successful 7 year contract as A-one.</td>
</tr>
<tr>
<td>PSMC067 West Waikato &amp; Bay of Plenty - Hamilton office Date awarded: Jul 2011 Estimated value: $129,000,000.00</td>
</tr>
<tr>
<td><strong>Contract Length</strong> (Center-line or lane miles)</td>
</tr>
<tr>
<td>131 center-line</td>
</tr>
<tr>
<td><strong>1st contract – 254 center-line miles</strong></td>
</tr>
<tr>
<td><strong>77 center-line miles</strong></td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>2,275 km (1,414 center-line miles)</td>
</tr>
<tr>
<td>300 km (186.4 center-line)</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td><strong>Contract Duration</strong></td>
</tr>
<tr>
<td>7 years</td>
</tr>
<tr>
<td>3 years + 2</td>
</tr>
<tr>
<td>7 to 10 years w/ extensions no longer than org. duration</td>
</tr>
<tr>
<td>5 years w/ possible extension</td>
</tr>
<tr>
<td>10 year fixed term</td>
</tr>
<tr>
<td>5 years + 1 +1... term dependent on performance. 5 to 7 years w/ potential extension 10 year fixed term</td>
</tr>
<tr>
<td><strong>Payment Style</strong></td>
</tr>
<tr>
<td>Lump Sum</td>
</tr>
<tr>
<td>Lump Sum</td>
</tr>
<tr>
<td>Lump Sum – Payment Schedule Used.</td>
</tr>
<tr>
<td>Lump Sum</td>
</tr>
<tr>
<td>Lump Sum</td>
</tr>
<tr>
<td>Cost-plus</td>
</tr>
<tr>
<td>• Target Price for capital works</td>
</tr>
<tr>
<td>• Lump Sum - Routine and Periodic Maintenance</td>
</tr>
<tr>
<td>Lump Sum</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Area #1: Parameters – Scope of Services</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Periodic Maintenance</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td><strong>Routine Maintenance</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td><strong>Capital Works</strong></td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>No, Resurfacing is not under scope.</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes, up to $1.5 Mil</td>
</tr>
<tr>
<td>Yes, up to $50K increasing by 2.5% each year of term.</td>
</tr>
<tr>
<td>Yes, up to $400K</td>
</tr>
<tr>
<td><strong>Traffic Operations</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td><strong>Timeliness Requirements</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes (No formal list in contract)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes, RIMP (Intervention parameters)</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes, API Handbook Includes</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td><strong>Alliancing or Partnering used</strong></td>
</tr>
<tr>
<td>Yes – use of Partnering Charter</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>Yes – Alliancing Charter</td>
</tr>
<tr>
<td>Partnership via Network Board</td>
</tr>
<tr>
<td>Partnership via Management Team</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Area #2: Performance Assessment</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Evaluation Program</strong></td>
</tr>
<tr>
<td>Yes – Maintenance Condition Assessment (MCA)</td>
</tr>
<tr>
<td>Yes – TxMAP program</td>
</tr>
<tr>
<td>Yes – MRP program</td>
</tr>
<tr>
<td>Yes – MRP program</td>
</tr>
<tr>
<td>Yes – Multi-level</td>
</tr>
<tr>
<td>Yes, Multi-level</td>
</tr>
<tr>
<td>Yes, 3 areas of measure (assets, management, operations)</td>
</tr>
<tr>
<td><strong>Nomenclature</strong></td>
</tr>
<tr>
<td>Components/Elements</td>
</tr>
<tr>
<td>Components/Elements</td>
</tr>
<tr>
<td>Elements/Characteristics</td>
</tr>
<tr>
<td>Asset Groups/Asset Items</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td><strong>Evaluation Frequency</strong></td>
</tr>
<tr>
<td>Every 6 months</td>
</tr>
<tr>
<td>Monthly Inspections</td>
</tr>
<tr>
<td>MRP = 3x per year</td>
</tr>
<tr>
<td>Up to 3 but no less than 3 in 12 months</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>n/a</td>
</tr>
<tr>
<td>Amper – 2x per year</td>
</tr>
</tbody>
</table>

38
2.4.5 **Discussion on Matrix**

The comparison matrix was a driving force behind the three overall innovative strategies identified earlier in this chapter. It was noticed that international agencies are striving for longer-term contracts with considerably more lane-miles of roadway maintenance required. The side-by-side comparison also shows that using partnering is a common trend among the agencies and is linked to performance evaluations. The agency and contractor use the partnering to agree on quarterly and yearly performance targets to continually drive better levels of service. Interestingly, Western Australia had corridor style contracts similar to VDOT and other domestic agencies and then decided to convert to a larger area-wide format with a different contractual structure. The switch at Western Australia is similar to the MAC program in England with area-wide contracts and payment methods such as cost-plus as opposed to lump sum.
3 North Carolina Department of Transportation

3.1 Maintenance Program Background

In March of 2007, North Carolina Department of Transportation - Maintenance Division launched their first large scale performance-based maintenance contract for portions of their Interstate highway system (Arnold et al., 2009). The maintenance division’s level of experience with performance-based contracts is very new compared to other Domestic DOT’s. Prior to 2007, the maintenance division had been outsourcing with primarily traditional method-based contracts. These traditional contracts used either NCDOT resources or contracted out using method-based specifications. Traditional contracts were let for activities such as shoulder mowing within the right-a-away and guardrail repair.

NCDOT is responsible for the second largest highway system in the country at approximately 79,000 miles of roadway. This immense agency burden has, in recent years, begun overrunning maintenance division resources with work demands (Arnold et al., 2009). The increasing work coupled with restrictions on hiring new internal forces drove the agency to explore newer contracting alternatives for highway maintenance. Alternatives that could potentially save public funds reduce in-house resources and provide better risk allocation. The only issue with implementing new contracting styles was legality. There were no laws permitting this type of public-private partnership agreement. Discussions with law makers regarding their current maintenance struggles took place in early 2000’s and finally in 2005, the department was granted permission to try new contracting methods. The North Carolina General Assembly passed SB 622 stating, “The Department of Transportation may implement up to two performance-based contracts for routine maintenance and operations, exclusive of resurfacing.”

NCDOT’s maintenance division now had the permission they needed and began work on developing and planning for their first performance-based maintenance contract. Realizing their inexperience with performance-based maintenance contracting the department reached out for a mentor. They contacted maintenance divisions of Virginia DOT and Texas DOT for assistance in contract development (Arnold et al., 2009). Both departments assisted with the department’s efforts to define a contract scope as well as road elements for assessment. The agencies also offered their experiences with the performance-based approach and ways of gaining local contractor interest. The contract development was a long and tedious process but ended up being successful. NCDOT was able to advertise the new pilot project in June 2006.

After advertisement, NCDOT decided to gather a team of experts to further develop the contracting documents as well as locate the best area for the project. In-depth investigations were conducted regarding various feasible locations. After much consideration into the economical and logistical factors, NCDOT decided to locate the project in Charlotte, North Carolina. Gaining local contractor input also assisted with choosing a contract length. Contractors recommended the contract be over 100 centre-line miles with a duration longer than traditional method-based contracts. NCDOT took the advice and set the contract up for approximately 700 lane miles (131 centre-line) of I-85, I-77, I-277 and I-485; located in Cleveland, Gaston, and Mecklenburg counties (Arnold et al., 2009). Figure 16 provides a map of the project limits.

Once the project location was specified the project team began working on the procurement documents. The procurement process was a best-value process that resulted in a shortlist of 4 contractors. The shortlisted firms were Balfour Beatty, Blythe Construction, DeAngelo Brothers, Inc. (DBI), and Infrastructure Corporation of America (ICA) (Arnold et al., 2009). To promote clarity during the procurement process, NCDOT held question and answer sessions with prospective contractors. Soon after these discussions the department issued a final BAFO RFP in January 2007. Two months later the final decision was made to award the contact to Infrastructure Corporation of America (ICA) on March 12, 2007. The final contract totalled $23 million dollars with duration of 5 years. The project was made available to ICA on July 1, 2007 (Arnold et al., 2009).

During the start-up process NCDOT wanted to ensure that all parties were in agreement regarding desired outcomes. To align desired outcomes the agency held a partnering workshop on May 8, 2007 with ICA and FHWA.
FHWA acted as a facilitator while NCDOT and ICA discussed desired project outcomes (Arnold et al., 2009). To solidify the discussions, a partnering charter was developed. A major highlight of the partnering charter included a dispute resolution process.

3.2 Area #1: Scope of Services (Pilot Project)

As stated in the background section, the winning contractor, ICA was responsible for about 700 lane miles (131 centre-line) of Interstates 85, 485, 77 and 277. The contract requires maintenance operations such as routine maintenance, minor repairs, collision damage repairs, and emergency repairs in 7 areas (North, 2007):

- Shoulder and Ditches
- Drainage
- Roadside
- Roadside Appurtenances
- Traffic
- Pavement
- Bridge
- Timeliness of Performance
- Hazardous Waste Removal

In addition to the 9 areas above the contractor was also responsible for any traffic control, design, shop drawings, and permits required to satisfy their maintenance contract duties. A “Snow and Ice Control” service was let as a bid alternate; however, the state decided not to include this work after the bids were submitted. The primarily reason was financial; the states estimate turned out to be cheaper (~20 times) than bidder estimates (Arnold et al., 2009).
In addition to the work areas above the contractor is required to submit various work plans and reports to the agency throughout the project duration. A full list of required work plans and reports is listed in the comparison matrix (Exhibit B.2). The comparison matrix is a side-by-side view of the pilot project BAFO RFP and VDOT I-64 TAMS Culpeper RFP. The RFP’s are compared in various contracting elements such as performance evaluations. Additional information can be located in Appendix B, Exhibit B.1, “Scope of Services”. Exhibit B.1 is a copy of the actual scope of services section from the BAFO RFP. This matrix also lists various duties the contractor must abide by.

The BAFO RFP describes a total of 37 elements within the right-a-way which the contractor must maintain to a particular service level. These 37 elements are assessed through inspections and can be segregated into seven various right-a-way/roadway components. The seven component categories that will be assessed are Bridges, Pavement repair, Shoulder and Ditch, Drainage, Roadside appurtances, Roadside and ITS. Table 15 shows each of the seven components with its corresponding set of elements. Each element has specific performance requirements that must be met and will be checked during inspection. More information on performance requirements and inspections is provided in the next section (Topic Area #2).

Table 15 – NCDOT: Contract Elements (Arnold et al. 2009)

<table>
<thead>
<tr>
<th>Element</th>
<th>Element</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges</td>
<td>Bridge decks</td>
</tr>
<tr>
<td></td>
<td>Superstructure</td>
</tr>
<tr>
<td></td>
<td>Substructure</td>
</tr>
<tr>
<td>Pavement repair</td>
<td>Asphalt pavement repair</td>
</tr>
<tr>
<td></td>
<td>Paved shoulder condition</td>
</tr>
<tr>
<td>Shoulder and ditch</td>
<td>Low shoulder</td>
</tr>
<tr>
<td></td>
<td>Lateral ditches</td>
</tr>
<tr>
<td>Drainage</td>
<td>Crossline pipe (blocked)</td>
</tr>
<tr>
<td></td>
<td>Curb and gutter (blocked)</td>
</tr>
<tr>
<td></td>
<td>Drop inlets, CBs, etc. (blocked)</td>
</tr>
<tr>
<td>Roadside appurtances</td>
<td>Guardrail–cablerail</td>
</tr>
<tr>
<td></td>
<td>Noise walls</td>
</tr>
<tr>
<td>Roadside</td>
<td>Mowing</td>
</tr>
<tr>
<td></td>
<td>Turf condition</td>
</tr>
<tr>
<td></td>
<td>Uncontrolled growth</td>
</tr>
<tr>
<td></td>
<td>Slopes</td>
</tr>
<tr>
<td>Traffic–Intelligent transportation systems (ITS)</td>
<td>Pavement markings</td>
</tr>
<tr>
<td></td>
<td>Ground-mounted signs</td>
</tr>
<tr>
<td></td>
<td>Roadway lighting</td>
</tr>
<tr>
<td></td>
<td>Sign lighting</td>
</tr>
</tbody>
</table>
3.3 Area #2 – Contract Performance Monitoring

3.3.1 Pilot Project: Assessments Overview

The NCDOT pilot project staff put together an assessment program that was similar to the already established methodology used on NCDOT projects. The name of NCDOT’s program is the “Maintenance Condition Assessment” or MCA for short. The MCA’s on the pilot project took place at six month intervals using the same sampling methodology used by VDOT on their performance-based maintenance contracts (stratified random, 95% confidence level). The assessments were taken on randomly selected 0.2 mile sections of roadway for linear features. Point features such as pipes and bridges were also assessed using the random sampling procedure (North 2007).

In order to maintain an objective assessment process the assessment team members were pulled from local agency divisions by the central maintenance office. Keeping the day-to-day project personnel (contractor and local division staff) distant from the inspections was a priority in maintaining a credible process. Central maintenance division staffs were in charge of random samples, training programs, spot checking during assessment periods as well as compiling and distributing the results.

Prior to awarding the contract, the NCDOT staff decided to compile an initial assessment of the project in order to give bidders a general idea of conditions (Arnold et al. 2009). In addition, the initial assessment enabled the agency to judge the attainability of performance targets set out in the initial RFP. Once the baseline assessment was completed, agency staff realized the original targets would not be realistically achieved by the contractor within the first six months. In an effort to avoid over penalizing the contractor for conditions out of their control the department decided to use phased performance targets on various elements. Using a phased performance target strategy meant incrementally increasing LOS targets for assets in undesirable condition. Table 16 shows the phased targets for the bridge component and elements for years 2007 to 2009. Targets in 2009 serve as the standard performance targets that must be met in subsequent years (2010 – 2012 or later). It is important to note, not all elements under each of the seven components have phased performance targets. For example, the component “Bridges” has phased targets for only bridge decks, superstructure and substructure. This most likely means the baseline assessment by NCDOT revealed that bridge conditions within these elements were in poorer condition. The full table of phased performance targets including all seven components and 37 elements can be found in Exhibit B.1 under the performance criteria table, column three from the left.

Table 16 – NCDOT: Phased Performance Targets (Arnold et al. 2009)

<table>
<thead>
<tr>
<th>Element</th>
<th>2007 Target</th>
<th>2008 Target</th>
<th>2009 Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridges</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridge decks</td>
<td>80</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>Superstructure</td>
<td>80</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>Substructure</td>
<td>80</td>
<td>85</td>
<td>90</td>
</tr>
<tr>
<td>Pipes and culverts</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Retaining walls</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>Channel and slope protection</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
</tbody>
</table>

The overall combined maintenance assessment condition score which is the total from all seven component areas must meet the following rating (North 2007):

- Calendar Year 2007 – 88
- Calendar Year 2008 – 90
- Calendar Year 2009 – 92
The final best and final offer RFP from January 2007 also states the contractor must meet two conditions to avoid termination during the contract period (North 2007):

- Contractor overall assessment rating shall not be greater than five points below the specified target for four consecutive years.
- Contractor element ratings shall not be greater than 15 points below the specified target for four consecutive years.

To guide the contractors and inspectors on the department’s desired outcomes NCDOT put together a list of performance criteria and tolerances for each of the seven roadway components. Table 17 shows a snapshot of the “Performance Criteria and Target Tables” used to evaluate the “Paved Shoulders” element. The “Pave Shoulders” element falls under the “Pavement” roadway component. Notice the table describes both the component and element weighting factors. Pavement is 0.2 and Paved Shoulders is 0.02. The following is a list of weighting factors used for each of the seven components (North 2007):

- Bridges (0.15)
- Pavement (0.2)
- Shoulder and Ditch (0.1)
- Drainage (0.1)
- Roadside appurtenances (0.15)
- Roadside (0.15)
- Traffic/ITS (0.15)

For a full listing of element weights see Exhibit B.1. The weighting factors are used for calculating the monthly partial payments. Information on payment for performance and how weights are involved is detailed in Section 3.3.2.

<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paved Shoulders (0.02)</td>
<td>Safe, smooth</td>
<td>90 (2007-2012)</td>
<td>• Pavement failures are repaired with permanent patches in kind (asphalt with asphalt, concrete with concrete) as soon as weather conditions permit.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Rumble strips are retained or replaced when damaged.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Longitudinal joint separation is &lt;0.5” or is sealed.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• No unsealed cracks in asphalt shoulders larger than 0.5”</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Cross section allows drainage from mainline (no shoulder buildup). No vegetation present.</td>
</tr>
</tbody>
</table>

The contractor will not only be assessed based on his/her ability to meet “Maintenance Condition Assessment” targets but also “Timeless Targets” as well. Timeliness requirements include such areas as debris/road kill removal.
and pavement repair. Some but not all timeliness requirements have liquidated damages attached to them. Timeliness requirements are not factored into the partial payment calculations only the assessment scores of the 37 elements (North 2007). The BAFO RFP states the contractor must have an 80% response rate for all timeliness areas which do not have liquidated damages attached. The 80% response rate must be maintained at all times for these areas or the contractor risks default (North 2007). The target response rate for all categories is 100%. Table 18 is an excerpt taken from the “Timeliness Performance Criteria” table in the RFP. For the full list of timeliness, requirements please see Exhibit B.1 in appendix B.

Table 18 – NCDOT: Sample Timeliness Performance Criteria (North 2007)
Used with permission by Jennifer Brandenburg

<table>
<thead>
<tr>
<th>General terms and conditions ELEMENT</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Debris/Road Kill Removal &amp; Litter Removal as directed by DOT or other customers</td>
<td>Roadway free of obstruction Litter Free</td>
<td>100 (2007-2012)</td>
<td>• Respond immediately upon notification or discovery • Road kill and Debris promptly and properly disposed • Litter complaints from public or notification from Department personnel addressed promptly and thoroughly</td>
</tr>
</tbody>
</table>

3.3.2 Pilot Project: Payment for Services

Assessments every six months are used to calculate the contractor’s partial payment for services provided. Assessments are scheduled to be completed by every January 1st and July 1st. To assist the contractor, NCDOT decided to waive the “pay for performance” provision on the first six-month assessment scheduled for starting in October 2007 (ending by Jan. 1st). This allowed the contractor to receive penalty free payments for the first year of the contract; therefore, allowing the contractor time to raise asset conditions. As a reminder, the project was made available to ICA on July 1, 2007. Penalty free payments were made to ICA up until June 2008.

Partial payments for performance are based upon the most recent assessment. For example, partial payments for January 2008 thru June 2008 would be based off the assessment conducted in October 2007 and published by January 1st 2008. Assessments conducted in the spring of 2008 would affect partial payments for July 2008 thru December 2008.

Table 19 shows a small snapshot of the sample monthly payment calculation provided in the RFP. The entire sample monthly partial payment calculation from the RFP can be seen in Exhibit B.1 of Appendix B. Payments are based on the contractor’s performance at the element level only (North 2007). Any liquidated damages are assessed after the entire calculation has taken place. The payments are calculated using the elements weight times the monthly bid. The monthly bid/invoice amount is simply all the unit price bid amounts times the quantities of each used during the month ($X per LF of Guardrail times 105 LF installed during Sept.). The element weight and monthly bid amount make up the “Element Value”. For example, in Table 19 the “Bridge Decks” element is weighted 0.0225

Table 19 - NCDOT: Sample Partial Payment Calculation (North 2007)
Used with permission by Jennifer Brandenburg

<table>
<thead>
<tr>
<th>BRIDGES</th>
<th>ELEMENT WEIGHT</th>
<th>TARGET ELEMENT POINTS</th>
<th>RATING</th>
<th>ELEMENT VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge Decks</td>
<td>0.0225</td>
<td>80</td>
<td>1.8</td>
<td>59.7</td>
</tr>
<tr>
<td>Superstructure</td>
<td>0.045</td>
<td>80</td>
<td>3.6</td>
<td>58.21</td>
</tr>
<tr>
<td>Substructure</td>
<td>0.045</td>
<td>80</td>
<td>3.6</td>
<td>74.63</td>
</tr>
<tr>
<td>Pipes &amp; Culverts</td>
<td>0.0225</td>
<td>90</td>
<td>2.025</td>
<td>47.19</td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>0.0075</td>
<td>90</td>
<td>0.675</td>
<td>99.87</td>
</tr>
<tr>
<td>Channel &amp; Slope Protection</td>
<td>0.0075</td>
<td>90</td>
<td>0.675</td>
<td>62.65</td>
</tr>
<tr>
<td>TOTAL</td>
<td>0.15</td>
<td>90</td>
<td>12.375</td>
<td>9.528</td>
</tr>
</tbody>
</table>
and the monthly bid was calculated at $100,000 (unit price x amount used that month); therefore, the element value would be $2,250.

If the contractor achieves the specified target for an element then he/she will receive the full element value as the payment for the month (Installed 105 LF and paid for 105 LF). In Table 19, the contractor was able to meet the target on retaining walls; therefore, the full element value at $750 will be paid out.

In contrast, if the contractor fails to meet the specified target there will be a graduated deduction scale on the element value. Here is how the disincentive scale works (North 2007):

- If performance on the element is 1-5 points below the performance target, the payment for that element will be 75% of the element value.
- If performance is 6-10 points below the performance target, the payment for that element will be 50% of the element value.
- If performance is greater than 10 points below the Performance Target, the contractor will receive no payment for that element.

In Table 19, the contractor performance for the “Substructure” element was 5.37% below the targeted 80%. This means the contractor will only receive 50% of the elements value; $2,250 instead of $4,500.

3.4 Area #3 – Performance-Based Contracting Results

3.4.1 Pilot Projects Results

The maintenance management conference proceedings found on the TRB website states that two completed assessments have occurred and one was currently underway during fall 2008. The second project assessment finished in the spring of 2008 (Arnold et al. 2009). As a general reference point, the conference proceedings were published in 2009. Since then there should have been more assessments; however, upon further review it was found that the project was terminated during its second year (Menches et al. 2010). Dr. Menches noted in her synthesis report that she had spoken with project personnel regarding the termination. The project personnel stated the contract was not as successful as hoped due to:

- Ambiguous Contract Language
- Performance Measures were too subjective
- Lack of a contractor Quality Control Plan
- Performance targets were not established correctly.

Additionally the NCDOT staff commented on lessons learnt and best practices. Below are some that were covered in Dr. Menches synthesis (Menches et al. 2010):

- Develop monitoring procedures for contractor’s daily performance, such as timeliness requirements.
- Conduct question and answer sessions with contractor community to gain advice and comments regarding procedures.
- Take time to ensure the right data collection technology is being used to help with efficiency and effectiveness.

The figures below show the results from the completed assessments up to spring 2008. Figure 17 compares the contractors rating versus the specified targets and Figure 18 shows a sampling of scores from the completed spring 2008 assessment. Contractor ratings have been improving since the contractor took over the project; however, targets are still not being met in various areas such as pavement markings, pavement markers, roadway lighting and sign lighting.
Overall, the contractor was able to meet 73% of the set targets according to the spring 2008 assessment (Arnold et al. 2009). Discussions on roadway and lighting elements took place between NCDOT and ICA after the spring 2008 results were published. After investigating potential causes for the low scores, the agency found that ICA was not completely to blame. The contract covered old sections of I-85 and I-77 and faulty underground wiring may have been the major factor with lighting failures (Arnold et al. 2009). Also in the contractor’s favor was the contract scope, the scope of work detailed the responsibility for lighting as “from the ground up”.

Figure 17 – NCDOT: Contractor Assessment (2007 - 2008) (Arnold et al. 2009)

Used with permission by Jennifer Brandenburg
Figure 18 – NCDOT: Spring 2008 Assessment results (Traffic/ITS) (Arnold et al. 2009)

Used with permission by Jennifer Brandenburg

After termination of the version 1.0 of the contract (the old 2007 contract), NCDOT decided to revamp the contract and tender. The scope in the new contract (version 2.0) was revamped and tendered in September 2009. The Charlotte, NC area was kept as the location for the version 2.0 contract. In January 2010, the contract was awarded to Transfield (ICA old contract) for approximately $23 million (roughly the same cost of the original contract). For more information on either contract, visit the links below.

- NCDOT Version 1.0 Contract:
  http://www.ncdot.org/doh/preconstruct/altern/design_build/Interstate/interstate.html

- NCDOT Version 2.0 Contract:
  http://www.ncdot.org/doh/preconstruct/altern/design_build/interstatediv10/interstatediv10.html#
Texas Department of Transportation
(TxDOT)
4 Texas Department of Transportation (TxDOT)

4.1 Maintenance Program Background

The Texas Department of Transportation’s (TxDOT) Maintenance Division has been outsourcing maintenance work for the past 30 – 40 years. Only within the past 10 – 15 years has the Maintenance Division been using broad scope performance-based contracts for its highways and facilities. The 9th Maintenance Management Conference proceedings by the Transportation Research Board discusses how TxDOT began maintenance contracting in the mid 1970’s on a select number of roadside mowing contracts (Graff 2001). TxDOT maintenance contracting began taking off during the 1980’s with larger scope contracts. According to the literature, contract scopes in the 1980’s involved multiple non-pavement related activities such as picnic and rest area maintenance, guardrails, raised pavement marking, striping as well as others (Graff 2001). During the 1980’s contracting expansion TxDOT accomplished two major milestones (Graff 2001):

- In 1986, TxDOT launched a “Preventive Maintenance” program for contracted light overlays and seal coats.
- In 1989, the Texas Legislature passed a bill with provisions requiring TxDOT to outsource at least 25% of their maintenance contracts.

These milestones help set the foundation for future outsourcing efforts by developing desired preventive maintenance standards and practices as well as driving maintenance personnel towards greater outsourcing initiatives.

In 1991, the Texas Legislature passed a contracting mandate similar to the one imposed in 1989. The 1991 bill raised the required outsourcing level for both preventive and routine maintenance contracts to 50%. The new mandated level was to be met by TxDOT on or before 1996 (Hyman 2009). The bill set an aggressive timeline pushing the agency to begin exploring larger contracting initiatives. TxDOT set out to achieve its new mandate of 50% by setting goals for each of its 25 districts. By 1996, TxDOT had successfully reached and exceeded the mandated level by outsourcing 52.1% of maintenance work in 1996.

Successful outsourcing of the mid 90’s coupled with industry advances in contracting methods led TxDOT Maintenance Division to another outsourcing milestone in 1999. In that year, the Maintenance Division launched its first two performance-based contracts ever for portions of interstate highway. The newly constructed contract was known as the “Total Maintenance Contract” (TMC). The contracts were for 60 miles (center-line) on I-20 in the Dallas District and 120 miles (center-line) on I-35 in the Waco District (Hyman 2009). These contracts were the largest let to date by the Maintenance Division and involved a substantially greater amount of risk transfer to the private sector than older method-based maintenance contracts. These pilot projects also marked the beginning of a performance-based contracting initiative for the agency. Prior to 1999, the maintenance contracts had been outsourced using traditional method-based specification contracts. The newly introduced performance-based contract (TMC) enabled the agency to specify their desired outcomes without having to dictate specific contractor means and methods. Many of the ideas that shaped these new TxDOT contracts came from other agencies already experimenting with performance-based maintenance contracts (i.e. VDOT).

TxDOT’s use of performance-based contracts for highway maintenance is still in effect today. The current contracts have evolved in various manners such as scope and performance evaluations since the pilot projects; however, the basic contract structure remains the same. Subsequent sections of this thesis will discuss the scope of services, performance evaluations and results for TxDOT’s original “Total Maintenance Contract” used in 1999 as well as the current performance-based contracts used by the Maintenance Division.
The Maintenance Division not only uses performance-based contracts for its highways but rest areas as well. In 2000, performance-based contracts were launched for Safety Rest Area maintenance. Safety Rest Areas were a perfect candidate for performance-based contracts because of their deteriorating conditions, variable location and large quantity. To simplify the contracting process for rest areas the division let four 2-year performance-based contracts (Hyman 2009). The four contracts split the state into different quadrants for rest area maintenance services. The red lines located in Figure 19 display the approximate boundaries for the four contracts. The Safety Rest Area program still utilizes the quadrant system today with the same boundaries; however, there are now five contracts. The north region was split into two contracts, “North Texas” and “Northwestern Texas”. Both contracts are currently held by ICA, Inc. All contract durations are still two years long with possible 2-year extension (maximum of 3 extensions).

4.2 Area #1: Scope of Services

4.2.1 Total Maintenance and Operations of Highways (Old Contract – Not In Use)

The use of the “Total Maintenance Contract” (TMC) by TxDOT for highway maintenance dates back to 1999 as previously discussed. The first two pilot projects (I-20 & I-35) used the original TMC performance contract and specifications for service delivery. The contracts were 5-year duration agreements with possible 3-year extension depending on contractor performance. Since the implementation of these first performance-based contracts there have been numerous other “offspring” contracts developed by the maintenance division and implemented throughout the state. These offspring contracts differ from the original by their scope size. It appears that TxDOT desired to remain in control of certain maintenance activities after the first two contracts. Some of the 25 districts in

Figure 19 – TxDOT: Quadrant system for Safety Rest Area maintenance (Graff 2004)
Used with permission by Neal Munn
Texas currently use these offspring contracts to suit their individual maintenance needs. Although smaller, the offspring contracts do resemble the original TMC’s in many aspects. Aspects such as performance specifications, payment structures, and reporting procedures are similarities to the 1999 pilot contracts. There are also new additions in the offspring contracts, which were non-existent in the old such as variable payment deductions based on inspection scores. It is important to note that the original TMC contracts were based upon the 1993 version of TxDOT maintenance specifications and the newer contracts were developed using updated 2004 TxDOT specifications. Before discussing the newer contracts there must be a basic understanding of what the original Total Maintenance Contract required. The old contract was officially titled, “Total Maintenance and Operations of Highways” and required the contractor to provide these services (Hyman 2009):

- Pavements
- Bridges
- Roadsides
- Traffic operations
- Traffic services
- Incident response
- Hazardous materials cleanup
- Emergency repairs
- Snow and Ice Control (Notification by TxDOT Engineer)

The contractor was also responsible for rest areas, picnic areas and weigh stations within contracting limits. The Total Maintenance Contract lays out specific performance specifications that must be met by the contractor in each of the required service areas. Embedded within some of the contract specifications are also timeliness requirements intended to prevent congestion and harm to traveling public. Timeliness requirement failures were met with liquidated damages applied to the contractor’s monthly payment. The contract also specifies work not under the contractor’s responsibility. Excluded works are:

- Courtesy patrols
- Traffic management devices (such as cameras, changeable message signs, Automatic Vehicle Identification readers/antennae, amplifier cabinets, detectors including acoustic, Vehicle Imaging Vehicle Detection, microwave, etc.)
- Agreements, such as utility permits, driveway permits, Multiple Use Agreements, construction and maintenance agreements, and other similar type agreements.
- Logo signing

For additional scope information, see the original “Total Maintenance and Operations of Highways” contract located in Exhibit C.1. Exhibit C.1 is a copy of the original (1993 based) specifications used on both pilot projects (I-20 and I-35). Exhibit C.1 can also be located at the TxDOT document database called “TxDOT Expressway”.

Performance-based contracts have spread throughout Texas since the first two contracts. District-level personnel with help from division staff have adopted and adapted the “Total Maintenance Contract” style for individual district maintenance needs. While researching online at the TxDOT Expressway, it was discovered that there are three main types of performance-based contracts currently in use for maintenance operations around the state. These three contract types are large in scope and cover multiple work areas just as the first contracts had back in 1999. To verify the online findings Tammy Sims, Special Projects Engineer at Maintenance Division was contacted regarding current performance contracts. Ms. Sims confirmed that the three main types found online were currently being used for maintenance operations. The three current contact variations are located in Table 20.
Each of the three current contracts is a variation from the original TMC contract. The contract number is important for locating the document in the TxDOT Expressway database. It is also the best way to locate project data when contacting district maintenance personnel. Each style of contract can be used throughout Texas; however, specific districts prefer to use one style or another based on preference and/or outsourcing capabilities. The locations given in Table 20 are the current districts using these types of contracts. It is important to reiterate that not all districts in Texas use performance-based contracts. Some districts prefer to use traditional contracts with private vendors or in-house resources. More information on district experiences and contract results will be given in the next section of this case study, “TxDOT Area #3: What are the reported benefits with using performance-based contracting as opposed to traditional contracting methods?”

In addition to the three main types of TxDOT performance-based contracts there are other smaller performance contracts being used for single maintenance activities. For example, there are contracts for only vegetation management and pavement marking maintenance. These smaller contracts are used by districts where agency personnel feel more comfortable using traditional method-based contracts for the majority of maintenance.

Prior to investigating the differences between VDOT and TxDOT contracts, work was done to uncover the contracting progression of TxDOT. Table 21 displays some discovered similarities and differences between the current three types of performance-based maintenance contracts and the original “Total Maintenance and Operations of Highways” contract used in 1999. The similarities and differences in Table 21 cover scope of services and other contracting aspects.

Due to the similar nature of all three current offspring contracts, only one of them will be used to explain the current TxDOT performance-based program. The representative or model contract chosen is the “Routine Maintenance and Operations of Highways” contract (Table 20). This contract serves as the best representation of how current performance-based contracting is run by TxDOT. This representative contract will also be used when comparing VDOT and TxDOT contracts side-by-side. The next section will describe the scope of services for this current TxDOT contract as well as compare its scope to the I-64 TAMS contract from VDOT.

Table 20 – TxDOT: Current Performance-Based Contracts (Texas 2011)

<table>
<thead>
<tr>
<th>Contract Name (Duration + Extension)</th>
<th>Contract #</th>
<th>Location/Texas District</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Based Roadside Maintenance of Highways (3 +2)</td>
<td>CSJ 6132-54-001</td>
<td>Yoakum District</td>
</tr>
<tr>
<td>Routine Maintenance and Operation of Highways (5 + 3)</td>
<td>CSJ 6202-14-001</td>
<td>Waco District</td>
</tr>
<tr>
<td>Performance-Based Maintenance of Highways (3 + 3)</td>
<td>CSJ 6146-71-001</td>
<td>Austin District</td>
</tr>
</tbody>
</table>
### Table 21 – TxDOT: Contracts Then and Now (1999 vs. 2011) (Texas 2011)

<table>
<thead>
<tr>
<th>Similarities</th>
<th>Differences</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Contract specifications list with embedded timeliness requirements.</td>
<td>- Old contract (Lump Sum) made monthly payments based on a “payment schedule”. New contract pays per lane mile. (Unit Price/Line Item)</td>
</tr>
<tr>
<td>- Both old and new contracts require contractor to assume Department maintenance responsibilities for existing agreements within contract limits (ex. Municipal Maintenance Agreements, Lighting Agreements, etc.)</td>
<td>- Old contracts have larger scope compared to new contracts. (Notably Rest Areas excluded from new contracts.)</td>
</tr>
<tr>
<td>- Monthly self inspections of assets by the contractor; results are reported to Department within one month.</td>
<td>- New contracts have greater detail on non-performance deductions. Old contract had flat deduction rate for non-compliance.</td>
</tr>
<tr>
<td>- Same general reporting requirements. (Work Accomplished, Highway Condition Reports, Complaints/Service Requests and Accidents/Incidents)</td>
<td>- New contracts include sample deduction calculations.</td>
</tr>
<tr>
<td>- Must follow Department Standards in numerous TxDOT manuals.</td>
<td>- New contracts include sample inspection forms.</td>
</tr>
<tr>
<td></td>
<td>- Third Party claims reimbursement procedures.</td>
</tr>
<tr>
<td></td>
<td>- New contracts have varying durations and potential extensions.</td>
</tr>
<tr>
<td></td>
<td>- New contracts give grace period for contractor to bring assets up to minimum standards.</td>
</tr>
<tr>
<td></td>
<td>- New contracts require work schedules and plans. (Not mentioned in 1993 specifications.)</td>
</tr>
</tbody>
</table>

### 4.2.2 Routine Maintenance and Operations of Highways (Current Contract)

The “Routine Maintenance and Operations of Highways” contract is currently used for interstate maintenance on the right-a-way for IH-35, IH-35E and IH-35W in Bell, Falls, McLennan and Hill Counties in the Waco District. The contracted length for maintenance services totals 115.3 center-line miles (~800 LM). Maintenance services for this portion of interstate highway have been procured using performance-based agreements for over 10 years due to positive results (Barron 2011). According to Dale Barron, Waco Maintenance Engineer, this maintenance agreement is currently being let for the 3rd consecutive time. The recent contract began in September 2010 and totaled $19.6 million dollars. Table 22 describes the scope of services for the “Routine Maintenance and Operation of Highways” contract and compares it to the current I-64 Culpepper TAMS. For additional details on scope of services see exhibit C.2, Appendix C.

### Table 22 – TxDOT: Contract Scope Comparison vs. VDOT TAMS (Texas 2011)

<table>
<thead>
<tr>
<th>TxDOT - “Routine Maintenance and Operation of Highways” Waco District</th>
<th>VDOT – New I-64 Culpepper TAMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scope (Included)</td>
<td></td>
</tr>
<tr>
<td>- Pavements</td>
<td>- Pavements</td>
</tr>
<tr>
<td>- Bridges</td>
<td>- Bridges</td>
</tr>
<tr>
<td>- Roadsides</td>
<td>- Roadsides</td>
</tr>
<tr>
<td>- Traffic Operations</td>
<td>- Traffic Operations</td>
</tr>
<tr>
<td>- Traffic Services</td>
<td>- Traffic Services</td>
</tr>
<tr>
<td>- Incident Response</td>
<td>- Incident Response (Includes removal and disposal of hazardous spills)</td>
</tr>
<tr>
<td>- Emergency Repairs</td>
<td>- Emergency Repairs</td>
</tr>
<tr>
<td>- Snow and Ice Control (Dictated by TxDOT)</td>
<td></td>
</tr>
<tr>
<td>Contractor has 2 hours to mobilize after notification. Payment is based on hourly rate.</td>
<td>Snow and Ice Control (Dictated by VDOT)</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td><strong>Scope (Excluded)</strong></td>
<td><strong>Scope (Excluded)</strong></td>
</tr>
</tbody>
</table>
| - Removal and disposal of hazardous materials and hazardous material spills.  
- ITS Cameras  
- Roadside Assistance (Courtesy Patrols)  
- Rest Areas  
- Dynamic Message Signs  
- Executing Agreements, such as utility permits, driveway permits, Multiple Use Agreements, construction and maintenance agreements, and other similar type.  
- *Preventative pavement maintenance not included. Let under a separate contract.* | - Environmental Sensor Stations (ESS) to include Roadway Weather Information Stations (RWIS). (electronic component only all other maintenance asset items included)  
- Traffic Counters, Highway Advisory Radio (HAR). (electronic components only) all other maintenance asset items included)  
- Changeable Message Signs (CMS) and associated electronics, power and communication infrastructure.  
- Traffic Cameras (electronic component only all other maintenance asset items included)  
- The installation and maintenance of Tourist Oriented Directional Signs (TODS), Supplemental, Logo and General Motorist Service signs are the responsibility of others.  
- Frontage roads  
- Weigh Station and weigh in motion station (building and supporting ancillary assets)  
- Open Safety Rest Areas, the building and grounds maintenance (except as noted above)  
- Superstructures and decks of overpasses (non-TAMS routes) |
| **Assets included (specifically named in contract)** | **Assets included (specifically named in contract)** |
| - Includes assets within the ROW; includes but not limited to, main lane roadways, frontage roads, shoulders, ramps, intersections, roadsides, bridges, picnic areas, weigh stations. | - Includes assets within the ROW; including  
- All Weigh Station drive through and parking areas  
- During snow and ice events, all open Safety Rest Areas’ drive thru’s (from entrance ramp through each parking area through the exit ramp of the Safety Rest Area.)  
- All bridge mounted signs on the overpass of the TAMS route(s), ramps, and interchanges.  
- Overpass bridges (on non-TAMS routes) over the transportation facility for emergency repairs and replacements only as a result of incidents or accidents.  
- Bridge substructure elements of overpasses (on non-TAMS routes) |
4.2.3 Performance-Based Rest Area Program

As discussed in section 4.1 TxDOT uses performance-based contracts for maintenance of Safety Rest Areas. This section will discuss the scope of services under a Rest Area agreement. To understand the Safety Rest Area scope, the “Facilities Safety Rest Area Program Supervisor” was contacted. Andy Keith, current supervisor, briefly discussed the program since its inception in 2000. Mr. Keith also forwarded a copy of a current contract specification. The current contracts are entitled, “Rest Area Total Maintenance, Operation and Repair” and can be seen in its entirety in Exhibit C.3 (Texas 2011). Here are the services required by TxDOT for performance-based Safety Rest Area maintenance under the current contracts:

- Janitorial Services
- Maintenance, repair and operation of buildings and grounds;
  - Vegetation/Landscaping
  - Signing and Lighting
  - Sidewalks, Curbs and Pavements
  - Striping and Raised Reflective Pavement Markers
  - Outdoor appurtenances including but not limited to arbors, barbecue pits, fireboxes, litter barrels, etc. (See specification for full list)
  - Drainage
- Water and Wastewater Facilities – contractor responsible for all department facilities servicing the Rest Areas (regardless of location; on or off the grounds).
- Emergency Operations – coordinate any closings with Department.

This total maintenance contract for rest areas resembles the total maintenance of highways contract because both require the contractor to assume all duties traditionally performed by TxDOT in maintaining the assets. The contractor is expected to fully understand these duties when accepting the facility.

4.3 Area #2 – Contract Performance Monitoring

During the researching process, information was obtained from various district offices throughout Texas including the main Maintenance Division located in Austin. Before discussing specifics on individual contract-specific monitoring approaches, there will be a review of the overall TxDOT Strategic Plan, TxDOT Tracker dashboard and Texas Maintenance Assessment Program (TxMAP). These three program areas are interrelated regarding the functions performed by the entire TxDOT agency and more specifically the Maintenance Division. Review of these programs is beneficial for understanding how the Maintenance Division helps the overall agency reach its goal of delivering high quality transportation services to the public.

Researching how TxDOT lays out their yearly plans and other strategic programs provides insight into various performance measurement strategies. Learning about other DOT driving forces could potentially benefit the current performance systems used by VDOT and their Maintenance Division.

4.3.1 TxDOT Strategic Plan

This plan is published by the “Texas Transportation Commission” every two years and outlines the agencies strategies and directions for the next five years. The plan enables the agency to ask, “Are we doing the right thing?” with relation to strategies and decision making on how resources are to be allocated. Within the plan are TxDOT’s vision and mission as well as all of the agency goals, strategies and tactics that will be enacted. Putting in place these goals, strategies and tactics provides a “roadmap” towards realization of both the vision and mission.

The focus of my research was on the “TxDOT 2009-2013 Strategic Plan”. This plan is directly linked to how the current TxDOT Tracker is set up as well as the TxMAP program used for gauging maintenance efforts. The 2009-2013 plans lays out five specific agency goals that are desired by TxDOT (Delisi 2008):
1. Reduce congestion
2. Enhance safety
3. Expand economic opportunity
4. Improve air quality
5. Preserve the value of transportation assets

To reach these five goals TxDOT formulated 26 various performance measures to gauge agency decisions and strategies. The purpose of the performance measures is to depict three major things: what the agency is currently doing, how well the agency is doing it, and what the plans are to improve. These performance measures can be viewed on the TxDOT Tracker dashboard system located at the agency’s website. Each performance measure has a hyperlink to a separate webpage devoted to that particular performance measure. Here at this devoted webpage the user can read about how the performance measure is compiled and reported on.

### 4.3.2 TxDOT Tracker Dashboard

The TxDOT Tracker promotes accountability and transparency by allowing results to be viewed by TxDOT personnel and any interested public bodies. The TxDOT Tracker is TxDOT’s version of the VDOT Dashboard. Twenty two of the 26 performance measures on the TxDOT Tracker fall directly under the five agency goals while the other four are external indicators. According to TxDOT’s 2010 Performance Report, these external indicators are outside the control of the agency but are worth reporting due to their impact on the transportation system (Saenz 2011).

For this research project, attention was paid to goal number five, “Preserve the value of transportation assets” because of its relation to maintenance works. On the main TxDOT Tracker dashboard, under goal five, there are four performance measures used to monitor and report on performance towards meeting the goal. The four measures under goal five are (Casteel 2010):

- *Pavement Condition* - % of pavement in good or better condition
- *Bridge Condition* - % of bridges in good or better condition
- *Roadway Surface Treatments* - # of actual lane miles surfaced compared to planned
- *Texas Maintenance Assessment Program* – Overall maintenance condition score (pavements, traffic operations, and roadside conditions) for the state highway system.

To view the entire list of agency goals and corresponding performance measures please see Exhibit C.4. Exhibit C.4 is a snapshot of TxDOT Tracker results from the “2010 Performance Results” report as published by the Strategic Policy and Performance Management Office in February 2011.

### 4.3.3 Texas Maintenance Assessment Program (TxMAP)

The TxMAP is a performance measurement program reported on the dashboard, which rates the level of service on the entire highway system. Developed in 1999 by TxDOT, this program helps meet the legislative accounting mandate, “Government Accounting Standards Board Requirement” #34 or GASB 34. The system also acts as a tool for the legislature’s appropriations bill in addition to being used as a budget allocation. The level of service rating published by TxMAP is based upon the evaluation of three main roadway components: pavement, traffic operations and roadside. Each year TxMAP officials choose to inspect around 4,000 center-line miles of roadway out of Texas’s approximately 79,849 centerline miles. The inspection sites are one center-line mile long segments throughout the various 25 Texas districts. Every year approximately 10% of interstate roads and 5% of other highways are inspected under TxMAP. It is important to note, that segment samples are taken on roadways regardless of who is maintaining them. Inspection sites are chosen randomly and can fall upon roads maintained by either state forces or outsourced forces (traditional and performance-based contracts).
While researching the TxMAP program, I contacted via phone Ms. Brandye Munn at the TxDOT Maintenance Division. She provided information regarding the current state-of-practice for TxMAP. According to Ms. Munn, in FY 2010, TxMAP inspected 3932 centerline miles of roadway throughout the state. Inspectors audited 309 miles of interstate roadway out of the 3932 miles.

As stated previously, the TxMAP inspectors rate the roadway condition in three different component categories (pavement, traffic and roadside). Each of the three components are given a different weighting factor (0-100%) based on importance to the overall score. All three-component percentages add up to 100%. Along with the three overall components there are 21 roadway elements split up under each of the three components. Elements have their own weighting factors called a “priority-multiplier”. Listed below are the current 21 elements under each component. The two red highlighted elements were part of the inspections; however, they were recently removed by TxMAP. Notice that under pavement there are two options depending on the inspection site surface (Asphalt or Concrete) (Munn 2008):

- **Pavement (50%)**
  - Elements for Asphalt or Concrete Pvmt: Rutting, Cracking, Failures, Ride, Edges, Shoulders
- **Traffic Operations (25%)**
- **Roadside (25%)**
  - Vegetation Management, Litter, Sweeping, Trees and Brush, Drainage, Encroachments, Guard Rail, *Guard Rail End Treatment, Mail Boxes, General Public Rating.

Below is key which relates the terminology used by TxDOT to that of VDOT:

- **TxDOT Components = VDOT Asset Groups**
- **TxDOT Elements = VDOT Asset Items**
- **TxDOT priority multipliers = VDOT weighting factor**

During the inspection of elements, ratings are given based upon the conditions seen. Inspectors rate the element condition on a 1 thru 5 scale; 1 (being the lowest) and 5 (being excellent). Table 23 shows a sample of the current TxMAP Scoring System description sheet used by inspectors. The full TxMAP description table for roadway elements can be seen in Exhibit C.5. Exhibit C.5 was provided by Ms. Munn via email and serves as the current evaluation criteria (as of 2011) used by TxMAP inspectors.

<table>
<thead>
<tr>
<th>Component</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Pavement</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Rutting (Do not count associated with FAILURES)</td>
<td>No rutting</td>
<td>Minor &lt; ¼” Flushing, Rock wearing</td>
<td>Moderate (¼” to ½”) May be able to feel when crossing in vehicle</td>
<td>Major (&gt; ½” to 1”)</td>
<td>Severe (&gt; 1”)</td>
</tr>
</tbody>
</table>

During inspections, the assessors use Table 23 in conjunction with the “Texas Maintenance Assessment Inspection Report” form located in Figure 20. Figure 20 shows only one component and sample calculation for an inspection site. To view the entire completed inspection form and all sample calculations go to Exhibit C.6 in Appendix C. It is important to note that bridges are not inspected under TxMAP system; they are inspected separately under other federal guidelines. There is a separate yearly inspection for bridges.

Once all inspections have taken place, the TxMAP officials gather the data and formulate a final bar chart. The final bar chart is published on the TxDOT Tracker website under the Texas Maintenance Assessment Program.
performance measure. To view the interactive chart simply click the hyperlink on the dashboard. Figure 21 is a snapshot from the website of what will appear. When using the online interactive chart, the user can choose to either view LOS data for the entire state or one of the 25 districts. The chart also displays data over multiple years so trends can be seen. The data for each year is split into two bars, one for interstates and the other for non-interstate highways.

Figure 20 – TxDOT: Sample TxMAP Inspection form (Munn 2011)
Used with permission by Neal Munn

<table>
<thead>
<tr>
<th>COMPONENT/ELEMENT</th>
<th>RATING</th>
<th>COMMENTS</th>
<th>ELEMENT SCORE</th>
<th>PRIORITY MULTIPLIER</th>
<th>COMPONENT SCORE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Lane - Rutting</td>
<td>4</td>
<td></td>
<td>80%</td>
<td>6.5</td>
<td>5.20</td>
</tr>
<tr>
<td>Main Lane - Cracking</td>
<td>5</td>
<td></td>
<td>100%</td>
<td>6.5</td>
<td>6.50</td>
</tr>
<tr>
<td>Main Lane - Failures</td>
<td>4</td>
<td></td>
<td>60%</td>
<td>9</td>
<td>7.20</td>
</tr>
<tr>
<td>Main Lane - Ride</td>
<td>4</td>
<td></td>
<td>80%</td>
<td>6</td>
<td>4.80</td>
</tr>
<tr>
<td>Edges</td>
<td>5</td>
<td></td>
<td>100%</td>
<td>4.5</td>
<td>4.50</td>
</tr>
<tr>
<td>Shoulders</td>
<td>5</td>
<td></td>
<td>100%</td>
<td>5</td>
<td>5.00</td>
</tr>
</tbody>
</table>

Pavement Component Score: 33.20 / 37.50 = 88.53%

The current TxMAP program used by the overall maintenance division is also used at the district level for monitoring performance of individual maintenance projects. Project level assessment is conducted using a system known as “Modified TxMAP”. The Modified TxMAP uses the same framework and roadway components as the overall state-wide TxMAP program. The only difference is that Modified TxMAP makes modifications with inspection criteria. Some maintenance projects may not be inspecting all 21 roadway elements while others may do

Figure 21 – TxDOT: TxMAP LOS Chart (2000 - 2010) (Casteel 2010)
Used with permission by Neal Munn
so. Each maintenance project can have a different Modified TxMAP depending on project scope. The next section will detail how performance criteria is laid out and how assessments (Modified TxMAP) take place on the current representative contract; “Routine Maintenance and Operation of Highways” out of Waco, Texas. The section will also compare the TxDOT contract to the VDOT TAMS in terms of performance criteria and assessment.

4.3.4 Performance Specifications & Assessment: Routine Maintenance and Operation of Highways (Current Used Contract)

In the TxDOT contract there is a section called “Performance Standards” where all minimum asset conditions are specified. The “Performance Standards” section is TxDOT’s version of the “Performance Criteria” section in a TAMS contract. Listed below are the headings and subheadings in the TxDOT “Performance Standards”. Notice that next to the headings and subheadings are VDOT specification equivalents. In an attempt to compare VDOT and TxDOT specifications both contracts were analyzed to locate some similarities and differences between the specifications. For example, the specification for “Vegetation Management” in the current TxDOT contract is the equivalent to the “Mowing/Vegetation Control” specification in the TAMS contract. Equivalent not in terms of the exact wording and requirements but simply that each agency has covered that particular work area in their contract. By listing similarities in the specifications it can been seen where TxDOT and VDOT contracts meet on areas of work required. In addition, providing these equivalents can potential help VDOT adopt addition requirements no yet used in TAMS contracts.

Below are the specification headings and subheadings for the Routine Maintenance and Operation of Highways contract by TxDOT (VDOT headings in red highlight):

- Routine Pavement Maintenance
  - Asphalt Surfaces (Travel Lanes and/or Shoulders)
  - Concrete Pavement (Travel Lanes and/or Shoulders)
- Roadside Maintenance = TAMS Asset Group “Roadside”
  - Concrete Traffic Barrier
  - Vegetation Management = “Mowing/Vegetation Control”
  - Exit and Entrance Gore Areas
  - Landscaped Areas
  - Channel Easements and Retention Ponds
  - Litter and Debris Pickup = “Debris & Road Kill” + “Litter”
  - Graffiti Removal (Asset Group: Services
  - Picnic Areas
  - Tree and Brush Control = Brush and Trees
  - Drainage = TAMS Asset Group “Drainage”
  - Guardrail and Cable Barrier Systems
  - Impact Attenuators
  - Removal of Illegal Signing and Other Encroachments
  - Mailbox Installations
- Bridge Maintenance
  - Overall Bridge
  - Railing
  - Deck
  - Superstructures
  - Substructures
  - Channels
  - Embankments
- Traffic Operations Maintenance
- Signals
- Traffic Signal Detection
- Signs (includes small signs, large signs, overhead signs)
- Highway Lighting
- Pavement Graphics
- Striping
- Raised Reflective Pavement Markers (RRPM)
- Overhead Sign Structures
- Object Markers and Delineators
- Emergency Maintenance
- Snow and Ice Control – special specification used; see Exhibit C.7
- Incident Management and Debris in the Roadway

As mentioned in section 4.3.3 the TxMAP inspections at the Maintenance Division level may or may not sample from this project on a yearly basis. In order for district level officials to monitor contractor performance on this contract there is a Modified TxMAP used in conjunction with other assessments. To ensure specification compliance Waco District officials require four types of inspections on this contract:

- Monthly inspections conducted by the contractor and submitted to the department within one month after completed assessment (Includes night inspections as per specifications).
- Monthly inspections by Department known as “Modified TxMAP Inspections”.
- Weekly bridge inspections by the contractor to address any repair needs.
- Yearly bridge inspections conducted by the overall Maintenance Division for the project.

The Modified TxMAP inspection samples one mile length segments in an amount that equals at least 10% of the length of all roadways under the contract including frontage roads and both main lanes. The specification states that pavement maintenance is under the direction of TxDOT and not the contractor; therefore, various pavement elements (rutting, ride and shoulders) will not be assessed during the monthly Modified TxMAP inspections. To view the Modified TxMAP inspection form and sample calculations see exhibit C.2; page 22 and 23 in the contract.

Incorporated within the Modified TxMAP are various grace periods allotted to the contractor for raising component and element conditions to minimum service levels. The reasoning behind the grace periods was to avoid over penalizing the contractor for conditions not within their control. For example, if the contract had previously been under a different contractors control the new incoming contractor would be unjustly penalized at the start of the contract. The grace periods were only given on the first and second letting of the “Routine Maintenance and Operation Highways” contract since there was a new contractor each time. Now in its third administration, the contract no longer has grace periods since the contractor currently awarded was the same contractor awarded during the 2nd letting. The contractor was expected to maintain the highway at the start of the contract. For the full list of allotted grace periods which were used see page 21 of exhibit C.2, appendix C.

Notable differences between TxDOT and VDOT specifications and performance assessments:

- Highway Lighting – TxDOT has specifications including timeliness requirements; however, there is no lighting line item on the inspection form. VDOT has a line item for lighting in the inspection form.
- Drainage – TxDOT has only one small specification section. VDOT devotes an entire asset group to it.
- Complaints/Service Requests – TxDOT requires the contractor to report monthly on all complaints.
- Liquidated Damages – TxDOT has single deduction amount for any “Performance Standard” not met in a specified period. The specified timeframe can either be listed in the specification or determine by the Engineer. The flat rate used by TxDOT is a considerable difference from VDOT’s table of LD’s
for timeliness requirements.

- The deductions are calculated differently for evaluations. Deductions by TxDOT account for total lane miles in the project. Instead of using a range of percentages to find percent of total contract value deducted (TAMS way), TxDOT accounts for each percentage the contractor is below the minimum standard. TxDOT then takes the amount away from the contractors monthly payment. TxDOT does not have a deductions cap.

- TxDOT evaluation criteria for inspections are more subjective with the 1 thru 5 rating scale versus a Yes or No standard used by TAMS.

- Inspection Frequency – TxDOT has monthly inspections of assets as compared to TAMS MRP.

4.3.5 Payment & Non-performance Procedure: Routine Maintenance and Operations of Highways (Current Contract)

In the original TMC contracts back in 1999, the monthly payments to the contractor were based upon a percentage schedule provided in the contract. The monthly payment equaled the lump sum bid times the given monthly percentage. The current representative contract does not have a payment schedule and payments are based per lane mile of work completed every month. Payments are made to the contractor based on the unit price bid submitted.

Non-performance procedures used by the original TMC’s are quite different than those used by the current representative contract. The old contract handled non-performance with monthly payment deductions calculated by the departments’ engineer. The old TMC specifications stated that if the engineer determines the contractor is not meeting standards or following the contract correctly that he may order corrective work to be performed. The cost of this work will be deducted from the contractor’s monthly payments. Additionally there was a $5000 dollar per working day liquidated damages provision while the corrective work is taking place. For non-compliance the Engineer could issue a notification about a failing standard as well as demand the contractor fix it to avoid liquidated damages. The engineer could also issue a notice that an emergency contract is being let to fix a failing standard; therefore, removing the current contractors ability to fix his/her own failure.

The new contract has a much more descriptive process for how non-compliance is handled. The new contract specifically states that the Engineer would provide a timeframe for the contractor to correct the failure. If not corrected, liquidated damages would take effect after the time period expired. Liquidated damages are calculated in accordance with a “Schedule of Liquidated Damages” located in a TxDOT special provision. Special provision 000-1493 located on the TxDOT website shows liquidated damages are calculated as a function of contract value. This method of calculation was not in effect back when the first two pilot contracts were let in 1999. Figure 22 is a snapshot of this schedule. The current contract being let in Waco was valued at $19.3 million which makes the liquidated damages total $1550 per working day for any standards not met.

Monthly payments due to the contractor are not only subject to a fixed liquidated damage amount but also subject to a variable amount based on assessment results. If the contractor fails to meet minimum asset level targets during the monthly Modified TxMAP inspection then additional damages will be taken. After the data from an inspection is collected the element, component and overall level of service is calculated and compared to the minimum standards. On the current contract deductions only take place at the element and component level. All elements must be at least 70% and components 80% as stated in the contract. The overall minimum score is not specified in the representative contract. Table 24 is the “Reduced Compensation” chart used to calculate monthly deductions after inspection has taken place.
The following is an example of a payment deduction using the formulas given in Table 24. If an inspection showed the contractor scored 65% in the “Cracking” element then the monthly deduction would be as follows: $2.00 \times (70-65) = 5 \text{ points below} \times 800 \text{ LM (miles in contract)} = $8000 \text{ total penalty.}

Two other notable liquidated damages associated with this contract are:

- “Failure to Re-Open Main Lanes Closed for Maintenance Work” = $8,000 per hour, per lane closed.
- “Failure to Respond to Snow and Ice Control” = $16,000 per hour (after TxDOT notification)
4.3.6 Performance Specifications & Assessment: Safety Rest Area program

The Safety Rest Area contract provided by TxDOT outlines various methods and standards that must be upheld during maintenance operations. The “Work Methods” section of the Safety Rest Area specification is the equivalent of the “Performance Standards” section in the “Routine Maintenance and Operation of Highways” contract. The department conducts unannounced inspections for the Safety Rest Areas. The contractor is rated in the following categories over approximately 73 elements:

- Traffic/Pavement/Markings 10%
- Grounds 10%
- Outdoor Fixtures 15%
- Building 10%
- Rest Rooms 50%
- Attendants 5%

4.3.6.1 Payment & Non-performance Procedure: Safety Rest Area program

The contracts include incentives and disincentives depending on the inspection score outcomes (Graff 2004). Please see Exhibit C.3 for details. Deductions are made to the contractor’s daily payments. Score ranges are:

- Below 75% → Unacceptable; 200%/Day Reduction
- 75% – 79.99%, 150%/Day Reduction
- 80% - 84.99%, 100%/Day Reduction
- 85% - 89.99% → Acceptable; no increases or decreases to payment.
- 92 or >, 15%/Day Increase

4.4 Area #3 - Performance-Based Contracting Results

4.4.1 Total Maintenance Contract projects

The pilot project contracts let in 1999 had mixed results (Waco vs. Dallas). The contracts were let for only one year and then terminated. Upon speaking with Dallas district, they mentioned the contract was not seeing good results and therefore terminated.

4.4.2 Current three types of Performance Contracts

The representative contract used from Waco, Texas was the only large scope performance-based contract found to have good results. Mr. Barron (Waco Maintenance) mentioned that the contract had been going well and was being let for the third consecutive time for I-35. According to Mr. Dale Barron, Waco District is the most active performance-based maintenance-contracting district. Other districts have chosen not to use the agreements do to either bad experiences or lack of knowledge with the contracting method (Barron 2011).

As for the other two contracts, both had not seen good results.

- Performance Based Roadside Maintenance of Highways (3+2) – Cancelled due to high incoming bids. Estimate was less than bids so the district decided to pursue other contracting methods to save money.
- Performance-Based Maintenance of Highways (3+3) – Executed for one year only then terminated due to poor performance according to the district.
4.4.3 Safety Rest Area contracts

Andy Keith, Safety Rest Area supervisor, mentioned that safety rest areas had been in poor condition prior to using performance-based contracts. Complaints from customers were a frequent occurrence at various facilities prior to performance contract implementation. Since implementing the performance-based approach, the program has seen almost no complaints according to Mr. Keith. The level of service is higher than it ever was before 2000. Mr. Keith felt that incentives for good performance contributed to the high level of services delivered.
Florida Department of Transportation
(FDOT)
5 Florida Department of Transportation (FDOT)

5.1 Maintenance Program Background

The FDOT maintenance office began using performance-based maintenance contracts in 2000 (Hyman, 2009). Driven by other DOT’s and the potential for cost savings, FDOT decided to dive into this innovative delivery method. The department calls their performance-based contracting program “Asset Maintenance” and applies this type of contracting style to various facility types not just interstates. Asset Maintenance contracts are being used throughout all of Florida’s 7 districts and even by the Florida Turnpike Enterprise. Figure 23 is a geographical map of Florida showing the locations of all districts including the turnpike enterprise.

Figure 23 – FDOT Districts & Turnpike Enterprise (Florida 2011)
Used with permission by Mike Sprayberry

Florida’s first performance-based contract was located across multiple districts for portions of interstate 75 (253 center-line miles) between Miami and Ocala. The 7-year contract was awarded to Infrastructure Corporation of America Inc. (ICA) in July of 2000 for approximately $73.5 million dollars (Hoffman et al. 2010).

Since the first contract was administered in 2000, the contracting program at FDOT has greatly expanded. Between 2000 and 2005 the maintenance office let 22 Asset Maintenance contracts totaling approximately $672 million (Hyman 2009). Since 2005 there have been numerous other contracts let using the Asset Maintenance system.

As mentioned previously the term “Asset Maintenance” describes FDOT’s performance-based contracting program. Within the Asset Maintenance program there are 3 main types of performance based contracts (Florida 2011):

- Asset Maintenance Contracts (AM) – main contract used by the program. Largest performance-based category of contracts and most risk transfer to the private sector (5 -10 year durations).
- Best Value Performance Contracts (BVP) – BVP contracts are similar to AM contracts, but usually with shorter terms, small budgets and more focused on specific activities.
• Low Bid Performance Contracts (LBP) – similar to BVP but shorter term and no RFP process; which both AM and BVP contracts use.

The focus of this research will be on the largest performance-based contract type, the Asset Maintenance (AM) contracts. The Asset Maintenance contracts can be further broken down into three different types for various applications. AM contracts are let in the following manners (Florida 2011):

• Corridor style contracts focused on a core roadway (Similar to TAMS contracts).
• Geographic contracts with multiple transportation facility types covering entire counties, Districts, or defined regional boundaries (Similar to England’s MAC contracts).
• Limited Focus contracts geared exclusively toward facilities (rest areas, weigh stations, welcome centers) or structures (fixed bridges, movable bridges) (Similar to TxDOT contracts for Rest Areas).

5.2 Area #1: Scope of Services

5.2.1 Asset Maintenance Contracts

This section will discuss the scope of services for all three types of Asset Maintenance (AM). The BVP and Low Bid contracts under the FDOT’s maintenance program were not researched. In contrast to BVP and LBP contracts, AM contracts are developed using an online “Scope Customization Program”. The program was developed by the Office of Maintenance as a means to standardize the scope of services across all 7 districts. The system aims to promote contract consistency state-wide according to the documents on FDOT’s Asset Maintenance homepage. The system allows district contract managers to choose a variety of service options based on need in a menu format. The contract managers will choose the service options they want to include in the contract depending on maintenance needs. Once the contract is customized on the online database, it is sent to the main Office of Maintenance for review and approval.

As mentioned above there are three main types of AM contracts used by FDOT. Although these contracts are different, they collectively follow the same set of specifications and contract conditions. The only difference is that certain performance specifications may not apply. For example, a limited focus contract for Rest Area maintenance would not include inspection of bridges or highway lighting. In general an AM contract may require either some or all of the following areas of maintenance (Hyman 2009):

• Routine and Periodic Maintenance within ROW (for these areas):
  o Roadside Mowing
  o Clearing and Grubbing
  o Roadside Litter/Debris Removal
  o Road and Bridge Sweeping
  o Edging and Sweeping
  o Flexible Pavement
  o Canal Cleaning and Grading
  o Inlets, Manholes and Junction Boxes
  o Desilting Pipes and Box Culverts
  o Concrete Gutter, Curb Elements and Traffic Separator
  o Concrete Sidewalk
  o Guardrail
  o Vehicular Impact Attenuators
  o Fencing
  o Turf Management (Performance)
  o Fertilizing
- Shoulders, Slopes and Roadside Ditches
- Chemical Vegetation Control
- Tree Trimming and Removal
- Highway Signing
- Highway Delineators
- Retro-Reflective Pavement Markers
- Existing Painted Traffic Stripes/Markings
- Existing Thermoplastic Traffic Stripes/Marking
- Highway Lighting System
- Call Boxes
- Asset Database Management (Update RCI inventory when assets change)
- Environmental compliance
- Incident response services
- Traffic Services
- Natural disaster preparedness
- Inspection of bridges
- Motorist aid service patrols
- Customer Service and Complaint Resolution
- Coordination, processing, administration, and inspection on all permits on the roadways
- Intelligent Transportation Systems (ITS)
- Rest Areas, Weigh Stations, Welcome Centers or Way Side Parks

AM contracts require the services listed previously on interstates and other smaller state roads. Table 25 displays examples of current contracts under each of the 3 types of AM contracts. AM contracts have the option to include rest areas and other special facilities in their contract. This inclusion contrasts other agencies such as VDOT and TxDOT whom prefer to let Rest Area maintenance separately. FDOT’s use of AM performance-based contracts on non-interstate roads is another unique characteristic compared to other agencies. Most agencies use performance-based contracts on Interstates only.

Table 25 – FDOT: AM Contract Examples (Florida 2011)

<table>
<thead>
<tr>
<th>Asset Maintenance (AM) Contracts</th>
<th>Example Contract</th>
<th>Location</th>
<th>Contract Value</th>
<th>Term</th>
<th>Length (Center-line miles)</th>
<th>Works &amp; Facilities Included</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corridor Style</td>
<td></td>
<td>E1G23</td>
<td>~$93.5 mil</td>
<td>7+7</td>
<td>~253</td>
<td>Interstate Maintenance + 8 = Rest Areas &amp; 2 = Weigh Stations</td>
</tr>
<tr>
<td>Geographic Style</td>
<td></td>
<td>BD049</td>
<td>~$37.9 mil (renewed price)</td>
<td>7+7 (ext.) Renewed in 2008</td>
<td>~427</td>
<td>Maintenance on all state primary and interstate roads + 1 = Way Side Park</td>
</tr>
<tr>
<td>Limited-Focus Style</td>
<td></td>
<td>BD341</td>
<td>$64.4 mil</td>
<td>10+10 (ext.)</td>
<td>n/a</td>
<td>(Facility Maintenance Only) Rest Areas = 17 Weigh Stations = 6 Welcome Centers = 2 Scales Facilities = 7</td>
</tr>
</tbody>
</table>
A sample-customized scope is provided in Exhibit D.1. All possible solicitation options for an AM contract were chosen in online “Scope Customization Program” so all aspects could be seen; including Bridge, Rest Area and other assets. To reiterate, a computer-based customized scope system has allowed FDOT easier contract generation and promotes consistency across districts.

5.3 Area #2 - Contract Performance Monitoring

To ensure that contractors are adhering to pre-defined maintenance standards, the Office of Maintenance uses a wide range of performance standards along with numerous non-compliance penalties. On Asset Maintenance contracts the contractor’s performance is evaluated in two ways:

   http://www.dot.state.fl.us/statemaintenanceoffice/MaintRatingProgram.shtml

2. AM Monitoring Plan/Contractor Evaluation System – semiannual grade given to the contractor which evaluates performance on areas such as quality (Newly enacted program @ FDOT).

5.3.1 Maintenance Rating Program (MRP)

The MRP program is overseen by the Office of Maintenance to track AM contract performance. Evaluations are conducted three times per year, in each district throughout various cost centers. A cost center is a maintenance office in charge of various facilities within the district. Cost centers are each responsible for a combination of five facility types: rural limited access (RLA), rural arterial (RA), urban limited access (ULA), urban arterial (UA) and special facilities. The special facilities are not calculated in the MRP program (separate inspections). The inspection results are added in after the LOS for the four roadway types is completed. Here are the definitions for all facility types (Florida 2011):

- **RURAL LIMITED ACCESS** – Interstate, toll and other limited access roadways that have adjacent property unimproved, agricultural, low-density population, industrial and light commercial development.
- **RURAL ARTERIAL** – All other rural roadways not covered above that have adjacent property unimproved, agricultural, low density population, industrial and light commercial development.
- **URBAN LIMITED ACCESS** – Interstate, toll and other limited access roadways that have adjacent property of high-density population, industrial and heavy commercial development.
- **URBAN ARTERIAL** – All other urban roadways not covered above that have adjacent property of high-density population, industrial and heavy commercial development.
- **SPECIAL FACILITIES** – Rest Area, Weigh Stations, etc. (Not included in MRP calculations).

Each of the four roadway facilities are evaluated based on five different maintenance elements (same as a TAMS asset group). Each of the elements are further broken into features and characteristics (asset items) which are the inspected items. The asset groups and respective features can be seen in Figure 24. The elements have been linked with FDOT’s MRP program goals.

AM contracts can be written in manner where the department or contractor is responsible for the MRP evaluations. However, evaluations are conducted predominately by FDOT district staff to maintain objectivity. District’s use evaluation teams of two, and inspections are conducted on foot to ensure thorough evaluation. The inspections take place on 1/10th mile segment samples chosen by a random number generator. MRP sample sites are chosen so that at least 30 sites per facility per cost center is chosen. All sample sites are generated by the main Office of Maintenance. If a new asset maintenance contract is let, the information is sent to the head Office so the MRP program can account for the added facilities. The newly added information in the database allows sites within this contract to be sampled for inspection. Upon speaking to FDOT Maintenance, it was learned that AM contracts
are treated as their own “Cost Center”. This allows all five-facility types to be inspected for that particular contract (Sumner 2011).

To reflect the importance of various asset groups and group elements, the MRP program has different weighting factors. Each of the five asset groups is given a rating between 0 and 100. Each of the features is given a weight between 0 and 9. An overall MRP score of 80% is required by FDOT.

5.3.2 Asset Maintenance (AM) Contractor Performance Evaluation Report (AMPER)

In order to gain a holistic view on the contractor’s performance FDOT has developed a new semi-annual evaluation. The “AMPER” evaluation acts an additional monitoring aid to the MRP evaluations (3x per year). The AMPER consists of five different possible evaluation areas which make-up the contractor’s total score. AMPER sections include both qualitative and quantitative data:

- Section 1 – AM Performance Measures (47 standard + 7 project specific = 54) (22%)
- Section 2 – Rest Areas (20%)
- Section 3 – Structures (23%)
- Section 4 – MRP (20%)
- Section 5 – Evaluation (15%)

Figure 24 - FDOT: MRP Elements & Features (Hosani and Khalafallah 2008)
Sections two through four are optional and the evaluator must check off whether the section is applicable to their contract. The three areas, two through four, are optional since some AM contracts do not include particular structures or facilities. Each section is weighted as part of the overall total score. Weights will change depending on what options are included. For example, if all five areas check off then weights are as listed in the previous paragraph list (%). Figure 25 is snapshot from the AMPER user guide provided by Mr. David Sumner which shows Section one. Section one has 54 total Y or N performance indicators which fall under four various performance categories.

To view the entire user guide please see Exhibit D.2 of Appendix D. The user guide explains various methods behind the performance indicators and data that make up each section of the AMPER.

![Figure 25 – FDOT: AMPER Evaluation - Snapshot of Section 1 (Sumner 2011)](Used with permission by David Sumner)

5.3.3 AM Contract Payment & Non-performance Procedures

The lump sum contract is paid using a payment schedule (fixed payments) instead of paying for work accomplished in a given month like the I-64 TAMS contract. Before payment is made to the contractor the Department must assess whether any deductions must be made. There are a variety of deduction areas depending on the scope of services in the contract. The MRP evaluation deductions include retainage amounts to encourage the contractor following a negative evaluation. The Department can retain contract funds in either of the first two yearly evaluations; if the contractor fails to meet targets. The contractor may receive the retained amount back; however, it depends on the final annual MRP score (average of all three evaluations). If the annual MRP score yields an annual deduction amount exceeding the combined retainage from evaluations one and two, then the Department keeps the years retainage. In addition to the retainage, the Department will penalize the contractor with the annual deduction amount. See Error! Reference source not found., which displays a detailed description on the MRP deduction methodology. This table was taken from the sample scope provided by Mr. David Sumner. In addition to the MRP, deductions there are other deductions categorized by either maintenance element (i.e., Guardrail) or a particular service area (i.e., Customer Service Resolution). Table 26 displays the schedule which varies the percentages depending on the year (schedule was split across two pages and combined for viewing purposes in this report).

Table 27 on the next page shows the deductions for highway lighting deficiencies. The full list of deduction categories can be seen in exhibit D.1.
Table 26 - FDOT: AM Payment Schedule (Sumner 2011)
Used with permission by David Sumner

<table>
<thead>
<tr>
<th>Month</th>
<th>Contract Year 1</th>
<th>Middle Contract Years</th>
<th>Final Year of Original Term</th>
<th>Each Renewal Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.100</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>2</td>
<td>0.100</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>3</td>
<td>0.075</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>4</td>
<td>0.075</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>5</td>
<td>0.075</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>6</td>
<td>0.075</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>7</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>8</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>9</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>10</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>11</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>12</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
</tbody>
</table>

Table 27 – FDOT: Example Deduction Criteria for Non-compliance (Sumner 2011)
Used with permission by David Sumner

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Unsatisfactory</td>
<td>Per Procedures, Manuals, Codes, and Per Performance Lighting Specifications (Standard Maintenance Special Provisions)</td>
<td>$5,000 per survey identifying excessive outage</td>
</tr>
<tr>
<td>Department lighting outage survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Failure to make temporary safety repairs resulting from Incidents</td>
<td>Must secure public safety from hazards and establish proper MOT before leaving the site</td>
<td>$1,000 per day per light pole</td>
</tr>
<tr>
<td>c. Failure to replace light poles damaged by Incidents</td>
<td>Per Performance Lighting Specifications (Standard Maintenance Special Provisions)</td>
<td>$500 per day per light pole</td>
</tr>
</tbody>
</table>
Additional performance criteria areas, which have deductions for non-compliance, include:

- Permits
- Call Boxes
- Welcome Centers, Rest Areas and Way Side Parks
  - Security Performance Criteria (includes Guard Criteria)
  - Utility Bill Payment Performance Criteria
- Weigh Stations excluding scales
  - Utility Bill Payment Performance Criteria
- “Road Ranger Service” Patrol
- Bridge Maintenance Performance Criteria
- Overland Sign Structure Inspection and Maintenance
- High Mast Light Structure Inspection Performance Criteria

5.4 Area #3 - Performance-Based Contracting Results

Currently the AMPER program has been going well according to Mr. Mike Sprayberry, Asset Maintenance Director at FDOT. Mr. Sprayberry mentioned that no deductions are attached with AMPER scores; however, the outlook is to make AMPER scores part of the Asset Maintenance (AM) bid process. Using the quality score as part of the technical proposal evaluation would help prevent poor performing contractors from continuing to work in Florida.

Mr. Sprayberry also mentioned that required partnering sessions have been included in the AM contracts. There is a line item in the bids where contractors allot money for sessions. Each session takes place between FDOT and contractor personnel while facilitation is handled by a board. This strategy has proven very useful according to district managers (Sprayberry 2011). See exhibit D.1 for information on the newly added partnering aspect.

5.5 FDOT Timeline

FDOT’s evolution with innovative project delivery began with design-build legislation in 1987. The program had great success, which moved the Florida legislature to allow design-build and innovative project delivery around 1995. In 1996 design-build authority at FDOT expanded allowing wider arrays of deliver methods. The 1996 procurement law expansion resembles the 1995 Public-Private Transportation Act (PPTA) in Virginia.

While constructing the FDOT timeline it was found that FDOT has an auditing agency similar to VDOT. In Virginia, the JLARC review agency and the Florida Office of Program Policy Analysis and Government Accountability or OPPAGA have similar responsibilities for reviewing various state programs. The OPPAGA audits many state agencies including FDOT for performance and policy compliance. The OPPAGA has produced numerous reports on the asset management program at FDOT, which includes the Asset Maintenance contracts for performance-based highway maintenance.

The first performance-based maintenance contract with ICA in 2000 had similar beginnings resembling VDOT’s pilot with VMS in 1997. The 2000 pilot at FDOT was sparked by an unsolicited proposal that mimics how VDOT began their asset management pilot. Prior to the FDOT pilot project, the agency had been experimenting with large scope asset management contracts. Between 1996 and 1999 Roy Jorgenson Associates had a total asset management contract (performance specifications included) for approximately 35 miles of interstate four (I-4). During the three-year contract, service levels improved greatly from 51 to 87 and costs remained steady (Segal et al. 2003).
<table>
<thead>
<tr>
<th>Year</th>
<th>FDOT Procurement &amp; Contracting Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>Florida legislature authorizes $50 million dollar Design-Build pilot program (FDOT 2004).</td>
</tr>
<tr>
<td>1991</td>
<td>FDOT received only two proposals between 1991 &amp; 2000 to construct private transportation facilities since this option was authorized by the Legislature in 1991 (Roth 2000).</td>
</tr>
<tr>
<td>1994</td>
<td>In late 1994, District Two awarded a pilot contract on Interstate 95 that consolidated 136 different maintenance areas into a single contract (Segal et al. 2003).</td>
</tr>
<tr>
<td>1995</td>
<td>Florida Legislature authorizes the FDOT to use the Design-Build process for buildings, major bridges, and rail corridor projects (FDOT 2004).</td>
</tr>
<tr>
<td>1996</td>
<td>Florida Legislature expands design-build authority to include all project types as a part of the &quot;innovative&quot; practices package (FDOT 2004).</td>
</tr>
<tr>
<td>1996 and 1999</td>
<td>Roy Jorgenson Associates had a total asset management contract for roughly 35 miles of Interstate 4 between Orlando and Lakeland, Florida, (Segal et al. 2003).</td>
</tr>
<tr>
<td>1999</td>
<td>Unsolicited proposal given to FDOT for outsourcing highway maintenance, proposal details a possible 10% cost savings.</td>
</tr>
<tr>
<td>2000</td>
<td>Maintenance Division launches first Performance-Based Maintenance contract for portions of Interstate 75.</td>
</tr>
<tr>
<td>Early 2004</td>
<td>$484 Million in 17 executed contracts, $64 Million annually. (Lattner 2011)</td>
</tr>
<tr>
<td>Early 2006</td>
<td>$700 Million in 23 executed contracts, $95 Million annually. (Lattner 2011)</td>
</tr>
<tr>
<td>Beginning 2008</td>
<td>$760 Million in 28 executed contracts, $107 Million annually. (Lattner 2011)</td>
</tr>
<tr>
<td>End-2008</td>
<td>$900 Million in 30 contracts by end, $118 Million annually. (Note: Estimates given in Tim Lattner presentation at AMOTIA conference. (Lattner 2011)</td>
</tr>
<tr>
<td>2009 - 2012</td>
<td>30+ AM Contracts totaling $129 Million annually. (Lattner 2011)</td>
</tr>
</tbody>
</table>
Place holder for FDOT Timeline (NOT a Comparison)

Figure 26 – FDOT Timeline
Figure 24 – FDOT Timeline

Timeline Legend:
- Country or State Procurement Law
- Maintenance Milestone
- Country or State PBMC Program
- Country or State Evolutionary Milestone

Country or State Procurement Law
- 1987: Florida Legislation passes $50 million Design-Build Pilot Program launched

Country or State Evolutionary Milestone
- 1992: State of Florida commissions a DB study by University of Florida (UF) comparing the DB process with D-D-B

Country or State PBMC Program
- 1980 - 1985: Contract Program Span

Maintenance Milestone
- 1980
- 1981
- 1982
- 1983
- 1984
- 1985
- 1986
- 1987
- 1988
- 1989
- 1990
- 1991
- 1992
- 1993
- 1994
- 1995
- 1996
- 1997
- 1998
- 1999
- 2000
- 2001
- 2002
- 2003
- 2004
- 2005
- 2006
- 2007
- 2008
- 2009
- 2010
- 2011
- 2012

- 1995: Design-Build opportunities expanded “innovative projects”
- 1996: Design-Build opportunities expanded

1980
- 1980 Highway Maintenance Milestone

1981
- 1981 Report/Study

1987
- 1987 Florida Legislation passes $50 million Design-Build Pilot Program launched

1992
- 1992 State of Florida commissions a DB study by University of Florida (UF) comparing the DB process with D-D-B

1995
- 1995 Design-Build opportunities expanded

1996
- 1996 Design-Build opportunities expanded “innovative projects”

1995
- 1995 Design-Build opportunities expanded

2000 - 2007
- 2000 - 2007 1st Performance-Based Maintenance Contract w/ ICA

2001
- 2001 1st AM County-wide w/ Interstates & Primary roads BD049 – District 3
- 2001 1st AM Facilities (Rest Areas, Weigh Stations, Wayside Parks) BD332 – District 1

2002
- 2002 1st AM for Secondary Roads (SR) BD355 – District 4

2000
- 2000 1st PBMC Contract FDOT w/ ICA

2002
- 2002 1st AM District-wide Bridge Contract BD330 – District 7

2002
- 2002 Governor’s Office of Policy and Budget

2003
- 2003 Instructs agencies to reduce staff by 25% over 5 years

2000
- 2000 Governor’s Office of Policy and Budget

Instructs agencies to reduce staff by 25% over 5 years

2001
- 2001 Florida Legislation passes $50 million Design-Build Pilot Program launched

2001
- 2001 Design-Build opportunities expanded

2001
- 2001 Asset Maintenance (AM) contracts Performance-Based excludes resurfacing

Florida Department of Transportation
Main Roads of Western Australia
(MRWA)
6 Australia – Main Roads of Western Australia (MRWA)

6.1 Maintenance Program Background

Main Roads is the agency in charge of transportation services across Western Australia. Main Roads of Western Australia (MRWA) has a maintenance program with performance-based contracting as the primary avenue for outsourcing. Main Roads has been using performance-based contracts since 2000. The usage of performance-based contracts for highway maintenance has allowed Main Roads to equally share and transfer risk between agency and service provider. MRWA’s maintenance contracts outsource almost all activities as opposed to places such as Victoria, Australia, which only contracts routine maintenance with performance-based contracts. Other parts of Australia have been involved with performance-based methods; however, Main Roads history and 100% outsourcing agenda services as the best Australian territory for studying and comparing to VDOT.

Currently the Western Australia highway maintenance program is undergoing a contracting transition that will change the way services are managed and delivered. The current transitional process is underway in 2011 and will be completed according to Main Roads in 2012. This research project focused mainly on the new maintenance system that will begin in 2012; however, the older system will be reviewed in this chapter and in later chapters for VDOT timeline and evolution comparisons.

The older maintenance program at Main Roads (in its final stages) used corridor only or fence-to-fence style contracts for maintaining the highways. These corridor style contracts are both similar and different compared to those used by US DOT’s. The major difference in Western Australia contracts as compared to US DOT’s is Main Roads allowing contractors to deliver capital works.

The older corridor only style contracting system at Main Roads started between 1998 and 2000. Between these years, Main Roads publicly let 8 “Term Network Contracts”. The Term Network Contract system divided the road network into 8 networks, each with its own contractor. The TNC’s cover approximately 17,800 km (~11,060 miles) of highways, freeways and main roads throughout Western Australia’s vast landscape. Each of the eight TNC’s were 10 year duration contracts with a combined value of over $1 billion (Barnsley, 2008). Figure 27 shows the TNC network in Western Australia.

Along with the TNC’s there is an additional ninth contract called the Traffic Control Infrastructure Contract (TCIC). The TCIC contract encompasses the maintenance of all electrical and ITS assets in Western Australia. The following assets are included in the TCIC contract: traffic control signals, Main Roads lighting, emergency telephones, CCTV monitoring cameras, variable message signs and other electrical supporting systems. The TCIC contract is a 10 year, $75 million lump sum package that also includes delivery of traffic control related construction projects.

During the execution stage of the TNC contracts, Main Roads decided to conduct an internal review of the past 6-8 years since the start of the contracts. The internal review was meant to identify areas working well within the contracts as well as areas for improvement. The TNC review process was used to shape the future of asset maintenance in Western Australia after the contracts were set expire between 2009 and 2011. Feedback from the public as well as private contractors added value to the reports that were published between 2007 and 2008. The follow were some major lessons learned from the internal review process (Barnsley 2008):

- Main Roads must have involvement, influence and control of asset management;
- Good relationships are critical to achieve best outcomes;
- Must have flexibility to respond to change;

Upon completion of the internal review, Main Roads went to work on formulating the framework for new a set of maintenance agreements. First, the agency began researching various current industry delivery methods for ideas (Barnsley 2008). Current industry methods identified were:

- Direct Management Approach
- Term Maintenance/Network style contracts
- Relationship Contracting (i.e., Alliancing and Partnering)
- Separate Business Unit

Each of the methods above was analyzed using a SWOT analysis to highlight potential risks (Henneveld and Noble, 2008). Main Roads officials decided to go with a “Relationship” based contracting approach while holding onto the successful practices used in the Term Network Contracts. TNC best practices such as using Key Performance Indicators (KPI’s) for monitoring and motivating the contractor were kept. The use of KPI’s provided both incentives and disincentives in the contract depending on performance. The use of incentives within maintenance contracting was an area of interest for VDOT staff and will be covered in subsequent sections of this chapter.

The new delivery system developed by Main Roads is called the Integrated Services Arrangements also known as the ISA’s. The agency notes in there online publications that these new agreements are not just another Term Network Contract or “run of the mill” maintenance contract. The new ISA’s will integrate the following service areas (more on scope in section 3.4.2):

- Integrated Operational Asset Management
- Maintenance Services Delivery
- Network Operations
- Project and Contract Management
- Capital Works Delivery

Between October and December of 2010, Main Roads was creating the formal ISA contracts for implementation beginning in 2011 and 2012. The ISA system (area-wide maintenance contracts) resembles the MAC method from England (area-wide) which will be discussed in later sections. The resemblance between the agencies and their respective delivery systems can be noticed in many ways; both physical and philosophical. The first and most obvious similarity to England is the use of territorial contracting styles as opposed to a corridor style only contract. The new ISA’s will be based on regional maintenance boundaries. This includes highway corridor maintenance like the original Term Network Contracts in addition to asset maintenance on local government roads (signs and structures). Secondly, the use of contracting philosophies such as Alliancing and Key Performance Indicators is used in the ISA (Western Australia) and MAC (England) contracts. These important contracting principals help expand the agency’s ability to work with local governments, monitor scope of services and enable stronger focus on teamwork and value for money.

Figure 27 and Figure 28 have been included to visually illustrate the transition from Term Network Contract to Integrated Services Arrangement. Notice the new territorial boundaries associated with the new ISA’s in Figure 28.
The eight original TNC contracts (Figure 27) plus TCIC contract will transform into seven new ISA contracts (Figure 28). Each of the seven areas will be lettered (A-G) and will have its own respective service provider (ISP – Integrated Service Provider). Figure 28 shows what the Main Roads hopes to achieve by 2012 when the contracts have been fully transitioned and implemented. The ISP will be responsible for their own area marked by territorial boundaries. The various territorial boundaries are based upon historical regional boundaries and have been kept for simplicity according to Main Roads (Barnsley 2008).
To maintain a smooth transition into the new set of contracts by 2012, the agency has implemented a 5-phase process. Currently, Main Roads is in the 4th phase of the transitional process; “Implement the Arrangements”. Phase four involves developing the tender documentation, completing the tendering process and awarding the contracts. Table 29 displays the 5-phase procurement process put together by Main Roads personnel in charge of the new ISA’s.

Figure 28 – MRWA: Integrated Service Arrangement System (2011 – Future) (Barnsley 2008)
Used with permission by Robert Barnsley
6.2 Area #1: Scope of Services

This section will describe the scope required by Main Roads for the Term Network Contracts as well as the new Integrated Services Arrangements. There are both similarities and differences between the two agreements. The new ISA’s strive to build upon the best practices of the TNC contracts while adding additional strategies from other highway agencies.

6.2.1 Term Network Contracts (TNCs)

The Term Network Contracts encompassed many work areas including rehabilitation services. The TNCs were lump-sum contracts with 10-year fixed durations. These contracts were a step towards the agency’s overall objective of becoming a “network manager”. Here is the scope of services in a typical Term Network Contract in Western Australia (Henneveld and Noble 2008):

- Inspection and monitoring of asset condition
- Asset management (with respect to maintenance)
- Asset inventory data maintenance
- Customer service
- Emergency response and special events

Table 29 - MRWA: ISA Transition Process (Barnsley 2008)
Used with permission by Robert Barnsley
Routine maintenance
Periodic maintenance
Resurfacing and rehabilitation
Some minor capital works

The minor capital works responsibility shifts a significant amount of risk to the contractor but also requires significant amounts of design and document preparation by Main Roads (Henneveld and Noble 2008). Under the minor capital works provision, the contractor may provide a proposal that illustrates value-for-money in addition to totaling less than $1.5 million. If the proposal is more than $1.5 million, Main Roads has the authority to open the proposal to public tendering (Henneveld and Noble 2008). Capital works that have been completed under the TNC style contract range in size. Works can be anywhere from several hundred dollars for signs and pavement markings to the maximum ($1.5 mil) for road widening initiatives.

The Term Network Contract also includes the use of a collaborative working group between the contractor and Main Roads staff. The “Term Contract Working Group” is a board of both company and Main Roads personnel involved with the Term Network Contracts (Henneveld and Noble 2008). The board’s purpose is to consider and make recommendations on improvements to the administration and operations of the contracts. The working group acts as an overseer for all of the term contracts; there is only one group reigning over all nine contracts; as opposed to having one group per contract.

6.2.2 Integrated Services Arrangements (ISA’s) (2012 – Future)

The new Integrated Services Arrangements mark the beginning of a new era in the way Main Roads conducts for highway maintenance services. The new arrangements aim to provide a better risk allocation scheme than the original Term Network Contracts.

The intent of the ISA contracts is collaboration between the Integrated Services Provider (ISP) and Main Roads staff. Collaboration is envisioned as working together as one unit and having aligned objectives to attain the desired program/project outcomes. To promote communication for better service, Main Roads will be forming ISA Management Teams, each responsible for operations in their respective regional contract. The ISA team will comprise both Main Roads and ISP staff. Main Roads hopes to remove the division between parties by forming these teams and stationing team members together throughout the regional offices. Utilizing the ISA team strategy integrates the project personnel for collaborative decision-making. The team philosophy serves as another risk-balancing tool, which was non-existent during the Term Network Contracts.

Main Roads will be enacting a rule with the new contracts which states that no ISP can be awarded adjacent Integrated Service Arrangement areas. This provision serves to prevent the ISP from treating adjacent maintenance areas as one larger network, potentially compromising maintenance quality in each area.

ISA agreements will be using a reimbursement of direct costs plus margin (cost-plus) contract payment scheme versus the original lump sum/fixed payments used by Term Network Contracts. The “plus” portion of the ISA arrangement will be the contractor’s overhead and profit. To incentivize the contractors towards good performance, a portion of their profit will be subject to a risk/reward program. The program will be based on agreed Key Result Areas (KRA’s) that are deemed critical to meeting Main Roads and ISA program business objectives and desired outcomes. The KRA’s risk/reward program will be discussed later. The use of an “open book” approach will be used in pricing and payment to ISPs in order to maintain transparency during the agreements (Barnsley 2008).

Main Roads seeks to have a flexible term structure with the new ISA’s. The term for the new contracts is not a fixed duration like the old TNCs. The new contracts have a five-year minimum duration with the potential for a one-year extension after the fifth year provided performance minimums are achieved. Additional one-year extensions will be available until either party opts out of the agreement. This renewal scheme (5+1+1+1….) promotes long-term relationships with the private sector and serves as method for achieving another one of Main Roads objectives; promotion of long-term relationships. The hope is for ISA contract durations to last between 25 and 30 years provided strong relationships are built and performance is sufficient (Barnsley 2008). The ISA framework for term
and renewals is quite different from the usual fixed term contracts with maximum extensions. The contractor could potentially have the contract for numerous years provided performance is met. The contractor is exposed to termination only if performance evaluations show up negative three years in a row. Please see Exhibit E.1 for term guidelines. There is also example term schemes to illustrate the term structure.

For the duration of the ISA agreement, the scope of services will include (Barnsley 2008):

- **Road network operation**
  - Provide safe and efficient access to the network
  - Managing incidents
  - Regulatory matters (e.g. road signage) and identifying
  - Identifying deficiencies for the planning of capital works (including safety improvement projects)
  - Network Monitoring and Traffic Management – including safety audits and crash investigations
    - Reporting on network performance: investigation of network capacity including level of service, travel time, delays etc.
  - Customer Service: stakeholder and community engagement; traveler and incident information reporting
- **Operational Asset Management**
  - Development and implementation of processes and tools to improve road user and stakeholder satisfaction. (Barnsley, 2010)
    - Identifying needs via pavement modeling, gap analysis/assessment, traffic and crash data analysis, analysis of network condition and performance data
    - Developing programs and projects to meet the identified needs through project concept development, planning estimates, benefit-cost ratios and business case preparation
    - Optimizing and integrating works programs and projects
    - Reviewing and optimizing delivery programs (including maintenance)
    - Reviewing network performance
  - Asset data maintenance: manage the update of the state’s asset inventory.
- **Maintenance delivery**
  - Routine and periodic maintenance activities
    - Bridge Maintenance
    - Minor pavement marking repairs when needed (see excluded works below)
  - Network & Asset Inspection (Self Assessments checked by 3rd party)
  - Works will include capital improvements (i.e. resurfacing, rehabilitation, reconstruction)
  - Plant management
  - Main Roads will assist ISP with these specific areas under delivery: structures and project, contract, work management and technical roles
- **Capital works delivery**
  - Minor capital works delivery up to $3 million (TNC’s were $1.5 million)
- **Project and contract management services (optional)**

The scope of services specifically will not include (Barnsley 2010):

- **Pavement Markings on state and local government roads.** This work will be conducted under separate “Common Use Contract” (MRWA version of traditional method-based contracting). ISA will be responsible for planning and scheduling the pavement marking work.
- **Specialist Asset Management Services:** i.e., - pavement modeling and condition data analysis. This management service used to be included under TNCs.
- **All Engineering, Design and Technical Services** within the contract area will be shared by ISP and other outsourced contractors. Under the ISA agreement, the ISP will have to provide these services for
capital works improvements (i.e. Rehabilitation); however, current bridge design services and public tendering will done by Main Roads. Main Roads will still be participating in these services to maintain a level of control. Details are located in the Pilbara RFP.

- Investigating unauthorized works on the Main Roads road network.
- Surveillance/audit works undertaken by others to ensure compliance with Main Roads standards and specifications.

The ISA includes an optional provision for “Project and Contract Management Services” serves as means to acquire additional consulting services through the ISP (contractor) in regions with higher work demands. Main Roads will choose to add this provision as they see fit. This provision was added to the ISA to enable contractors to form joint ventures with design and consulting firms, which allowed contractors to handle larger workloads. The ISA contract provisions also require supervisory services from the regional ISP. The supervisory provisions enable a self-certification process to take place on the network. Main Roads is therefore able to maintain a network manager role instead of inspector role.

In addition to the services listed above there will be other unique responsibilities throughout each ISA regional area. Each area has its own specific requirements and will therefore be adjusted to accommodate specific maintenance needs. The list below is a compilation of assets that will be accounted for over the seven different regional contracts (Barnsley 2008).

- All on-road and off-road assets within Main Road’s reserve (i.e., “fence-to-fence” including structures)
- All bridges on other public roads (as per Main Roads responsibilities)
- Regulatory signs and road markings on regional LG roads
- Nearly all traffic signs and road markings on metropolitan LG road
- Dual Use Paths (Principal Shared Paths) that are Main Roads’ responsibility
- The Graham Farmer Freeway (GFF) Tunnel, and
- Electrical and Intelligent Transport System (ITS) assets

The second bullet from the top, “All bridges…” should be interrupted as Mains Roads has a “statutory responsibility” for the regulatory signing of bridges on all public roads. Mains Roads also assists local governments and bridge owners with managing their bridges on unclassified roads (Barnsley 2008).

The original state-wide TCIC contract will be combined into the Metropolitan ISA agreement. The Metropolitan ISA (Area G) contractor will have to be more diverse in its capabilities due to the added task of maintaining all electrical and ITS assets in Western Australia. The reason this contract merged into Area G was due to the abundance of ITS assets in the city of Perth as compared to the rest of Western Australia. Letting separate contracts would be time consuming and more expensive for Main Roads.

The Main Roads staff decided to continue using the oversight work group from the Term Network Contracts. The “Term Contract Working Group” as it was known under the TNCs will be known as the “ISA Governance Team”. The ISA Governance Team will be comprised of both ISP and Main Roads personnel. Main Roads will be using the Governance Team as means to promote accountability for ISP management and maintenance delivery. The team will be in charge of the following duties (Barnsley 2008):

- Review strategic direction (e.g. changes to the scope of the arrangement)
- Review and approval of performance targets and goals
- Review of Performance Evaluation Group (PEG) evaluations
- Review of the processes used in the development of the Annual Work Program (AWP)
- Recommending the ISP incentive payments to the Commissioner (equivalent to Commonwealth Transportation Board and VDOT)
- Proposing ISA amendments to the Commissioner and ISP parent company
• Recommending term extensions to the Commissioner and the ISPs parent company based on positive performance.

The use of a team/board represents how the Alliancing/Partnering philosophy was incorporated into the arrangements. The governance team will help promote communication, dispute resolution and improvements over all the ISA arrangements. Figure 29 displays the intended structure between the Governance Team and ISA Management Team. The purpose of this structure is to ensure decision-making, accountability and control is maintained during the contract period.

As previously mentioned, integration is very important with the ISA arrangements. To maintain integration with the Integrated Service Provide, Main Roads will be requiring the use of agency established systems, processes and guidelines during the contract. This will allow Main Roads to consolidate information and promote consistency across all ISA contracts. Here are some of the integrated systems and procedural areas, which Main Roads will require the ISP to participate in while delivering services (Barnsley 2008).

• ISP to use Main Roads established quality management framework (including systems) (e.g., quality (QMS), occupational safety and health (OSH) and environment)
• Information and communication technology (ICT) – ISP must use a Microsoft system based architecture.
  o Standard Operating Environment (SOE) – Main Roads will supply all PC’s and related equipment to ISP under ISA arrangement. Software will be included.
• Operational asset management (including maintenance management information systems (MMIS)/tools). Main Roads is currently developing procedures and guidelines to assist ISP’s with operations activities. Development areas include:
  o Defining minimum core processes, practices and guidelines for use in the planning and delivery of road asset maintenance
    • Specific asset maintenance development areas include: condition assessment and inspections, asset life-cycle management analysis to support optimal asset management decision-making, risk assessment and management and innovation.
  o Defining minimum corporate data requirements for routine and periodic road asset maintenance
  o Establishing the optimum method for compiling and storing corporate data relating to State-wide road asset maintenance for adoption by each of the ISAs (e.g., frequency of data provision/updates and format)
  o Establishing corporate standards for maintenance data (e.g., asset defects, asset condition rating, work treatments etc.) for adoption by each of the ISAs.
• Financial Management Systems.
Figure 29 – MRWA: ISA Governance & Management Structure (Barnsley 2008)
Used with permission by Robert Barnsley
6.2.2.1 MRWA: Integrated Services Arrangements (ISA’s) (Pilbara Region)

While researching Western Australia, Robert Barnsley, ISA Project Director, was contacted with questions on the new ISA contracts. Mr. Barnsley was able to provide an actual “Request for Proposals” for the Pilbara Region contract. The Pilbara Region dubbed “Network B” can be seen in Table 30. The scope of services for each of the ISA’s is broken up into the categories of services requiring road network operations, operational asset management, project and contract management, maintenance delivery, and business management. Table 31 shows a portion of the scope of services in Pilbara. The category for “Road Network Operations” covers areas such as incident management and customer service. Notice the right specifically states which party is involved, whether Main Roads, ISP or both.

Table 30 - MRWA: Pilbara Region (Barnsley 2010)
Used with permission by Robert Barnsley

<table>
<thead>
<tr>
<th>Area</th>
<th>497 000 km² (approx.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>40 000</td>
</tr>
<tr>
<td>Major Towns</td>
<td>Port Hedland, Karratha, Tom Price, Newman, Paraburdo</td>
</tr>
<tr>
<td>Network Information</td>
<td>Key Mining and Pastoral Region Network major uses:</td>
</tr>
<tr>
<td></td>
<td>• Transport Commodities</td>
</tr>
<tr>
<td></td>
<td>• Tourism</td>
</tr>
<tr>
<td></td>
<td>• Local regional traffic</td>
</tr>
<tr>
<td></td>
<td>• 382km unsealed road</td>
</tr>
<tr>
<td></td>
<td>• 7 461km of LG roads</td>
</tr>
<tr>
<td>Road Length (MR Network)</td>
<td>2 276 km</td>
</tr>
<tr>
<td>Structures -Total</td>
<td>113</td>
</tr>
<tr>
<td>Non –Timber Bridges (MR Network)</td>
<td>81</td>
</tr>
<tr>
<td>Major Culverts (MR Network)</td>
<td>9</td>
</tr>
<tr>
<td>Non-Timber Bridges (LG Network)</td>
<td>23</td>
</tr>
</tbody>
</table>
For other areas of the customized scope please see Exhibit E.2 of Appendix E. Exhibit E.2 is known as the “Functional Description Tables” or FDTs from the ISA – Pilbara Region RFP. The FDT’s help the proposer understand their roles in delivering maintenance and how integration with Main Roads will function. It outlines the duties of the ISA, Main Roads and any works undertaken by both parties (collaboratively). The table can be considered a roles and responsibilities matrix for management purposes.

6.3 Area #2 – Contract Performance Monitoring

6.3.1 Term Network Contracts: Measurement & Assessment

The six performance-based TNC contracts measure performance with Road Maintenance Intervention Parameters (RIMPs) and Asset Condition Profiles (ACPs). The RIMPs describe the allowable condition for 65 various possible defects on the roadway. These defects are categorized under six road component areas (e.g., Traffic Devices & Vegetation) and apply to five road categories (e.g., Freeways and rural roads). The allowable conditions have a range of requirements based upon the severity, the rate of deterioration and the defect. The RIMPs use these three thresholds:

- “Maximum Interventional Level” – severity level of single defect that will require remedial action.
- “Maximum Response Time” – time allotted to complete remedial action.
- “Maximum Defect Condition” – max number of defects allowed which are in need of remedial action. This number varies by defect type within each of the 5 road categories.

Note: The RIMPs are the equivalent of US DOT timeliness requirements.
Asset Condition Profiles (ACPs) include work such as pavement modeling and reporting to Main Roads. The new ISA contracts do not require these profiles due to the amount of variability in modeling frameworks among contractors.

6.3.2 Term Network Contract: Payment & Performance

The TNC’s fixed monthly payments based on the lump sum contract were subject to adjustment based on performance. There would be annual adjustments, increases and decreases based upon the Key Performance Indicator outcomes.

6.3.3 Integrated Services Arrangements: Measurement & Assessment

The performance framework for the ISA’s is based off the Australia Business Excellence Framework (ABEF). According to the Pilbara RFP principles from the framework are used in the ISA to promote integrated leadership and management for long-term sustainability. The framework principles are important for two reasons; monitoring performance but also improving performance.

The framework will involve the Governance Team, Management Team and a “Performance Evaluation Group” (PEG) (third party). The PEG will be made up of only outside consultants or Main Roads staff not involved in the ISA management or governance teams (Barnsley 2008). The ISA Management Team will be self-assessing their performance in their area. The third party (PEG) will audit the self-assessments conducted and then send its review and recommendations to the ISA Governance Team. Recommendations on ISA Management team’s process and any changes that should be made to performance indicators. PEG reviews would also recommend changes within the incentives program. Changes could be either to increase or decrease the given percentage used to total the contractors pay adjustment.
The assessment of services will begin three years into the contract and continue on a yearly basis. Arrangements can be terminated if the provider has two negative performance assessments within a three-year consecutive timeframe. Main roads plans on having a strategic review at five year intervals with Area teams to discuss strategic directions and change arrangements if need be. Table 32 details the roles of the PEG versus the roles of the ISA team that self-inspects the ISA region.

Table 32 – MRWA: ISA Performance Role/Duties (Barnsley 2008)

Used with permission by Robert Barnsley

6.3.4 Integrated Services Arrangements: ISP Self-Inspections & Standards

As mentioned in the previous section the ISP is required to self-inspect the maintenance services it delivers for Main Roads. Main Roads will require service “depots” to be located across the network so that inspectors and
routine maintenance crews can attend to incidents and emergencies within target response times. Below are some various response times based on roadway type (Barnsley 2010):

- One hour for roads in urban areas;
- Two hours for roads in rural areas; and
- Four hours for roads in remote areas.

The definitions on what classifies rural and remote areas are determined between ISP and Main Roads after award.

The use of intervention parameters (RIMPs) will be used on the ISA projects for determining level of service on the network (adopted from TNCs). These parameters ensure that the network is in a serviceable and safe state on a daily basis. The parameters are for a wide-range of assets and follow a priority Table 33 is a snapshot of RIMPs for “Sealed Roadway”. Exhibit E.3 in Appendix E displays all the RIMPs that will used in the Pilbara Region - ISA. The RIMP’s have been adopted from the original TNC contract located in Pilbara.

Table 33 - MRWA: RIMPs Example from Pilbara-ISA Contract (Bransley 2010)

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SEALED ROADWAY -including shoulders</td>
<td>M</td>
<td>1.1.1</td>
<td>90 counts/km</td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>1.1.2</td>
<td>100 counts/km</td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>1.1.3</td>
<td>110 counts/km</td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>1.1.4</td>
<td>140 counts/km</td>
<td>6 months</td>
</tr>
</tbody>
</table>

| 1.1  | Roughness | Scheduled by Superintendent | M | 1.2.1. | 90 counts/km | 3 months | 100m in 10km |
|      |           |                             | A | 1.2.2. | 20 mm depth | 6 months | 200m in 10km |
|      |           |                             | B | 1.2.3. | 20 mm depth | 6 months | 200m in 10km |
|      |           |                             | C | 1.2.4. | 30 mm depth | 6 months | 200m in 10km |

| 1.2  | Rutting | Scheduled by Superintendent | Any | 1.2.1. | 90 counts/km | 3 months | 100m in 10km |
|      |         |                             | M | 1.2.2. | 20 mm depth | 6 months | 200m in 10km |
|      |         |                             | A | 1.2.3. | 20 mm depth | 6 months | 200m in 10km |
|      |         |                             | B | 1.2.4. | 30 mm depth | 6 months | 200m in 10km |
|      |         |                             | C | 1.2.5. | 30 mm depth | 6 months | 200m in 10km |

### 6.3.5 Integrated Services Arrangements: Payment & Performance

Payments will begin adjustment based on the performance evaluations starting in year three. The direct costs are reimbursed and the margin will be subject to the percentage increase or decrease. Payments to ISP’s under the ISA will take place in the following manners using an open-book approach (Barnsley 2010):

- Reimbursement of the direct costs incurred by the ISP in providing services;
- Payment of a margin comprising corporate overhead and profit; and
- Payment of a fee modifier amount under a fee modifier regime by Main Roads to the ISP for outstanding performance in the key result areas under the ISA Agreement or payment of a fee modifier amount by the ISP to Main Roads for less than desirable performance in the key result areas (i.e. a
percentage of the ISP’s margin will be available to reward or be at risk for performance in the key result areas).

It is important to note that funding is based on a flexible stream. ISP must provide services based on the yearly funding amounts therefore forcing the contractor to prioritize and innovate service strategies.

The fee modifier, which either rewards or penalizes the provider, will be driven by Key Results Areas (KRA’s) and under each area will be various Key Performance Indicators (KPI’s). The KRA’s and KPI’s will be proposed by Proponents and subsequently finalized by Main Roads during the interim ISA phase.

6.4 Area #3 – Performance-Based Contracting Results

6.4.1 Term Network Contracts (TNC’s)

What worked well?
The use of the “Term Contract Working Group” has reportedly been very valuable to communications between parties. Communication efficiency within the working group has enabled faster resolutions compared to resolving issues on a contract-by-contract basis. Important changes in areas such as environmental legislation and new standards for Traffic management have all been handled with the working group. Members of the group are able to provide “mutually agreeable approaches” to the dynamic contracting environment that is encounter from year to year.

What didn’t work well?
Under the Term Network Contracts, the contractor was responsible for specialist asset management services such as pavement modeling and condition data analysis. Since each TNC contractor was in charge of this the modeling became inconsistent. Each contractor had their own set of inputs and outputs and therefore a common ground was never met for operational asset management across the entire state network. To remove this variability, Main Roads will let a separate contract for specialist services. This will allow one consultant to model data for the entire state network.

6.4.2 Integrated Services Arrangements

There is no data available yet on the new ISA contracts since they have only recently begun implementation. Interested parties must wait until year three of each contracts operation for evaluations to begin (2015). Main Roads hopes to see a cost savings with the new contracts by utilizing the “Cost-Plus” funding scheme compared to lump sum. This scheme will force ISA teams to deal with fluctuations in maintenance funding on a yearly basis.

6.5 Australia Timeline

Historically the Main Roads agency carried out all maintenance works with the exception of specialist works subcontracted out to private sector. Main Roads has shifted their organizational objectives over the past 30 years by downsizing the amount of retained staff. Staff levels at Main Roads peaked around 3000 employees during the 1980’s. Since then the agency has been slowly shrinking in the number of retained staff because of increased outsourcing initiatives. Outsourcing of works has increased since the 1960’s where around 17% of contracts were competitive tendered to the private sector. In 2000, a major milestone was achieved for Main Roads by outsourcing at 100%. Prior to full outsourcing in 2000, Main Roads began their outsourced road maintenance program in 1996 with the release of seven TMC contracts. These contracts were method-based contracts based on work order direction. The agency was represented by the “Superintendent” whom identified defects and issued the work orders for contractor. According to a source provided by Robert Barnsley, the TMC’s although costly in overhead due to method-based format, did accomplish three important results (Bransley 2012):

- Assisted with the development of industry;
- Produced a better data base; and
- Assisted the development of acceptance within Main Roads of the delivery of road maintenance by contract.

The second generation of outsourcing for asset management came in 2000 with the Term Network Contracts and associated professional services contracts (TCIC, TACs and Design Contracts). The Term Network contracts were the first round of performance-based maintenance contracts issued by Main Roads. Eight TNC contracts were released, six were fully outcome based and two were hybrid. The hybrid contracts resembled the method-based work directed contracts from the TMC era (1996 – 1999). Hybrids included both method and performance-based specifications. The TNC’s were coupled with the TCIC, a statewide electrical and ITS asset contract. The other contracts involve a first priority bidding and pricing opportunity for a service provider. Main roads contracts are awarded to service providers who are on call for a three-year term. During the contract term, Main Roads project managers prepare work packages of desire works and submit to contractor. If the contractor can bid the work and show value for money (i.e. Best Value) then the work is award to the contractor. If the bidding shows poor value then the work package is opened up to competitive tendering. This procurement model is used for TACs and Technical Engineering Service Contracts (bridge and other design services).

Table 34 – Main Roads of Western Australia Timeline (Barnsley 2012)

<table>
<thead>
<tr>
<th>Year</th>
<th>Main Roads – Procurement &amp; Contracting Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960’s</td>
<td>17% of maintenance works outsourced.</td>
</tr>
<tr>
<td>1980’s</td>
<td>80% of maintenance works outsourced.</td>
</tr>
</tbody>
</table>
| 1996 | **Term Maintenance Contracts (TMCs)**  
- Seven total contracts covering 30% of Western Australia highways and main roads.  
- 3 year contract term.  
- Contracts were paid on schedule of rates – work order direction.  
- Contracts were paired – 3 pairs of two contracts. Each pair had a common superintendent. |
| 1999 | **Term Network Contracts (TNCs)**  
- 8 TNC’s - 6 performance-based & 2 hybrid (mixed format).  
- 10 year contract term.  
- Maximum of two contracts per contractor, max of 1 metropolitan contract each.  
- ~17,000 km covered by TNC’s  
**Traffic Control Infrastructure Contract (TCIC)**  
- Single state-wide contract for delivering maintenance, rehabilitation and capital works services on traffic control infrastructure.  
- Electrical assets such emergency telephones and lighting was included in the contract.  
- 2 payment mechanisms  
  - Lump sum for maintenance and rehabilitation works; and  
  - Agreed pricing structure for capital works (i.e. target cost). |
<p>| 2000 | Main Roads becomes 100% Outsourced with the release of TNC’s. |
| 2012 | <strong>Integrated Services Arrangements (ISAs)</strong> |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
|   | Move from a corridor to area wide maintenance approach.  
|   | Alliancing structure with Key Performance Indicators  
|   | Move from lump sum to cost-plus payment structure |
Figure 30 - Western Australia Timeline
Figure 30 - Western Australia Timeline

Main Roads of Western Australia (MRWA)

Timeline Legend:
- Country or State Procurement Law
- Country or State PBMC Program
- Country or State Evolutionary Milestone
- Maintenance Milestone

Timeline:
- 1999 - 2011: 1st Performance-Based Maintenance Contract
  - 10 year
- 1999: 1st PBMC - Western Australia
- 2000: TNC’s Contracts help Australia reach 100% Maintenance Outsourcing
- 2001: Term Asset Contracts Structures (TACs)
- 2000: Technical Engineering Services Contracts (TCC & TCCS)
- 1999 - 2011: Integrated Services Arrangements (ISA)
- 1999 - 2012: Term Network Contracts
  - Corridor-style & Lump-sum
- 2011 - 2012: Cost-plus contracts
England’s Highways Agency
7  England – Highways Agency (HA)

7.1  Maintenance Program Background

The Department for Transport in England has an executive agency known as the Highway’s Agency. The Highway’s Agency is the equivalent of the Federal Highway Administration here in America. The Highways Agency is in charge of managing the highway system throughout England. The agency strives to provide three main outcomes for the public: Safe Roads, Reliable Journeys and Informed Travelers. To obtain these desired goals, the Highways Agency has put together an innovative contracting system for asset maintenance. The system values close collaboration with contractors, detailed performance monitoring and a value-for-money outlook when maintaining the road networks. The maintenance system uses an “area-wide” style performance-based contract for managing the roads as compared to a “corridor” style system. The county is divided up into fourteen separate area-wide contracts, each with its own Area Team and engineering consultant (Managing Agent Contractor). Halcrow Group currently serves as one of the many managing agent contractors acquired by the Highway’s Agency (HA). Apart from the 14 areas, there are other separate maintenance contracts in the form of a Design-Build Finance-Operate (DBFO) delivery method. These contracts have their own “managing agent” who is responsible for the road maintenance on that specific corridor project. For example, A-one+ (a joint venture between Halcrow Group Ltd, Colas Ltd and Costain Group plc.) is the Managing Agent Contractor for Area 12. Within Area 12 lies the M1-A1 Link which one of nine DBFO projects in England that is currently underway. Balfour Beatty Major Civil Engineering assumes the responsibilities for maintenance on the M1-A1 Link. A-one+, although in charge of Area 12, does not work on the maintenance of the M1-A1 Link; only Balfour Beatty works on this section of the network (AECOM 2007). Figure 31 shows a map of how the Managing Area Contractor contracts are laid out.

![Figure 31 – HA: 14 MAC Contract Areas (Highways Agency 2010)](image)

The MAC contract is based predominately on an alliancing and partnering contracting philosophy with aspects of traditional performance-based contracts. According to the Highway Agency’s contract guidance manual, the MAC contract utilizes “co-operative working arrangements for delivering mutually agreed common objectives”. The
Highways Agency also seeks to promote long-term relationships with its service providers by emphasizing continual improvement with detailed performance measurement. The performance measurement system will be discussed in section 7.5. To better understand Alliancing and partnering there will be a brief discussion regarding key points of this contracting approach.

7.2 Alliancing Delivery Model

Alliancing is an innovative delivery method similar to Early Contractor Involvement (ECI) used on both construction and maintenance projects. In addition to England’s extensive use of this method/approach, countries such as Australia and New Zealand have also been using this method as means to solve contracting issues. Contracting issues such as dispute resolution, quality control and even slow project delivery time have been solved with alliancing methods compared to traditional contracting. The alliancing model essentially brings the contractor on earlier during the planning phases to assist the owner or public agency. When using the alliancing delivery method the Alliance Team or Contractor is selected based upon 100% Quality Criteria as opposed to lowest bid price or combination (e.g., 50% Quality/50% price). Basing the selection on only quality criteria allows the owner to focus on value-for-money principles. The value-for-money principles are seen throughout the selection criteria for the alliance team. Proposals are evaluated based upon quality factors such as (Manley 2002):

- Technical Expertise and Experience
- Current commitments
- Whether the contractor would be trustworthy, cooperative and flexible.
- Industrial relations record
- Project alliance experience
- Safety record
- Financial and management resources
- Relationships with sub-contractors and suppliers
- Quality and time record
- Claims and disputation record
- Environmental management
- Risk Management
- Insurance Claims

Once the winning team is selected, they will begin to assist the owner with design and programming as well as helping to determine a target price for the project. The Alliance model includes concepts such as the pain/gain share scenario in relation to meeting the estimate target price. If the team meets the estimated target price then a reward (gain) is given to the team, if the target price is missed then a penalty (pain) is imposed on the team. Rewards and penalties are usually within a ±15% range. The team can also gain an extra bonus for performing well in various “Key Result Areas or Indicators” agreed upon at the start of the contract. Key Results Areas (KRA’s) measure both quantitative and qualitative performance of the contractor. This use of KRA’s and Indicators is commonplace with the Alliancing and Partnering delivery methods. Figure 32 is a graphic taken from the Finnish Road Administration report entitled, “International Overview of Innovative Contracting Practices for Roads” which has a substantial amount of information on integrated project delivery methods. Figure 32 shows the structure of a project Alliance.

Throughout the research, it was noticed that domestic DOT’s have not been using this project delivery method. The lack of use can most likely be attributed to legislative mandates requiring a low-bid award system. Similar to Alliancing is Partnering which has made its way into USDOT contracting. Partnering differs from Alliancing in that Partnering is only a relationship management system and not a formal delivery system (Manley 2002). Alliancing is a combination of the two and is a more complex version of Partnering that is needed on larger projects. Alliancing uses contractually established commercial drivers to reward service providers for positive project performance (Manley 2002). According to a report by Dr. Karen Manley, “Partnering and Alliancing on Road Projects in Australia and Internationally”, Partnering is a “commitment…to meet separate but complementary objectives…” by all parties on a project (Manley 2002). An owner or agency can have an Alliancing contract with a Partnering charter included; as opposed to a partnering based contract. The charter is simply a cooperation agreement signed by all stakeholders/beneficiaries involved in the project. The idea behind a partnering charter is to promote positive relationships amidst an industry often plagued by rivalries and mistrust. A good example of a USDOT using a charter would be North Carolina Department of Transportation (NCDOT). NCDOT’s first pilot projects around
Charlotte metro area included partnering charters with contractors. The partnering charter was used during pre-start up meetings to better align agency and contractor objectives as well as desired outcomes for performance targets.

![Diagram of Alliancing Structure](image)

Figure 32 – “Alliancing Structure” as used UK and Australia (Pakkala 2007)

Used with permission by Pakkala

7.3 HA – Philosophy behind the Managing Agent Contractor program

As discussed in 7.2, the MAC provides maintenance services through a performance-based contracting method, which utilizes a mixture of “Alliancing” and traditional performance-based contracting principles. The program management staff at the Highways Agency felt this method has delivered better results compared to a contracting system based solely on traditional performance-based contract mechanisms (lump-sum and lowest bid). Making the shift from a lump-sum only performance contract to a predominately “Partnering” style contract with multiple levels did not happen overnight. The driving force behind the MAC contract program started in the late 1990’s when UK construction professionals decided to research growing dissatisfaction within the industry. These individuals noticed many issues with current contracts and their handling of business relations. Some of the industry issues were adversarial relations, fragmented supply chains and inability to serve customer needs. Two UK construction industry reports were published by researchers to address the need for change. The two UK reports that shaped the MAC program were:

- “Never Waste a Good Crisis: A Review of Progress since Rethinking Construction and Thoughts for Our Future” (Wolstenholme 2009)

The next two sections will give an overview of these articles and layout the important concepts, which have provided a foundation for the MAC.

Since its publishing in 1998, this report has attracted much attention from all facets of the construction industry as well as other industries (i.e. Asset Management). The Construction Task Force uses this report as a platform for advocating changes in the way industry conducts business. Changes towards a construction industry aimed at achieving greater value for clients as well as an industry that promotes stronger relationships throughout the entire ‘supply chain’. The need to improve according to the Task Force is based on the growing dissatisfaction with construction in both the private and public sectors. The dissatisfaction lies in the unpredictable nature with delivering a project on time, within budget and to the standards of quality outlined at the start of the project. In order to meet the needs of future clients, taxpayers and other stakeholders, the construction industry must look outside their own realm for assistance. The paper outlines other industries that have successfully implemented practices to raise quality standards and improve efficiency. Industries such as manufacturing, retailing and even offshore oil and gas have been able to increase performance, customer satisfaction and contracting relations by promoting an integrated project process. Integrated project processes such as “Partnering” and “Alliancing” are two methods according to the article that have realized savings consistently around 30% (Egan 1998). Application of these processes is advocated by the Task Force for implementation on construction projects.

The integrated project process is unique because the entire project team works in a more collaborative manner than a traditional construction contracts. An example would be a program or project level panel composed of stakeholder representatives (owner, contractor and suppliers). The panel would audit performance evaluations and participate in dispute resolution proceedings. The higher level of collaboration within integrated processes allows stakeholders to add project value. Value is added when constructors and suppliers can add input to planning and design phases to increase constructability and final operations and maintenance decisions. This added expertise and collaboration allows all stakeholders to view each other’s plans and together formulate a list of objectives and desired outcomes. These practices are in great contrast to the traditional segmented and fragmented process that is often tied to a Design-Bid-Build approach.

The Task Force’s intentions with the report is not just to reveal industry problems but state new innovative practices, suggest possible solutions and assist with the improvement process. To assist the industry in improving its fragmented culture, the Task Force outlines a method by which change can occur.

The Task Force dictates drivers that are needed to stimulate change before improvements can be realized. The five key drivers for change are (Egan 1998):

- Committed leadership;
- A focus on the customer;
- Integrated process;
- Team integration around the product;
- A quality driven agenda; and
- A commitment to people.

Once these five drivers are integrated within the cultural mindset then transformation can begin taking place. Without these drivers the current paradigm of lowest bid and segregated stakeholders will remain.

To integrate these drivers for change the Task Force makes some suggestions. The first is the idea of setting performance targets that are clear and can be easily measured. The performance targets must also be tailored towards the client’s view of performance as well as areas that would help add value to a project or program. As mentioned earlier, client dissatisfaction stems from poor performance in time, cost and quality on projects. These three project factors serve as the recommended starting point for performance indicators within the construction industry. It is important to note that the Task Force only supplies the initial ideas and leaves the door wide open for innovation in making a performance measurement system fit a particular project or program need. The adoption of performance targets, integrated supply chains and quality agenda are ideas used by the Managing Agent Contractor
system at Highways Agency. Table 35 is an excerpt from the “Rethinking Construction...” report detailing the suggested areas for performance measurement. In addition to Table 35 is a list below of additional indicators that could possibly be used for measuring performance on a project, throughout a program or monitoring a particular service provider (i.e., MAC contractor).

Additional performance indicators that may be of use for monitoring performance:

- Initial cost (annual change on a like-for-like project basis);
- Initial cost predictability (variation from design stage to delivery);
- Construction time (annual change on a like-for-like project basis);
- Construction time predictability (variation from design to delivery);
- Client satisfaction with the final product;
- Client satisfaction with the service provided;
- Productivity (value added per employee);
- Profitability;
- Incidence of defects in completed project; and
- Safety.

Table 35 and the previous list of performance indicators demonstrate the endless amount of ways clients, constructors and suppliers can measure service performance. To see more indicators from this report see Exhibit F.1 in Appendix F. Embedding the above performance measurements within an integrated project process such as Alliancing and partnering can assist in bringing higher levels of value to the client’s final product. The Task Force also presents some ideas on how to implement an integrated and partnered supply chain:

- Acquisition of new suppliers through value-based sourcing;
- Organization and management of the supply chain to maximize innovation, learning and efficiency;
- Supplier development and measurement of suppliers’ performance;
- Managing workload to match capacity and to incentivize suppliers to improve performance;
- Capturing suppliers’ innovations in components and systems.

Table 35 - Key Performance Indicator sample (Egan 1998)
The suggestion of a “continual improvement program” is another important idea integrated into the MAC contracts from this report. Having this type of program would allow the project or program team to evaluate performance and work practices currently in use. Learning from mistakes and hearing from all project stakeholders would enable a faster improvement process.

The final chapter of the “Rethinking Construction” report touches on additional ways to guide the “Way Forward”. Emphasis is placed on ideas such as improved working conditions for workers at all levels and better training programs to assist an integrated project process. These two additional recommendations are important so that workers can perform at their highest and drive performance. The need for demonstration projects is also discussed as a manner to test the new delivery methods and performance indicators. The next report is a follow-up report describing 10 years since the groundbreaking report to improve the industry.

7.3.2 “Never Waste a Good Crisis: A Review of Progress since Rethinking Construction and Thoughts for Our Future” (Wolstenholme, 2009)

Authoring the Constructing Excellence organization, this report discusses the lack of progress that has been made in regards to the goals set out by Sir John Egan in ‘Rethinking Construction’. The Constructing Excellence organization was formed in response to Sir Michael Latham’s 1994 report ‘Constructing the Team’ and Sir John Egan’s 1998 report ‘Rethinking Construction’ as a means to promote, monitor and improve the agenda set out by these two reports. According to the 2009 report many in the industry have begun adopting portions of the philosophies set out in ‘Rethinking Construction’, although the adoption is seen as only “skin deep”. The atmosphere in the industry remains highly adversarial with firms seeking to exploit risks for their own financial benefits. Mr. Wolstenholme’s view is that the recommendations set out in the previous report must be implemented if the industry is to remain competitive. In addition, he feels that the conversation must now shift from “Is this the right type of change?” to “What is preventing the change from occurring within the industry?” The goal of this report is to identify the key blockers of change in the industry and to prescribe ways of overcoming them.

The Constructing Excellence team reviews the ‘Rethinking Construction’ report first before identifying blockers. The main purpose of the review is to describe the progress since the 1998 report by Sir John Egan. The strongest body of evidence according to the 2009 report is the approximately 500 demonstration projects that are monitored by the Excellence team. See demonstration results in results in Figure 33 and Figure 34.

![Figure 33 – Demonstration Projects: Safety (Wolstenholme 2009)](image-url)
The use of demonstration projects was a key suggestion in the Egan report, for testing key performance indicators of an integrated project. The demo projects also show industry skeptics that philosophies set out in Egan’s report could prove advantageous. The demonstration projects have proved successful by outperforming the industry in many key performance indicators (i.e., Safety).

Performance indicator data on both the industry and demonstration projects are collected yearly and analyzed. All results are reported in the ‘Industry Performance Report’ published by Constructing Excellence. The report allows project managers to benchmark their performance against the industry. Reports have showed the demonstration projects have outperformed the industry in areas such as Safety and Time (Wolstenholme 2009). The demonstration projects tended to outperform the industry in 2008 by 19% overall. Most notably in safety that saw an 80% improvement; project predictability was also 10-20% better (Wolstenholme 2009).

The remaining portion of the report identified factors within the industry that are preventing cultural change from happening. Constructing Excellence decided to conduct surveys with industry professionals in order to gain feedback on the reluctance to change delivery philosophy. The data received showed a trend of four major blockers, which professionals felt, were causing change issues. The four change blockers were business and economic models, capability, delivery model, and industry structure. The four blockers are described in more detail below (Wolstenholme 2009):

Business and Economic Models – The absence of an industry wide push for change has made various sectors progress at various rates with respect to adopting the vision of ‘Rethinking Construction’. The public sector although it accounts for 40% of the construction demand still relies on lowest price and fails to use the performance measurement as a way to achieve best value. The one exception to the public sectors failure at adoption is the Highways Agency who has embraced the change and used performance measurement of its contractors. The current economic issues including the recession are an addition factor causing clients to stick to what they know best; traditional procurement.

![Figure 34 – Demonstration Projects – Project Delivery Time (Wolstenholme 2009)](image)
Capability – To improve the effectiveness of the industry change there needs to be an effort to attract the brightest and best. The industry lacks the ability to change because of the lack of project managers and other project personnel who can integrate the project and effectively deliver performance measurement systems. Companies have either underestimated this need or completely neglected the need for a formal training program. There needs to be a coordinated effort to promote the industry so that new talented workers are attracted. The article mentions there are smart people in the industry but there needs to be more. A suggestion from the team is to integrate with universities and technical schools to formulate more effective construction programs for students.

Delivery Model – There has been a lack of using the integrated project processes laid out in the previous studies. Even with the demonstrations projects showing the potential benefits, the industry still resists change. With traditional methods there is also a need to fix risk mitigation techniques instead of simply passing it down the supply chain. Tendering process needs to focus on whole life cycle cost. The tendering process should shift away from completely price based to a system that incorporates best-value and lowest waste. The Construction Excellence team suggests open book accounting would help promote a more integrated team by creating opportunities for contractors to innovate and bring higher value. The open book accounting will also help create alignment of parties and interests.

Industry Structure – The industry lacks a single voice that promotes a message of change. Too many groups have controversies over the new ideology. There needs to be a joined thinking approach by government agencies and other stakeholders so that polices become clear and concise. The industry bodies need to work together and begin overlapping programs that will fit together seamlessly. Governments should develop policies that will incentives those thinks that bring value to the public.

The two reports ‘Rethinking Construction’ and ‘Never Waste a Good Crisis’ give rise to some helpful project ideas that can bring together project stakeholders for an improved end product in construction. In addition to these reports there was a 1994 UK report called “Constructing the Team” by Sir Michael Latham that also discusses collaborative working environments for construction. Performance improvement using partnering and benchmarking have been successfully incorporated into many industries besides commercial construction such as highway maintenance with the MAC program at the Highways Agency. Partnering is among numerous asset management best practices that could potentially help VDOT’s Maintenance program. Subsequent sections will look into MAC program scope of services and performance management system.

7.4 Area #1: Scope of Services

7.4.1 Managing Agent Contractor

Before discussing the MAC scope there must be a basic understanding regarding the contract roles. The Managing Agent Contractor system engages numerous parties for the delivery of maintenance and capital works services. The system is based on the alliancing delivery model discussed earlier. The contract guidance manual defines these six major roles within a MAC contract (Highways 2010):

- **The Employer** – Highways Agency.
- **The Service Manager** – team leader responsible for the area network and key leader in acting as the owner’s representative for contract management services.
- **The Provider** - appointed to carry out the services for the duration of the contract period. Services include routine and winter maintenance of the motorway as well designing renewal and improvement schemes deemed sufficient in improving network value. Other obligations include fabricating, delivering, constructing, managing, supervising, testing, commissioning and other administrative processes that go beyond the scope of a contractor as defined in the NEC3 which the MAC is based off. Contractor input in
design is part of the Egan’s philosophy and helps add-value to other phases of procurement normally foreign to traditional constructors.

- **The Managing Agent Contractor** (MAC) – the team between the *service manager* and *provider*. The MAC in addition to the roles above also has the opportunity to participate in budgeting and allocation of funds related to maintenance projects in their respective maintenance area.

- **The Network Board** – in charge of promoting a partnering atmosphere and is made up of senior members from both the provider and employer. The board cannot change the contract but is supposed to provide guidance towards carrying out the employers objectives. The board also recommends performance targets for the works and reviews the performance data. Continual improvement is also demonstrated through reviewing best practices on maintenance projects and sharing this information with other projects under Highways Agency control. Learning from what works best and what does work progresses the MAC program.

- **The Adjudicator** – Third party appointed by the provider and employer to deal with any project disputes. A form of alternative dispute resolution and helps to reduce time caught in legal disputes.

The various roles within the contract have specific purposes for helping the Highways Agency reach its overarching goals. The use of the “Network Board” is a direct example of where Alliancing and Partnering philosophies were adopted from the two UK reports on integrating the project process and promoting a continuous improvement. Table 36 was taken from the guidance notes and describes how the MAC principles promote partnering and the collaborative atmosphere in a variety of ways. Using the numerous partnering principles in Table 36, the Highways Agency is able to direct the Managing Agent Contractor in a manner that provides highway quality maintenance services. Here is a summary of MAC management assets and scope of services:

- **Routine and Periodic Maintenance services** (i.e., *Winter Maintenance*).
- **Scheme Management**
  - *Identification, design and implementation of capital renewal and improvements up to $12 million.*
  - Proposed schemes above $12 million are called “Managed Works” and are publicly tendered and managed by MAC.
  - *First year or contract, MAC can design and deliver projects of £500k (~750k). This amount increases by 2.5% each year of the contract up to $12 million threshold.*
- **Contract Administration and Management for Managed Works** (Includes pay certification on behalf of Highways Agency.)
- **Network Management**
- **Quality Management**
- **Incident response and initial response to critical defects on the Area Network**
- **Performance Monitoring (Self Inspections)**
- **Environmental Management**
Performance measurement system in the MAC contract has many parts to ensure the MAC is maintaining the network in manner that will meet Agency desired outcomes. The Highways Agency’s performance measurement framework is based on “Motivating Success” – A Toolkit for Performance Measurement. This tool kit includes both qualitative and quantitative performance systems. All requirements for the assessment of performance are located at the Highways Agency website under the performance Toolkit (http://www.highways.gov.uk/business/15098.aspx).

Under the performance measurement framework the managing agent contractor is assessed based on:

- Quality Management System – Includes Quality Plan by the provider that details processes and sub-process for dealing with defects on the network. The Service Manager audits the Providers quality plan for managing the network defects (Exhibit F.2 in Appendix F). Exhibit F.2 provides information on the quality system and audits. The provider accrues points for deficiencies in their quality plan. The service manager or employer can conducts audits.

- API’s (Area Performance Indicators) which resemble the requirements in the VDOT MRP. Minimum tolerances for various assets along the network. Used by the contractor for the self-inspections of network.

- Key Result Areas (KRAs) – the MAC is evaluated in eight areas of measure for how well they can derive works processes to help the agency achieve goals. This framework helps the agency evaluate the contractor in more than one dimension. The use of KRA’s provides a well-rounded evaluation (Exhibit F.3 in Appendix F).

### Table 36- Managing Agent Contractor: Partnering Principles (Highways 2010)

<table>
<thead>
<tr>
<th>MAC Partnering Principle</th>
<th>Partnering Benefit</th>
<th>Partnering Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long contract duration (4-7 years)</td>
<td>Long term work leading to common understanding of project and risk</td>
<td>Successful delivery of business objectives for the Highways Agency and its partners</td>
</tr>
<tr>
<td>Performance measurement (benchmarking)</td>
<td>Delivery of best practice and promotion of innovation</td>
<td></td>
</tr>
<tr>
<td>Performance measurement (continual improvement)</td>
<td>Organisational learning and sharing of knowledge</td>
<td></td>
</tr>
<tr>
<td>Payment mechanism</td>
<td>Equitable rewards for partners</td>
<td></td>
</tr>
<tr>
<td>Communication/ relationship management</td>
<td>Reduction in disputes and improved decision making</td>
<td></td>
</tr>
<tr>
<td>Quality Management</td>
<td>Robust procedures and improved service delivery</td>
<td></td>
</tr>
<tr>
<td>Risk Management (Shared risk register)</td>
<td>Greater financial certainty for all parties involved in the contract</td>
<td></td>
</tr>
<tr>
<td>Self supervision (Audit and certification)</td>
<td>Removal of duplication of effort as partners concentrate on their core skills</td>
<td></td>
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</table>
The eight “Key Result Areas” are known as areas of measure and are aligned with the Highways Agency business objectives and desired outcomes. The areas of measure are (Highways 2010):

1. **Product** - the degree to which the delivered product meets expectations.
2. **Service** - the degree to which the service during delivery meets or exceeds expectations.
3. **Right First Time** - the impact of re-working and defects.
4. **Cost** - the degree to which costs are controlled.
5. **Time** - the degree to which key deliverables meet or exceed agreed completion dates.
6. **Safety** - The degree to which the risk of harm to persons or damage to facilities is limited.
7. **Team Culture** - To establish the extent to which behaviors and attitudes of all team members have a positive or negative influence on the outcome of a project. This is measured by the Agency Cultural Assessment Framework.
8. **Client Performance** - To establish the performance of the Highways Agency in fulfilling its Client role under the contract, using the 360-degree “Supplier Feedback Report”.

Table 37 - MAC Performance Framework (Highways Agency 2009)  
Used with permission by Highways Agency

7.5.1 **Payment for Services and Performance**

Various payment mechanisms are used in the MAC contract. Instead of solely using the traditional lump-sum approach, the MAC combines three methods:
• Routine Maintenance, Periodic Maintenance and Network Management – Lump Sum (Monthly Fixed Payments)
• Renewal and Improvement Projects (up to ~$750k) – Derived Price (Target Cost)
  o Provider is reimbursed the direct costs plus a fee.
• Renewal and Improvement Projects (~$750k to $12 million) – Cost Reimbursable (Time and Materials)

7.6 Area #3 – Performance-Based Contracting Results

The use of the Managing Agent Contractor program has seen numerous benefits with cost savings, innovations and safety improvements. The UK has seen a substantial decrease in the amount of accidents on the network since using the MAC contracts (Clark 2010). The NCHRP 389 synthesis reports cost savings at a minimum of 10% in England. “A-one +”, a MAC consortium for numerous maintenance areas has created four interesting innovations while performing services (Halcrow 2011):

• Durakerb® - environmentally sound recycling. A-One+ is working with local authorities to collect recyclables and reuse them to make durable long lasting curbs.
• GullyHawk – ITS device for monitoring debris build up in drainage systems. Monitoring can be done from the office and allow fewer unnecessary inspection trips.
• Retriever – motorcycle provides fast retrieval of broken down and abandon cares along the roadway.
• Overhead Line Markers – assists with risk management and helps emergency personnel when attending to incidents on the network.

England’s highway maintenance program has benefited from using the innovative MAC approach but in recent years, the economy has forced another change. The Highways Agency will be evolving the MAC contracts and replacing them with a new form that has greater emphasis on day-to-day maintenance and less on long-term road improvements. The new contract dubbed Asset Support Contracts (ASCs) will take cost of services into greater account than the MAC contracts had. The MAC contract had a 70 (Quality):30 (Cost) ratio and the new contracts will be 50:50 ratio. The new contracts will be taking effect around July 2012. The official announcement for the ASC contracts came in March 2011 along with the Highways Agency Business plan for 2011/2012. The agency hopes to fully complete the MAC to ASC transition by 2015 (Highways 2013).

7.7 England's Highways Agency – Evolution Timeline

Table 38 displays England’s Highway Agency evolution since 1980. Highlights from England’s road agency include the first performance-based maintenance contract in 2000 with the MAC program. The Managing Agent Contractor program was the focus of the mini-scan study section on England. Events prior to 2000 display the important milestones that enabled the MAC program to take place. The single major procurement event in England history enabling the MAC program was the Private Finance Infinitive in the United Kingdom passed in 1992. The follow are some other major events in England’s procurement and contracting history:

• First ECI (Early Design-Build) project
• PFI Initiative for P3 style arrangements
• Introduction of Managing Agency Contractor
• Local Government program for devolution
### Table 38 – England’s Highways Agency Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>Procurement and Contracting Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981</td>
<td>● The Ryrie Rules were formulated by a National Economic Development Council (NEDC) working party in 1981 under, Sir William Ryrie. Mr. Ryrie was the Second Permanent Secretary to the Treasury at that time (Allen 2003).</td>
</tr>
</tbody>
</table>
| 1988 | ● Ryrie Rules revised to stimulate growth in previously nationalized industries (Allen 2003):  
  o Accounted for schemes such as contracting out, opting out, mixed funding and partnership schemes.  
  o Private finance could be introduced if it yield cost effectiveness.  
  o Privately used funds for projects had to be accounted for on Government expenditure sheets. It was essentially a public sector guarantee on the private funds being used. |
| 1989 | ● Ryrie Rules retired by John Major, then Chief Secretary to the Treasury. Reasoning was to encourage and expand private sector involvement (Allen 2003). |
  o Provides the legal framework for street and highway works.  
  o Legislation covers entire United Kingdom and all road authorities including Highways Agency. (Allen 2001) |
| 1992 | ● Private Finance Initiative (PFI)  
  o PFI supersedes previous “Ryrie Rules”. (Allen 2001) |
| 1993 | ● Chancellor, Kenneth Clarke decides PFI needs a boost due to low level of interest from both sides; public and private. Autumn 1993, he announces the creation of a Private Finance Panel (PFP). Panel will help stimulate the private sector interest and generate new ideas. (Allen 2001) |
| 1994 | ● Latham Report – “Constructing the Team”  
  ● The Highways Agency (HA) was established, as an executive agency separate from the parent Department of Transportation. HA was given direct responsibility for operation of the core trunk road and motorway network.  
| 1995 | ● Michael Jack, then Financial Secretary, produces new PFI handbook; Private Opportunity Public Benefit, progressing the Private Finance Initiative. Lessons learnt from the first PFI projects. |
| 1996 | ● Highways Agency establishes 24 “Super agencies”. Prior to 1996 the Highways Agency had a role in operations and maintenance of the network. 91 Local Authorities using direct labor were in charge of network upkeep. |
| 1997 | ● Modernizing Government initiative changes procurement laws from only competitive to allowing tendering based on best value system. |
  o The Construction Task Force formed.  
  ● In the 1998 "Roads Review" The Government made road maintenance the number one priority for the Highways Agency. |
| 1999 | ● In 1999 the "The Review of Trunk Road Maintenance Procurement"  
  o Lays out procurement options for future operations and maintenance agreements.  
  ● Local Government Act – Introduces “Best Value” procurement to local authorities. |
### MAC era

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
</table>
| 2000 |  - Managing Agency Contractor (MAC) is born. Road maintenance condensed into 14 management areas over the next five years.  
- TechMAC introduced alongside MAC for operations and maintenance to communications infrastructure.  
- UK Government's “Revitalising Health and Safety” initiative guides direction for procurement and performance measurement process. |
| 2001 |  - The first MAC contract came into operation in Maintenance Area eight in Northamptonshire in September 2001.  
- 20 maintenance areas covering the whole of the trunk road and motorway network in England (excluding London which is managed by TfL).  
- First Piloted ECI project (Early Design-Build).  
  - A500 Stoke pathfinder project (Matthews 2001). |
| 2002 |  - MAC Internal Review. |
| 2005 |  - eMAC introduced and only used for Area #2. |
| 2010 |  - “Never Waste a Good Crisis” |

### ASC era

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011 – 2012</td>
<td>- New Asset Support Contracts to replace MAC.</td>
</tr>
</tbody>
</table>

#### 7.7.1 Department of Transport & Highways Agency (1990 – 1995)

The Department of Transport (DfT) and executive agency known as the Highways Agency, have undergone substantial procurement evolutions in highway construction and maintenance over the past 30+ years. The most profound procurement changes occurred in the mid-90’s. One of the major milestones in the United Kingdom was the 1992 Private Finance Initiative (PFI). The United Kingdom’s PFI had profound implications on England’s Highways Agency and it’s construction and maintenance program.

The PFI was announced by Chancellor, Norman Lamont, at the 1992 Autumn Statement. The PFI is a form of public-private partnership (P3) agreement (Allen 2003). PFI is a subset of the Public-Private Partnership arena; PFIs are characterized by either concessions or franchises. Before the PFI passing, governments were not eager to involve private sector finance on public projects. Procurement laws called “Ryie Rules” which established how private finance was to be introduced in public sector projects. Road construction was on of the government areas these rules did not allow private sector finance. Prior to the PFI legislation, the Department of Transport had the primary role of road builder using public funds and unit priced-based delivery. The passing of the PFI enabled the Department to deliver increasingly complex projects through a different procurement framework than previously used. The Department began to take on the role of “asset manager” as compared to “road builder”. The PFI enabled the use of private funds to deliver public transportation projects.

The PFI set out to create partnerships between public and private entities at multiple levels; central government and local authority. Although the PFI is a form of P3 agreement, there are some distinctions between the UK PFI and other P3 style arrangement offered by other nations (Allen 2003):

- The PFI is different from Privatization because under PFI, the public sector retains a substantial role in projects. Roles such as the major purchaser of services.
- The PFI is different from contracting out because the private sector provides the capital asset as well as the associated services.
- The PFI allows the private sector to finance the project unlike other forms of P3 agreements.

The public sector does not own an asset under a PFI project, instead the PFI contractor is supplied a stream of committed revenue payments for by the public entity for using the facilities during the contract term. Upon
completion of the contract term, the ownership of the asset can remain with the private sector contractor, or be returned to the public entity (Allen 2003).

The 1992 PFI initiative set the stage for the performance-based programs put in place by the Department of Transport and Highways Agency throughout the 1990’s. The performance-based culture has lasted until present day and can be seen in both construction and maintenance areas at the Highways Agency. In 1994, the Highways Agency became an executive agency to DfT and took over the role of operating, maintaining and improving the strategic network.

In 1997, there was a change of procurement laws driven by the Modernizing Government initiative. The program set out to change procurement from competitive compulsory tendering to a best whole life value system. This initiative set in motion both industry reports and internal audits of business practice aimed at improving construction and maintenance of transportation facilities. The Managing Agent Contractor program for operations and maintenance services is one product of the 1997 initiative. The next section will discuss the maintenance contracts which preceded and influenced the MAC.


Before 1996, the Highways Agency maintained a supervisory role over 91 local authorities whom maintained the network. The 91 local authorities were finally combined into 24 “Super Agencies” between 1996 and 1997. The Managing Agent role was responsible for investigating and designing large-scale repair works as well as managing and controlling the Term Maintenance Contractor (TMC) in each area (NAO UK). Prior to 1997, the Managing Agent role was held by most local authorities not private consultants. To reduce costs of the MA contracts the Highways Agency implemented an innovative system where MA services were put out for competitive tender. Local Authorities would bid against private sector consultants for the consultant and supervisory role over the TMC.

Managing Agent Responsibilities include (Harding & Walker 2004):

- Provide management and consultant advice to the Highways Agency;
- Instruct TMCs to carry out maintenance and construction work up to a threshold of US $200,000;
- Engages in quality control, supervision and payment certification of the TMC’s work;
- Works above the threshold but below $9M, are tendered and carried by other contractors not the TMC. The MA manages non-TMC contracts for works;
- All design work, asset inspections, network maintenance management, and supervision of the Term Maintenance Contractor; and
- 3-year term with possible 12-month extension.

Term Maintenance Contractor Responsibilities (Nutt 1999):

- All routine, cyclical and winter maintenance; and small capital maintenance and improvement works up to a limit of $200,000;
- Provides an emergency cover service; and
- Three-year term with possible 12-month contract extension.

The MA/TMC maintenance team would also be required to interface with other contracting entities besides themselves. The Regional Communication Maintenance Contractor who was in charge of all motorway and trunk road communications equipment across numerous areas would work in tandem with the MA/TMC team. Contractors perform major maintenance schemes in a MA/TMC are would also be working in coordination. Discrete major maintenance schemes (as distinct from routine, cyclical and winter maintenance) are currently procured by a range of methods, principally using Design and Build, “ICE5” or “ECC” contract forms. As discussed earlier the MA/TMC is allowed to perform work classified as a minor scheme compared to the larger major schemes. The
purpose of having a value limit on work allowed by MA/TMC contracts enables the Highways Agency to procure enough contracts through competitive tendering.

During the transition period between MA/TMC and MAC the Highways agency conducted planning sessions to decide the way forward. While formulating the new MAC agreements, the Highways Agency realized the need for balance within the new arrangements. Striking the critical balance between private and public sector stakeholders, and keeping taxpayers and lawmakers on board was not easy task. The Agency dictated three areas for critical balance in their management review statement for the way forward (Nutt 1999):

- Sustaining a steady workload for the Term Maintenance Contractor;
- Supplying work for longer-term Framework contracts to be placed; and
- Maintaining the flow of one-off contracts to a competitive regional/local market.

The Highways agency decided to review the possible impacts of four options for future procurement of services in highway maintenance. The formulation of future evolution options at the Highways Agency is similar to the objective of this thesis. Like the Highways Agency this thesis aims to provide options for VDOT’s future performance-based maintenance contracts. Here were the four proposed options for England’s future according to Peter Nutt - Chief Executive (Figure 35):

- **Option One** – Improving the Existing Managing Agent and Term Maintenance Contractor arrangements with a formal Partnering Board;
  - Key option one elements (Nutt, 1999):
    - Partnering Board containing senior members of the Managing Agent, Term Maintenance Contractor and the Highways Agency. The Board will benchmark performance targets, review investment decisions and encourage innovation. It will also have a role in dispute resolution. Informal Partnering was being used on the original MA/TMC contracts for aligning objectives.
    - The contracts will use a partial performance specification for routine maintenance. This facilitates more innovation in service delivery. Highways Agency intends to use the target cost delivery to a greater degree for cost accountability purposes on improvement schemes. The target price scheme will also offer incentives to the contractors as a means to drive performance.
    - Increased contract duration from three to possibly 5-7 years, and an increased threshold for work the Term Maintenance Contract. The increased threshold aspect was investigated for its impact on many internal and external factors including the impact on regional or local industry marketplaces.

- **Option Two** – Network Contractor and Network Adviser contracts with Network Board. Resembles option 1; however, roles for contractor are greater and include more risk than previously.
  - Key option two elements (Nutt 1999):
    - Increased contractor duties include areas such as quality assurance of the maintenance services. Works delivered by contractor are without direct supervision from the Managing Agent role. The Network contractor takes on increase risks such as highway management. This shift in risk allows the Network Advisor to focus on strategic planning of maintenance, design and life cycle costing of maintenance services.
    - A Network Board replaces the Partnering Board discussed in option one. The Network Board differs from the Partnering Board in that it allows the Highways Agency, Network Adviser and Network Contractor to have executive authority for setting performance standards, monitor continuous improvement and ensuring delivery of the services in addition to steering the contract partnering.
- Highways Agency details the need for more “robust” auditing systems for monitoring the contractor’s performance. Performance specifications may be used at a greater degree than in option one.

- **Option Three** – Managing Agent Contractor contracts; single point of accountability.
  - Key option three elements (Nutt 1999):
    - The MAC combines the Managing Agent and Term Maintenance Contractor into a single operating entity to deliver services.
    - The MAC emphasizes a comprehensive quality plan to demonstrate service compliance.
    - Highways Agency audits the MAC to ensure organizational objectives are being met; service delivery, value for money, propriety and accountability.
    - Use of full performance-based specifications for routine and capital maintenance services.
    - Network Board is used and required by the Highways Agency for service delivery and driving the project.

- **Option Four** – Privately Financed Managing Agent Contractor contract (PFMAC).
  - This option was never fully implemented by the Highways agency for highway maintenance.
  - According to Nick Harding, Halcrow, PFMAC was never fully implemented. It was superseded by the M25 DBFO project in England. The PFMAC is essentially a privately financed network maintenance contract with a capital project up front (Harding, 2012).
  - The “son” of the PFMAC called the eMAC will be discussed later in this section. The eMAC used a target cost only scheme for the entire contract; no lump sum payment mechanism.
  - Longer term contract than MAC; between 15 & 30 years. Using payments such as shadow tolls or other innovative mechanisms used on similar projects like DBFO.

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**Figure 35** – Options for Highway Agency future 1999 (Harding & Walker 2004)
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7.7.3 Consulting Questions for path forward (MA/TMC, MAC or PFMAC)

In light of the reports by United Kingdom Government and Sir John Egan, the Highways Agency set out to incorporate the suggested best practices (i.e., integrated team and accountability) into their own agency contracting objectives. Ultimately, the agencies choose option three and delivered the MAC. The fourth option, PFMAC, was essentially the beginning of the DBFO program in England according to Mr. Nick Harding. The new MAC procurement culture included the following components (Highways 2010):

1. Clear points of responsibility; minimizing unnecessary supervision;
2. Partnership approach based on long term relationships;
3. An integrated, tightly monitored and incentivized supply chain;
4. Selection of suppliers on best value; and
5. Fair allocation of risk.
6. Performance measurement with continual improvement targets.

The MAC model, option three, can be seen in Figure 35 on previous page. The numerous options considered by the Highways Agency sheds light on the various evolution paths which could have been the future of England’s maintenance program. These four options are areas for possible investigation by VDOT for a next step in highway maintenance. Each option incorporates the use of a partnering or network board to instill a continual improvement culture. The main question for VDOT and future TAMS evolutions is what level of integrating and risk sharing is the agency willing to split between themselves and the contractor. VDOT may also want to explore whether they would consider implementing the partnering philosophy which both foreign and domestic agency have done.

To guide VDOT and provide insight into how other agencies divide responsibilities, the following two milestones in Highways Agency history show how risks have moved between organizations. The Highways Agency reassumed the maintenance responsibilities from the localities back in the mid-90’s and then began breaking the network up into strategic areas and created a strategic core of roads. Shortly after, local authorities were given back specific responsibilities for some roads based on the devolution mandate handed down in the early part of 2000. The following milestones describe the transition (Highways 2010):

- The Agency has reduced the number of maintenance areas over a 10-year timeframe; from 85 in 1995 to 20 in 2001-02; it reduced the number to 14 by 2003. Originally, localities were in charge of maintenance in the 85 areas. When the reduction of areas started, Highways Agency took back the responsibilities from those local authorities.
- When the Managing Agent Contractor was introduced in England, around 2001, local authorities were only involved in three of the then 20 Areas for highway maintenance.
Highways Agency – England

Figure 36 – England: Highways Agency Timeline

Timeline Legend:
- Country or State Procurement Law
- Maintenance Milestone
- Country or State PBMC Program
- Country or State Evolutionary Milestone

1980
1981
1982
1983
1984
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1986
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1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

1980 - Highway Maintenance Milestone
1981 - Ryrie Rules - Retired
1982 - Private Finance Initiative (PFI) passed
1992 - Highways Agency – Established by Dept. for Transport
1994 - Latham Report “Constructing the Team”
1996 - TechMAC – ITS Area-wide Maintenance
1998 - “Decentralising” implemented: split core & non-core network
1999 - 2000 - 24 maintenance Areas consolidated into 14 Areas
2000 - “Never Waste Good Crisis” by 2010
2001 - 2008 - 1st Performance-Based Maintenance Contract w/ MAC launched in Area 8
2002 - TechMAC – ITS Area-wide Maintenance
2003 - 2004 - Managing Agent Contractor (MAC) program created & TechMac (ITS Area-wide Maintenance)
2005 - MAC variation “eMAC” introduced only in Area #2 2005
2006 - 2007 - 24 maintenance Areas consolidated into 14 Areas
2008 - 2009 - 2010 - 2011 - 2012 - Asset Support Contracts (ASC) replace MAC

Page 117
Figure 36 - England: Highways Agency Timeline
New Zealand – Transport Agency (NZTA)

8.1 Maintenance Program Background

The New Zealand Transport Agency (NZTA) serves as one of four “crown entities” under the Ministry of Transport in New Zealand. The NZTA is responsible for the day-to-day management of the “land transport system” which includes activities such as planning, operating and properly allocating funds to improve system safety and performance. NZTA is the result of a recent consolidation that took place approximately three years ago. On August 1, 2008 the duties of the Land Transport New Zealand (ex. driver and vehicle licensing) and Transit New Zealand (ex. operations and planning) were combined as means to integrate and improve service delivery to the public. The NZTA management structure contains six business groups (see Exhibit G.1, Appendix G for structure):

- The Strategy and Performance Group - works to promote government themes, objectives and strategies and supports the Board’s preparation of the National Land Transport Programme.
- The Planning and Investment Group - works in partnership with local government on regional planning and programming processes.
- The Highways and Network Operations Group - responsible for building, maintaining and operating the state highway network.
- The Access and Use Group - provides services such as driver licenses, motor vehicle registration and also regulates transport operators.
- The Organizational Support Group - ensures we have corporate strategies and policies to support strategy and organizational performance.
- The People and Capability Group - ensures we can deliver on our goals through our people and people capability.

The Highways and Network Operations Group is entrusted with maintaining the countries $23 billion dollar state highway system. The system comprises almost 11,000 kilometers of roads and provides access to around 83,000 km of local roads. Even though the state highways amount to only 11% of the total roadway in New Zealand, the highways carry over half of the countries traffic. In order to maintain and operate this vital system, NZTA uses four diverse contracting methods across 25 network management areas (i.e., maintenance office). Each management area may choose to contract with various amounts of each method depending on their needs. The four main types of contracts used for procurement of maintenance and operations services are as follows:

- Alliancing – Long-term arrangements for groups of organizations. In 2008 a contract was started for the Auckland Motorway Network.
- Performance-Specified maintenance contracts – awarded for 10 years to single supplier for all services.
- Hybrid contracts – 5-year contracts awarded to contractors and consultants in a partnering arrangement format.
- Traditional contracts – awarded for various terms. Consultants manage the suppliers who deliver the physical works on the network.

The focus of this chapter will be on the Performance-specified maintenance contracts; however, the Hybrid contracts should not be overlooked since it also includes performance specifications. NZTA Contract Performa – Appendix B is specifically related to Hybrid contracts (NZTA 2010).

8.2 Area #1: Scope of Services

8.2.1 Performance-Specified Maintenance Contracts (PSMCs)

Performance-specified maintenance contracts are 10-year term contracts funded by a lump sum bid. The performance contracts used in New Zealand are comparable to the Term Network Contracts of Western Australia.
Within the PSMC contracts, there are assigned roles and duties for both the service provider and agency. The major roles and duties identified in the “Conditions of Contract” for PSMCs are:

- **Principal** – New Zealand Transport Agency (NZTA).
- **Contractor** – Service Provider for Maintenance Services, contract allows for a contract representative.
- **Superintendent** – NZTA appointed representative (ex. consultant)
  - May direct variations to the services provided by the contractor.
  - Direction can be give to increase, decrease or omit services, assets or materials used by the contractor.
  - Superintendent directed variations which result in additional scope will be categorized as “Dayworks”. Dayworks prices and rates are quoted by the contractor; approved by Board.
- **Management Board** – Five member dispute resolution board comprised of:
  - Two members selected by the principal
  - Two members selected by the contractor
  - One “Chairperson” selected by the four chosen board members.
  - Duties of Board:
    - **Review and provide recommendations for**: payment claims and performance criteria during contract.
    - **Agree to**: benchmark performance criteria at the contract start, rates and prices for day works, contract modifications due to ‘force major’ events that prevent contractor from delivering services, improvement initiatives proposed by contractor.
    - Hire expert assistance in dispute matters. Cost of acquisition split between contractor and principal.
  - Board meetings held every two months (sooner if requested).

The contractor is required by contact to propose “Improvement Initiatives” on the road network. These proposals are given to the Management Board for review and approval (final approval by Principal). Improvement initiatives are defined as any of the following:

- Reduce maintenance costs and resulting payment;
- Reduced running costs;
- Improved levels of service;
- Improved road safety performance;
- Added functionality (installation of assets to meet user needs.);
- Reduce capital costs; and
- Increase service life to assets.

It is important to note that innovations do not have to reduce the costs of maintenance services. Innovation proposals for example, may add cost to the contract by raise levels of service. If the proposal is agreed upon by the Principal, the contract payments will be altered accordingly. For more information on these proposal requirements see section 1.5.4 of the “Conditions of Contract” in the “NZTA Contract Performa Manual” (NZTA 2010).

Under the Performance-specified maintenance contract, the contractor is to provide services in the following areas:

- Routine and Preventative Maintenance (ex. pavement marking maintenance)
- Incident Response;
- Professional Services (record keeping, various management plans)
  - Quality Plan;
  - Health and Safety Management Plan;
  - Emergency and Contingency Plan;
- Safety Management and Intervention Plan;
- Traffic Management Plans and Maintenance Management Strategy;
- Customer Service; and
- Asset Management (data collection and updating asset inventory).

- Emergency Works – not part of lump sum. Treated as additional works and paid based on an agreed rate (“Dayworks”).

Services Excluded (including but not limited to):
- Major Drainage Control
  - Including all culvert, stormwater structure and drainage maintenance.
- Bridge Maintenance
  - Structural repair and structural maintenance of bridges.
  - Installation, maintenance and removal for bailey bridges (temporary structures used during emergencies.).
- Traffic Services
  - Structural repair and maintenance of gantries.
  - Installation and maintenance of traffic signals, speed camera detectors and emergency telephones. (See Exhibit G.2)
- Professional Services:
  - Rating of bridges for overload capacity.
  - Crash Reduction studies.
- Preventative Maintenance above what is provided for in the lump sum.
- Property Management.

Currently NZTA has five active Performance-Specified Maintenance Contracts throughout the country. Searching through the new NZTA webpage revealed that an additional sixth contract was awarded in July 2011. For a sample scope of services in a PSMC contract (both included and excluded services) please see Exhibit G.2.

8.3 Area #2 – Contract Performance Monitoring

A lump sum contract is paid in equal monthly payments from start to finish during the contract term. Adjustments to these payments are made depending on various factors such as performance or rise and fall in costs. Contractor makes self-inspections but the principal at his or her own cost can hire a third party to conduct formal inspections on the network.

The performance contracts in New Zealand are monitored by three distinct areas of performance measures. The contractor is measured on how well they meet the specified delivery times.

Management Performance Measures – measures how well the contract is being managed as well as professional service delivery. Below are some of the performance areas (Exhibit G.3):

- Meeting and Reporting
- Quality Control – Management plans
- Quality Control – Implementation
- Safety Management
- Asset Management
- Treatment Design

Key Performance Measures – measure the performance of the key asset, the pavement. This performance measure must be in compliance at the end of each year. Key performance measures include aspects of pavement such as skid resistance, roughness and mean texture depth.
Operational Performance Measures – deals with road users day-to-day serviceability expectations. Contractors must comply with both contract standards and response times.

- Pavement – potholes, rutting, etc.
- Vegetation Control – clearances

Compliance monitoring on these three performance areas is a very important part of the PSMC program at New Zealand Transport Agency. The agency must first determine what the benchmarks are and decided time allotted to bring assets up to condition (i.e., grace period if needed). To ensure compliance with Key Performance Areas, NZTA has a sampling process that uses confidence intervals to determine the sampling sites. Sample sites are generated by the Management Board when audits are underway. The audit is to ensure that the contractor is maintaining good inspections practices. The contractor is expected to inspect 100% of the assets in the network. I have included the compliance-monitoring portion of the contract in Exhibit G.4. This may help VDOT in idea generation for new and innovative ways to monitor contractors.

8.4 Area #3 – Performance-Based Contracting Results

New Zealand has seen cost savings with using these arrangements. NZTA mostly uses traditional contracts for maintenance in addition to hybrid contracts. Table 39 some results located:

Table 39 - PSMC from NCHRP 389 Report (Hyman 2009)
Used with permission by TRB

<table>
<thead>
<tr>
<th>Contract(s)</th>
<th>Source</th>
<th>Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>10-year, lump-sum, performance-specified maintenance contracts on part of</td>
<td>Reason Public Policy Institute</td>
<td>20% savings based on regular audits</td>
</tr>
<tr>
<td>the national road network and highway works throughout country; includes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>rehabilitation and maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>World Bank</td>
<td>Less cost according to General Manager of Transit New Zealand</td>
<td></td>
</tr>
<tr>
<td>Highway Maintenance Contracting</td>
<td>30% decrease in cost of professional services and 17% decrease in costs of professional services; a savings of at least 25% over conventional model</td>
<td></td>
</tr>
<tr>
<td>10-year, lump-sum, performance-specified maintenance contract (PSMC-001)</td>
<td>Pekka Pakkala</td>
<td>Initial savings were about 25%, and were between 14% and 20% at time report was written. Savings predicted to be 25%.</td>
</tr>
</tbody>
</table>
8.5 New Zealand Timeline

The New Zealand Transport Agency has been using performance-based maintenance contracts since 1998 and continues today. The performance-based contracts are not however the primary mode of outsourcing maintenance. There are wide ranges of other arrangements used such as traditional method-based contracts and hybrid contracts that are used. The hybrid contracts use a variety of method and performance-based specifications.

Table 40 - New Zealand Transport Agency Timeline

<table>
<thead>
<tr>
<th>Year</th>
<th>New Zealand – Contracting &amp; Procurement Milestones</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td><strong>Road Administration known as the Ministry of Works and Development (MWD)</strong></td>
</tr>
<tr>
<td></td>
<td>• Responsible for policy, safety, design, construction, maintenance, as well as other infrastructure activities for roads (Pakkala, 2002).</td>
</tr>
<tr>
<td></td>
<td>• Ministry self-performed most road construction and maintenance activities.</td>
</tr>
<tr>
<td>1989</td>
<td><strong>Transit New Zealand (Transit) Act 1989</strong></td>
</tr>
<tr>
<td></td>
<td>• Transit New Zealand created to enable integrated planning and funding of roads, passenger transport services, and road safety.</td>
</tr>
<tr>
<td></td>
<td>• Required Transit NZ to implement a competitive environment for the procurement of all professional services (consulting) and highway maintenance (contracting) by <strong>July 1991</strong> (Pekkala, 2002).</td>
</tr>
<tr>
<td></td>
<td>• Competitive Pricing Procedures (CPP) established.</td>
</tr>
<tr>
<td>2002</td>
<td><strong>Local Government Act 2002</strong></td>
</tr>
<tr>
<td></td>
<td>• The LGA encourages a collaborative approach between local and central government.</td>
</tr>
<tr>
<td>2003</td>
<td><strong>Land Transport Management Act 2003</strong></td>
</tr>
<tr>
<td></td>
<td>• Seeks to revise procurement strategies towards best value approach.</td>
</tr>
<tr>
<td></td>
<td>• Section 25 - Procurement Procedures</td>
</tr>
<tr>
<td>2008</td>
<td><strong>Land Transport Management Act 2008</strong></td>
</tr>
<tr>
<td>2009</td>
<td><strong>Local Government (Auckland Council) Act</strong></td>
</tr>
</tbody>
</table>
Place Holder for NZTA Timeline

Figure 37 - New Zealand Transport Agency Timeline
New Zealand Transport Agency (NZTA)

Figure 37 - New Zealand Transport Agency Timeline

10/29/1989
Transit New Zealand (Transit) Act 1989
Competitive Pricing for highway maintenance mandated by July 1991

2/1/1999
1st Hybrid PBC

3/19/1998 - 4/30/2008
1st Performance-Based Maintenance Contract 10 year

5/14/1998
Land Transport Act

6/26/2008
Land Transport Management Amendment Act
Transit New Zealand and Land Transport New Zealand combined into NZ Transport Agency

7/1/2011
PSMC 007 West Waikato
$125,000,000

3/15/2008
Local Government Act

1st Hybrid contract – 5 year term

4/20/1989
Public Finance Act

1/15/1988
State Sector Act 1988

2/28/2002
Local Government Act

Land Transport Act
5/1/1998
1st PBC in New Zealand
3/19/1988

2/1999
9/1999
3/2003
9/2004
3/2006
9/2008
3/2010
9/2012

1980 - 2012
Contract Program Span

Transit New Zealand
and
Land Transport New Zealand
combined into
NZ Transport Agency

Figure 37 - New Zealand Transport Agency Timeline

New Zealand Transport Agency

3/19/1998
1st PSMC in New Zealand
9 The VDOT Performance-Based Experience

This chapter will explore the VDOT experience with outsourcing infrastructure maintenance services over the past 20 years. Discussion on VDOT’s Turnkey Asset Maintenance Services (TAMS) contracts will be the primary focus in addition to other performance-based contracts. Procurement laws in Virginia were examined for their relation to VDOT milestones with using performance-based maintenance contracting. Links between the procurement laws and agency milestones were made in order to track VDOT’s evolution. Researching the evolution path of VDOT helped set the groundwork for Chapter 11, which compares VDOT and other highway agencies based on contracting evolutions with performance-based maintenance. Chapter 11 comparisons were used to make future VDOT contracting recommendations in Chapter 11. The future contracting recommendations for VDOT are based upon other agencies that have had similar evolutionary paths and milestones. Four of the six agencies studied during the mini-scan study (Chapter 2) will be used for comparison to VDOT’s history:

- England - Highways Agency
- Western Australia - Main Roads
- New Zealand Transport Agency
- Florida Department of Transportation

TxDOT and NCDOT have been excluded from the timeline analysis because their programs are not at the same level of outsourcing as the other four agencies. During the mini-scan study TxDOT officials were contacted regarding their experiences with outsourcing maintenance. TxDOT maintenance personnel indicated that large scope performance-based maintenance contracts had mixed results. In response to the average results, TxDOT decided to move towards more method-based style contracts instead of performance-based such as bundled-bid. Bundled-bid contracts are not performance-based in nature, method-based specifications are used to outsource multiple maintenance items on a need-be basis. TxDOT’s decision to drawback the use of large performance-based contracts was the main reasons for not including them in timeline analysis (Chapter 11).

NCDOT is new to performance-based maintenance contracts as of 2007. The agency has only had two pilot projects, the first was terminated and the second is currently underway. Since VDOT is no longer in the pilot project stage with performance-based contracts, NCDOT is not a viable source for future VDOT contracting projections.

The next section will discuss the current performance-based maintenance contracts used at VDOT. The performance-based contracts are not the only agreements used in the Operations and Maintenance program.

9.1 Current State of VDOT’s Operations & Maintenance program

9.1.1 Highway Maintenance – VMS Pilot & TAMS

The current highway maintenance program at Virginia Department of Transportation includes 13 performance-based “Turnkey Asset Maintenance Services” contracts covering 100% of Virginia’s interstate highway system. The interstate highway system became fully outsourced in July 2009 after the 2006 Virginia General Assembly mandated outsourcing on the entire interstate system. Virginia General Assembly passed HB-667 (LIS 2012):

§ 33.1-49.1. Contracts for maintenance of components of Interstate Highway System.

All maintenance on components of the Interstate Highway System in Virginia, excluding frontage roads, shall be carried out under contracts awarded by the Commonwealth Transportation Commissioner and approved by the Commonwealth Transportation Board pursuant to § 33.1-12, except for instances where good and sufficient reasons for not doing so shall have been shown in advance in writing by the Commonwealth Transportation Commissioner to the Commonwealth Transportation Board and to the
chairmen of the House Committee on Transportation, the House Committee on Appropriations, the House Committee on Finance, the Senate Committee on Transportation and the Senate Committee on Finance. Nothing in this section shall be construed to prevent the Virginia Department of Transportation from performing emergency work at any time on the Interstate System with its own employees or agents or to assume the maintenance responsibilities of a contractor who has been determined to be in default or as a result of a contract termination.

2. That the provisions of this act shall not apply to asset management or maintenance services agreed to as part of the initial provisions of an interim or comprehensive agreement entered into for the construction or reconstruction of or improvements to any highway pursuant to the Public-Private Transportation Act of 1995 (§ 56-556 et seq.) of the Code of Virginia.

3. That the provisions of this act shall become effective July 1, 2006; however, between July 1, 2006, and June 30, 2009, the Commonwealth Transportation Commissioner shall develop and plan and execute the provisions of this act to fully contract all work as required no later than June 30, 2009.

The Virginia General Assembly action to mandate maintenance outsourcing stems from two major milestones in Virginia/VDOT history. The passing of the Virginia Public-Private Transportation Act (PPTA) in 1995 and the first performance-based pilot contract with VMS. The 1995 PPTA allowed private contractors to submit unsolicited proposals to VDOT for improving transportation facilities. Under the PPTA legislation, VMS proposed the use of performance-based maintenance on the interstate highways. The unsolicited proposal convinced VDOT to move forward with a formal asset management contract (5.5 year term) that began in 1997 (renewed 2001). The contract totaled $131.6 million for services covering portions of Interstates 95, 81, 77, and 381; and included all work, labor, materials, services, and equipment necessary to meet the asset performance standards (JLARC, 2001). The contract covered approximately 25% of Virginia’s interstate system. Figure 38 displays a map of Virginia and the pilot project location.

After the first 5.5 years, VDOT decided to renew for another 5 years based on positive results (2001 – 2006). Between 2000 and 2001 the Joint Legislative Audit and Review Commission (JLARC) of the Virginia General Assembly conducted a performance audit to determine if the pilot had achieved desired outcomes. In January 2001, JLARC published “Review of VDOT’s Administration of the Interstate Asset Management Contract”. This report and others regarding VDOT’s contracting practices were relatively positive and recommended that VDOT use more performance-based contracting to improve asset maintenance in Virginia. The reports by JLARC convinced the General Assembly to mandate outsourcing of interstate maintenance in 2006 (after the pilot concluded).
In order to meet the 2006 mandate VDOT developed the Turnkey Asset Maintenance contracts after the pilot concluded in 2007. The TAMS contracts were modeled based on the best practices developed during the pilot project. The TAMS program helped VDOT reach the outsourcing mandate prior to the July 2009 deadline. Figure 39 is a map produced by the Virginia Department of Transportation indicating the 13 TAMS contracts and locations (Porter 2010).

The TAMS contracts have evolved since the first round of tendering began between 2006 – 2007. The original 10 year pilot project (1997 - 2007) included resurfacing which is not included in current contracts. This thesis separates the TAMS contracts into two versions. TAMS version one (2007 – 2010) had stricter performance requirements, deductions for non-compliance and auditing protocols. The TAMS version two (2010 – Present) decreases the level of stringent requirements in an effort to reduce costs of maintenance services. This shift in contracting strategy is in response to decreasing operations and maintenance budgets caused by the financial crisis in 2008. The revised yearly cost projections for TAMS version two contracts is ~$674,415 a year compared to version 1, ~$2,138,088 yearly cost.
In addition to operations and maintenance services on the interstate (covered by TAMS), VDOT is responsible for a substantial amount of primary, secondary and other smaller roads. According to the VDOT website, there are ~57,867 miles of roadway under the state-maintained system (VDOT 2012). The system can be broken down into the following categories (VDOT 2012):

- **Interstate** - ~1,118 miles of four-to-ten lane highways connecting states and major cities.

- **Primary** - ~8,111 miles of two-to-six-lane roads connecting cities and towns as well as providing access to interstates.

- **Secondary** - ~48,305 miles of local connector and county roads. Arlington and Henrico counties maintain their own county roads.
  
  - Henrico County (1,279 miles) and Arlington County (359 miles) maintain their own roads with VDOT funds. There is an additional 39 miles of toll roads maintained by others.

- **Frontage** - 333 miles of frontage roads.

VDOT also financially supports a separate road system maintained by cities and towns. The cities are separate maintenance areas from the counties in which they are located (VDOT, 2012).

The performance-based approach applied to interstates via TAMS program has not yet reached the lower level roads in Virginia. Lower level roads such as Primary, Secondary and others are either maintained by in-house staff.
or outsourced using traditional method-based contracts such as bundled bid contracts. The TAMS contracts do not include major capital works such as rehabilitation and reconstruction for items pavements, bridges and major assets. These capital works are delivered under traditional contracts (Porter, 2010). The original pilot project (1997) under the PPTA did include capital works such as resurfacing.

9.1.2 VDOT – Facilities Maintenance

In addition to the highway maintenance program, VDOT has other performance-based asset management initiatives for facilities and electrical/ITS assets. In 2010, VDOT issued a Request for Proposals (RFP) offering private firms an opportunity to operate and maintain a portion of Virginia’s 42 Safety Rest Areas (RFP: 118-FH). VDOT intended to solicit sealed proposals that would establish multiple contracts using a competitive negotiation procurement strategy. The RFP indicates that VDOT intended to award five regional maintenance contracts: Bristol, Salem, Richmond, Staunton/Culpeper, Northern Virginia (eVA 2012). The RFP states that a performance-based contracting approach will be implemented and performance specifications are provided for the contractor.

The regional maintenance approach to facilities resembles actions taken by other states. Both Texas DOT and Florida DOT have area-wide facilities contracts for maintaining rest areas. Florida has even included weigh stations and wayside parks in their performance-based maintenance contracts. VDOT’s five contracts for Safety Rest Area property management and maintenance were awarded in November 2010. The contracts include performance-based measures in three main areas (eVA 2012):

- Safety Rest Area site/grounds performance measures;
- Safety Rest Area building performance measures; and
- Water, waste, and waste water treatment, plant lift stations and generator systems operations requirements.

Successful contractors were awarded based upon a “Best-Value” system where each bidder submitted a price and technical proposal to VDOT; price was not the sole factor for award. The best value approach allowed VDOT to engage in competitive negotiations with contractors to locate the best possible project team. Each regional contractor is paid based on fix monthly payments reflecting their initial estimates for routine maintenance. Contractors are also involved with administration of emergency services and major repairs that are paid for on a cost-plus fixed fee basis (eVA, 2012). The following is a sample of the monthly payment schedule dependent on performance levels:

Score

- Between 100 – 91% (100% of monthly payment request)
- Between 86 – 90% (90% of monthly payment request)
- Between 80 – 85% (85% of monthly payment request)
- Between 75 – 79% (%50% of monthly payment request)
- Below 75% (25% of monthly payment request)

9.1.3 VDOT - Intelligent Transportation Systems (ITS) Maintenance

In addition to Safety Rest Areas VDOT recently began a performance-based initiative for electrical and ITS assets. In January 2012, the Commonwealth of Virginia’s Office of Transportation Public-Private Partnerships (OTP3) issued a Request for Information (RFI) to the private sector, requesting comment about integrating five major Traffic Operations Centers (TOCs) across Virginia. The project intends to address numerous challenges facing the current system (Partridge 2012):

- Varying levels of outsourcing in each TOC for:
● Equipment
● Software
● Operations
● System maintenance and management
● Technical support

- Organizational structures and resources vary across TOCs
- Two different ATMS systems across five TOCs:
  - Hampton Roads uses the TransDyn DYNAC system
  - Richmond, Staunton, Salem and NOVA uses the Open Roads OpenTMS system
  - Staunton & Salem business systems are inoperable
- Various types of field devices and field communications infrastructure
- There is a mix of modern and legacy ITS devices with varying capabilities

Figure 40 displays the current layout of the five Traffic Operation Centers in Virginia, which operate and maintain the Intelligent Transportation System (ITS) infrastructure.

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According to the RFI documents provided online, the project will be awarded to a single provider who will effectively combine the five centers for improved operations and maintenance services. The single provider will be responsible for managing six main areas of work shown in Figure 41. The specific project objectives named in the RFI Webinar are (Patridge 2012):

- Financing, developing, implementing, and operating and maintaining a new state-wide ATMS platform
- Maintaining ITS/IT field devices and communications systems
- Operating TOC system, dispatch services, incident management program, and emergency operations
- IT maintenance and system administration
The new ITS project under the OTP3 office resembles the statewide contract administered in Western Australia (TCIC). The single point provider method for not only maintenance but management and capital works makes the new project very similar to Western Australia’s contract back in 2000. VDOT’s evolution towards a single point provider and performance-based approach illustrates progression towards increased outsourcing resembling international highway agencies. The VDOT evolution with ITS operations and maintenance marks another milestone towards greater integration between public and private stakeholders.

The next section will discuss procurement milestones that have opened the door for innovative project delivery and performance-based contracting at VDOT. All major projects mentioned previously TAMS, Rest Areas, ITS are the results of Virginia legislation allowing innovative privatization techniques. Learning about Virginia legislative history offers an opportunity to compare Virginia and VDOT’s history to other countries and highway agencies. Comparisons of contracting and procurement evolutions can help VDOT and other Virginia public entities rethink procurement methods to improve the quality of public services.

### 9.2 Milestones in Virginia Procurement Legislation

The Virginia Department of Transportation has been involved with outsourcing to private vendors for over 30+ years. Various procurement law events have occurred over time creating outsourcing opportunities that were non-existent prior to 1980. Each piece of legislation sets the groundwork for future alterations to procurement policies and procedures. The legislation discussed in this section can be considered a living, breathing document, which constantly evolves with the changing tides in the political arena.

#### 9.2.1 Virginia Public Procurement Act (VPPA) (1981)

The passing of the Virginia Public Procurement Act in 1981 marked Virginia’s first attempt to purchase goods and services from the private sector (Virginia Code, §§2.2-4300). The VPPA allowed state and local agencies to purchase goods and services in the following categories (Hefty & Wiley 2005):

- Goods (purchase or lease)
- Services
Insurance

Construction (*not including infrastructure*)

The VPPA does not cover the purchase or sale of real estate. The VPPA set the initial procurement policy framework for the Commonwealth and its associated agencies. The VPPA permits the use of two types of procurement processes:

- Competitive sealed bidding through an “Invitation For Bid”
  - Purchase of goods, non-professional services, construction and insurance.
- Competitive negotiations through a “Request for Proposals”
  - Professional Services

Procurement procedures vary throughout the VPPA and specifically for competitive negotiation of professional services contracts. The VPPA procurement procedures establish guidelines for contract award such as the “lowest responsive and responsible bidder” philosophy under competitive sealed bidding. In addition, public entities are permitted to reject all incoming bids and rebid under certain conditions. The rebid authority given may not be abused and Virginia law requires three criteria for bid rejection:

- There is evidence that a rebid would result in more competition;
- The low bid was too high; or
- Protest was made that seems to have some validity.

Procurement by competitive negotiation follows its own set of guidelines for public bodies delivering projects. Competitive negotiation is used for projects where scope is difficult to specify or price is not the most important factor. The public entity must first provide a written explanation detailing the reasons for using a Request for Proposals (RFP) compared to the traditional Invitation for Bid process (IFB). The VPPA distinctly details not only the process by which negotiations should take place but how protests and ethics are handled during business transactions. For more information on VPPA, procurement policies and procedures see the Virginia Code online at the Virginia General Assembly – Legislative Information System.

9.2.2 Public-Private Transportation Act (1995)

The Public-Private Transportation Act of 1995, located in § 56-556 of the Virginia Code, is the legislative framework enabling the Commonwealth of Virginia, local governments and certain other public entities, to enter into agreements authorizing private entities to develop and/or operate qualifying transportation facilities. The Virginia PPTA allows solicited and unsolicited proposals to be considered for procurement of qualify projects. The act also allows innovative financing strategies to be used including user fees or services payments. An important distinction between the VPPA and PPTA is the proposal selection process and applicability of previous guidelines under the VPPA. The PPTA is not subject to the older VPPA process for evaluating solicited and unsolicited projects. According to the PPTA implementation guidelines at VDOT’s website, the procedures set out are consistent with Virginia §2.2-4301 (VPPA laws); however, per §56-573.1 proposals are not subject to the Virginia Public Procurement Act (§ 2.2-4300 et seq.):

§ 56-573.1. Procurement.

The Virginia Public Procurement Act (§ 11-35 et seq.) shall not apply to this chapter; however, a responsible public entity may enter into a comprehensive agreement only in accordance with procedures adopted by it which are consistent with those of § 11-37 to the extent such section applies to the procurement of "other than professional services" through competitive negotiation as defined in §§ 11-37 and 11-48. Such responsible public entities shall not be required to select the proposal with the lowest price offer, but may consider price as one factor in evaluating the proposals received.
Prior to the PPTA legislation, the VPPA required public entities to procure non-professional services using an invitation for bid. The PPTA opened the door allowing competitive negotiations for non-professional services.

The PPTA law also describes requirements for asset management, which were not enacted during the first pilot contract with VMS for interstate maintenance. In 2002, the PPTA was amended adding sections 3 and 4 that mandate competitive sealed bidding for highway maintenance (LIS 2012):

§ 56-573.1. Procurement.

3. Interim or comprehensive agreements for maintenance or asset management services for a transportation facility that is a highway, bridge, tunnel, or overpass, and any amendment or change order thereto that increases the highway lane-miles receiving services under such an agreement, shall be procured in accordance with guidelines that are consistent with procurement through "competitive sealed bidding" as defined in § 2.2-4301 and subsection B of § 2.2-4310. Furthermore, such contracts shall be of a size and scope to encourage maximum competition and participation by agency prequalified contractors and otherwise qualified contractors.

4. The provisions of subdivision 3 shall not apply to maintenance or asset management services agreed to as part of the initial provisions of any interim or comprehensive agreement entered into for the original construction, reconstruction, or improvement of any highway pursuant to Chapter 22 (§ 56-556 et seq.) of Title 56 and shall not apply to any concession that, at a minimum, provides for (i) the construction, reconstruction, or improvement of any transportation facility or (ii) the operation and maintenance of any transportation facility with existing toll facilities.

This section of the PPTA code is the reason VDOT TAMS contracts (2007-2012) are procured using a 2-Step Invitation for Bid instead of an RFP process (VMS pilot 1997).

9.2.3 Design/Build and Construction Management Review Board (1996 - 2011)

The review board was enacted by the Virginia General Assembly in 1996 to review submissions from public bodies other than the commonwealth. The board consisted of 9 members appointed by the Governor who would collective the proposed construction projects. The following is snapshot of VA code from Virginia Acts of Assembly -- 1996 Reconvened Session (April 17, 1996) (LIS 2012):

§ 11-41.2:2. Design-build or construction management contracts for public bodies other than the Commonwealth; eligibility requirements; award of contract; records to be kept.

A. While the competitive sealed bid process remains the preferred method of construction procurement for public bodies in the Commonwealth, any public body other than the Commonwealth may enter into a contract for construction on a fixed price or not-to-exceed price design-build or construction management basis provided the public body complies with the requirements of this section and has obtained the approval of the Design-Build/Construction Management Review Board (the Review Board) pursuant to § 11-41.2:5.

The review board effectively became obsolete after the PPEA was passed in 2002. Agencies no longer had to proceed using the board for approval to use Design-Build or Construction Management delivery methods.

The Design-Build Construction Management Review Board (DBCMRB) process relates to building construction projects and not transportation facilities. The Virginia Department of Transportation did not have the ability to authorize design-build contracts for transportation projects prior to 2001. Prior to 2001, the design-build
method could only be used if the project was proposed under the PPTA legislation by a private entity. In 2001, the General Assembly of Virginia amended and reenacted § 33.1-12 of the Code of Virginia allowing the CTB (VDOT’s executive board) to use design-build. This amendment gave VDOT the ability to use integrated project delivery as a contracting method. The Alternative Project Delivery Office at VDOT currently manages the Request for Qualifications (RFQ) and Request for Proposals (RFP) as well as short-listing of proposers and awarding for Design-Build contracts.

9.2.4 Virginia Public-Private Education Facilities and Infrastructure Act (2002)

The PPEA legislation was passed in 2002 as an avenue for public entities to use competitive negotiation instead of competitive sealed bidding. The PPEA builds on the success of the PPTA legislation by offering public entities alternative procurement for non-transportation facilities (Folk 2005). The PPEA opened the door for public-private partnerships and innovative project delivery in areas such as schools and technology infrastructure. Similar to PPTA, PPEA guidelines dictate that a private entity must either submits an initial proposal in response to a solicitation or as an unsolicited proposal. Public entities using the PPEA route for procurement must justify in writing the purpose for using competitive negotiation on project usually procured with competitive sealed bidding.
9.3 VDOT & Virginia Procurement & Contracting Timeline Table

(Timeline begins on next page)

Table 41 - Virginia/VDOT Tabular Timeline

Orange = Virginia Procurement Event

Blue = Federal Procurement Event
<table>
<thead>
<tr>
<th>Year</th>
<th>Virginia State &amp; Federal Procurement Law Events</th>
<th>Virginia DOT Events - Including Maintenance Division Events</th>
</tr>
</thead>
</table>
| **1981** | **Virginia Public Procurement Act (VPPA)** – first attempt to standardize the purchase of goods and services by state agencies and local governments.  
- *The VPPA applies to four types of procurements:*  
  1. Goods (purchase or lease)  
  2. Services  
  3. Insurance  
  4. Construction (not infrastructure)  
- VPPA - The purchase or sale of real estate is not covered by the act.  
- The VPPA establishes two main types of procurement processes: competitive sealed bidding and competitive negotiations. The competitive negotiation process for procurement of professional services has a distinct set of guidelines, which must be followed.  
- Stricter guidelines for procurement officials involved with the process. Guidelines related to the acceptance of gifts and employment restrictions for government officials going to work with contractors they had prior business.  
- The VPPA does not apply to infrastructure project where private sector can have an ownership interest. |  
| **1986** | **Virginia Department of Highways and Transportation** changes official agency name to **Virginia Department of Transportation (VDOT).**  
- A special session of the General Assembly expands revenue sources for transportation, including a new emphasis on airports and seaports. State transportation board is expanded from 12 to 15 members. (VDOT 2012) |  

Virginia Maintenance & Procurement Law Evolution Timeline (VDOT 2012)
<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
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<tbody>
<tr>
<td>1988</td>
<td><strong>Virginia Highway Corporation Act of 1988</strong>&lt;br&gt;• Authorizes the construction of new toll roads without the use of eminent domain.&lt;br&gt;• First attempt to authorize private sector participation in the submission of transportation proposals. The act allows private companies to build and operate for-profit toll roads.&lt;br&gt;• The Dulles Greenway was built under the authority of this act.</td>
</tr>
<tr>
<td>1988</td>
<td><strong>Virginia General Assembly</strong> authorizes the issuance of $600 million in bonds for upgrading the 500-mile-long U.S. Route 58 corridor.</td>
</tr>
<tr>
<td>1989</td>
<td><strong>The Virginia General Assembly</strong> authorizes the issuance of $600 million in bonds for upgrading the 500-mile-long U.S. Route 58 corridor. <strong>Dulles Toll Road extension approved</strong> by the Commonwealth Transportation Board (CTB) in 1989.</td>
</tr>
<tr>
<td>1990</td>
<td><strong>The Virginia General Assembly</strong> designates the secretary of transportation as chair of the CTB. <strong>Commonwealth Transportation Board</strong> grows to 16 members.</td>
</tr>
<tr>
<td>1991</td>
<td><strong>Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA)</strong> (FHWA 2012)&lt;br&gt;• Signed by President George H.W. Bush; lays the guidelines for states to complete transportation planning processes. Act helps to structure the visioning for future transportation agencies.&lt;br&gt;• Emphasizes preservation and improved use of existing roads, and promotes funding to reduce congestion and air pollution.&lt;br&gt;• (ISTEA, Public Law 102-240)&lt;br&gt;• Virginia’s funding for highways increased dramatically through ISTEA — from $290 million annually to an average of $436 million.</td>
</tr>
<tr>
<td>1991</td>
<td><strong>Virginia Public Finance Act of 1991</strong>&lt;br&gt;• Codifies the process through which local governing bodies may issue bonds to private sector.</td>
</tr>
<tr>
<td>1992</td>
<td>Since 1992, 23 U.S.C. § 133 has provided funding for “transportation enhancement activities” as part of a state’s federal allocation for its Surface Transportation Program. It is unlawful for a state to fund TE activities below threshold described in federal code (23 U.S.C. § 133(d)(2)), so that funds for TE projects are effectively a mandatory part of a state’s Surface Transportation Program. Yet they may be lawfully transferred to other federal-aid highway programs under the Uniform Transferability Provision (23 U.S.C. § 126) (NTEC, 2010). (FHWA 2012)</td>
</tr>
<tr>
<td>1993</td>
<td><strong>General Assembly Senate Joint Resolution No. 241</strong>&lt;br&gt;• Establishing the Joint Subcommittee Studying Privatization of Certain State Government Functions. (MWAA, 2012)</td>
</tr>
<tr>
<td>1994</td>
<td><strong>General Assembly Senate Joint Resolution No. 17</strong>&lt;br&gt;• Extending the Joint Subcommittee's study from 1993.&lt;br&gt;• 1994 General Assembly passage of the <strong>Qualifying Transportation Facilities Act</strong>. (MWAA 2012)</td>
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<tr>
<td>Year</td>
<td>Virginia State &amp; Federal Procurement Law Events</td>
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| 1995 | **Public-Private Transportation Act (PPTA) of 1995**  
- The Act is the culmination of previous actions by the Commonwealth to authorize private sector participation in the submission of transportation proposals. | **The Dulles Greenway opens.** The opening marks the nations 1\textsuperscript{st} private toll road in over 150 years. (About VDOT) |
| 1996 |  
- VA General Assembly enacted **Va. Code 11-41.2:2 thru 11-4.2:5**  
  Creating the **Design/Build and Construction Management Review Board**  
  - Allowing local governing bodies to procure using Design-Build option for building facilities not infrastructure. | **1\textsuperscript{st} Performance-Based Pilot Project for Highway Maintenance**  
- Initial Period: Dec 1996 to June 2002 ($131.6M)  
- Renewal Period: July 2002 to June 2007 ($162M)  
- 250 miles of Interstate (Approx. 1250 Lane Miles)  
- ~131.6 million dollars and 20% of interstate highway system.  
- Resurfacing part of the contract.  
- **Nation’s first outcome based maintenance contract.**  
- Dulles Toll Road - Smart Tag electronic toll collection is introduced |
| 1998 | **Transportation Equity Act for the 21st Century (TEA-21)** (FHWA 2012)  
- A new funding plan, boosts Virginia's share of federal revenue by 62 percent over six years. **Federal funds rise from $415 million annually under ISTEA, to about $617 million per year.**  
- Added scenic or historic highway programs, along with several other activities, to eligible TE activities.  
- TEA-21 authorizes the Federal surface transportation programs for highways, highway safety and transit for the period **October 1, 1997 through September 30, 2003** (MWAA 2012)  
- **June 9, 1998 as Public Law 105-178**  
- It continues most ISTEA's programs and policies but maintains ISTEA's emphasis on local involvement in transportation decision making.  
- **Transportation Infrastructure Finance and Innovation Act (TIFIA)** establish under TEA-21  
- **Interstate System Reconstruction and Rehabilitation Toll Pilot Program** was established in TEA-21 |
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<th>Year</th>
<th>Virginia State &amp; Federal Procurement Law Events</th>
<th>VDOT Events</th>
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<tr>
<td>1998</td>
<td>Gov. Jim Gilmore appointed a <strong>Governor’s Commission on Transportation Policy</strong> to study Virginia’s present and future transportation needs.</td>
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<td>1999</td>
<td></td>
<td><strong>Pocahontas Parkway construction begins.</strong> The parkway is a toll road crossing the James River just south of Richmond, connects Chesterfield and Henrico counties. <strong>PPTA project proposed by Fluor Daniel and Morrison Knudsen</strong></td>
</tr>
</tbody>
</table>
| 2000 | **Virginia Transportation Act of 2000**  
December 2000, **Gov. Gilmore proposed a Transportation Reform Initiative** to reduce the time required for completion of construction projects. |  |
| 2001 |  |  |
|      | ✓ **Joint Legislative Audit Commission (JLARC)** issued report recommending several actions for VDOT to continue asset management approach. |  |
|      | ✓ **Devolution Statute enacted** - In 2001, the General Assembly passed “Devolution Statute.” The statute provides that boards of supervisors in any county that wishes to assume responsibility for any portion of the state secondary system of highways within that county’s boundaries may request the Commonwealth Transportation Commissioner enter into and implement an agreement to do so. This is known as “devolution.”  
- Counties may take over (1) construction only, (2) maintenance only, (3) construction and maintenance, or (4) construction, maintenance, and operations of their secondary system. |  |
|      | ✓ The 175-foot-high **Smart Road Bridge opens**, completing a two-mile test track. |  |
|      | ✓ **2001 Virginia Legislative Session, the General Assembly of Virginia** amended and reenacted § 33.1-12 of the Code of Virginia, relating to powers and duties of the Commonwealth Transportation Board (CTB) authorizing the award of Design-Build contracts  
- **Section** § 33.1-12 (2)(b)  
- **Legislation was sparked by Gov. James S. Gilmore’s commission on transportation policy.**  
- **2001 - HB 2746 Competitive procurement for maintenance of highways, bridges, etc.** |  |

§ 11-45.2. Competitive procurement for maintenance.  

Notwithstanding the Public-Private Transportation Act of 1995 (§ 56-556 et seq.), on or after July 1, 2001, any contract entered into by any public body for the maintenance of any highway, bridge, tunnel, or overpass that was not originally constructed under a comprehensive agreement entered into pursuant to the Public Private Transportation Act of 1995 shall be the result of competitive sealed bidding in accordance with the provisions of this chapter. The Department of Transportation shall seek to maximize the number of potential bidders for any such maintenance contracts through any reasonable means, including limiting the scope of such contracts. For the purposes of this section, maintenance means ordinary maintenance and maintenance replacement.
<table>
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<tr>
<th>Year</th>
<th>Virginia State &amp; Federal Procurement Law Events</th>
<th>VDOT Events</th>
</tr>
</thead>
</table>
| 2002 | **Public Private Education Facilities and Infrastructure Act of 2002**  
- Projects for educational facilities;  
- Facilities that meet a public purpose and that are developed or operated by a public entity;  
- Improvements and equipment to enhance public safety and security of buildings to be principally used by a public entity;  
- Utility and telecommunications and other communications infrastructure;  
- A recreational facility;  
- Technology infrastructure;  
- No clear cut delineation exists between what public infrastructure projects may be procured under the PPEA versus the VPPA;  
- Award can be given under best value criteria;  
- The PPEA prescribes a list of certain items that must be covered in the compressive agreement;  
- “...Far more flexible than the VPPA and fosters innovative and creativity.”; and  
- VPPA prohibits no damages for delay while PPEA permits this contractual clause. | **Pocahontas Parkway, VDOT's first PPTA construction project, opens** with high-speed, open-lane toll collection for vehicles with Smart Tags. |
| 2003 | **Surface Transportation Extension Act of 2003** (FHWA 2012)  
TEA-21 scheduled to expire; however, Congress does not fully reauthorize it. Instead the Surface Transportation Extension Act of 2003 is passed, which effectively extends TEA-21 for five months | |
| 2004 | **Surface Transportation Extension Act of 2004**  
- Congress does not reauthorize TEA-21(1998) and instead passes STEA, which extends TEA-21 a second time. The extension period is two months.  
**Special Experimental Project 15 (SEP-15)** | **First SOLICITED Design-Build project by VDOT**  
- APM Terminals Port Interchange & Transportation Improvements  
Hampton, Richmond and Virginia Beach take over management of local road construction in a legislated **VDOT program called “First Cities.”** |
<table>
<thead>
<tr>
<th>Year</th>
<th>Virginia State &amp; Federal Procurement Law Events</th>
<th>VDOT Events</th>
</tr>
</thead>
</table>
| 2005 | VPPA - In the 2005 session, the General Assembly for the first time created a mandatory preference for Virginia bidders on public contracts.  
PPTA – Modifications and created implementation guidelines for proposed projects | |
| 2005 | **Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU)(FHWA 2012)**  
- August 10, 2005, the President signed into law  
- 5 years, 2005 – 2009  
- A 46% increase over transit funding guaranteed in TEA-21. | |
| 2006 | **Chapter 782 - Acts of Assembly of 2006: Requires all interstate maintenance to be outsourced by July 2009. HB 667**  
- “All maintenance on components of the Interstate Highway System in Virginia, excluding frontage roads, shall be carried out under contracts awarded by the Commonwealth Transportation Commissioner and approved by the Commonwealth Transportation Board...”  
- Part 3 - That the provisions of this act shall become effective July 1, 2006; however, between July 1, 2006, and June 30, 2009, the Commonwealth Transportation Commissioner shall develop and plan and execute the provisions of this act to fully contract all work as required no later than June 30, 2009.  
- § 33.1-49.1.  
Amendments Made by Senate Bill 732, Effective July 1, 2006, Make Design-Build A Bit Easier:  
- Governing body of locality with population in excess of 100,000 can by-pass Design-Build/Construction Management Review Board approval. “These localities, however, must have had a one-time determination by the Design-Build Review Board that the locality has the personnel, procedures and expertise to enter into such contracts.”  
- May now make “best-value” award rather than “lowest cost”  
- Must use procedures consistent with two-step competitive negotiation  
§ 33.1-223.2:16. Localities may use design-build contracts.  
- Construction of transportation projects |  
- VDOT opening of the first design-build roadway project in Virginia.  
- The transportation infrastructure improvements provide access to a new container terminal, which will double the shipping capacity of the Hampton Roads port and fuel the economic growth of all of Virginia.  
**06’ - VDOT Maintenance Highlights**  
Annual Report on Initiatives for Outsourcing, Privatization and Downsizing within VDOT  
HB 676 (2006)  
- VDOT already has outsourced 77 percent of interstate maintenance expenditures prior to the mandate.  
- VDOT will maintain control of the pavement and bridge rehabilitation and reconstruction work by bidding it on a project-by-project basis.  
- VDOT implemented a concession agreement with Transurban (I-895).  
- TAMS program begins. RFPs go out.  
TAMS Version 1 |
<table>
<thead>
<tr>
<th>Virginia State &amp; Federal Procurement Law Events</th>
<th>VDOT Events</th>
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<tbody>
<tr>
<td></td>
<td><strong>07' - VDOT Maintenance Highlights</strong></td>
</tr>
<tr>
<td></td>
<td>• Outsourced 58% of interstate maintenance to Turnkey Asset Management System (TAMS contracts)</td>
</tr>
<tr>
<td></td>
<td>• Consolidated maintenance facility operations from 335 to 248 sites (a reduction of 87 properties), resulting in reduced administrative overhead and increased span of control for superintendents.</td>
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<tr>
<td></td>
<td>• By end of 2007, 2 contracts have begun maintenance operations:</td>
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<tr>
<td></td>
<td>• TAMS – Bristol</td>
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<tr>
<td></td>
<td>• TAMS – Richmond North</td>
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<tr>
<td></td>
<td><strong>FY 2007 Business Plan (Highlights):</strong></td>
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<tr>
<td></td>
<td>• Objective: Staff will evolve from “do’ers” to program managers.</td>
</tr>
<tr>
<td></td>
<td>• VDOT has: Started evolving to program managers with the letting of TAMS maintenance contracts.</td>
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</tbody>
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(Opens a link in a new window) medium_blue
(Opens a link in a new window) medium_green
(Opens a link in a new window) medium_purple
(Opens a link in a new window) medium_orange

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<th>2007</th>
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<tbody>
<tr>
<td>Virginia State &amp; Federal Procurement Law Events</td>
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<tr>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td><strong>2008</strong> Item 458 D. of Chapter 879 of the Acts of Assembly of 2008 - Allows Localities to take responsibility for their construction program.</td>
</tr>
<tr>
<td>HB 1301 Bridge replacement &amp; repair; Transportation Board to award contracts for design-build procurement</td>
</tr>
<tr>
<td>HB 6047 Highway bridge maintenance &amp; reconstruction; Transportation Board to issue contracts for projects.</td>
</tr>
<tr>
<td>• “The Commonwealth Transportation Board may, when it determines that doing so will afford the best value for the project, award contracts for the maintenance and/or reconstruction of highway bridges on a design-build-finance-maintain model.”</td>
</tr>
<tr>
<td><strong>2009</strong> Item 462.05 of Chapter 781 of the 2009 Acts of Assembly – “Blue Print” for a program vision, which aims to improve safety, service and preservation of assets amidst the economic crisis.</td>
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<tr>
<td>I95/395</td>
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<tr>
<td>I66</td>
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<tr>
<td>I495</td>
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<tr>
<td>Woodrow Wilson Bridge</td>
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</tr>
<tr>
<td>Year</td>
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</tbody>
</table>
| 2010 | In July 2010, Governor McDonnell directed the Virginia Department of Transportation (VDOT) to work in partnership with other state agencies to identify and implement long-term strategies to generate new revenues through Virginia’s rest areas.  
  HJR 126/SJR 99: Privatizing Commonwealth’s Rest Areas Report. (Nutter/Herring) - Requests the Virginia Transportation Research Council to study alternatives to the public funding and operation of all or portions of the interstate safety rest areas.  
  HB 1309: Virginia Public Procurement Act. (Scott, E.) - Increases from $2 million to $5 million the amount of all projects in one contract term for environmental location, design, and inspection work regarding highways and bridges awarded by the VDOT Commissioner. Such contract may be renewable for two additional one-year terms at the option of the Commissioner.  
  HB 631/SB 254: Advertising for Bids Construction. (Scott, E./Miller) - Provides that the VDOT Commissioner may let projects costing below $300,000 to contract. The bill further provides that the Commissioner may, at his discretion, build or maintain any of the roads by state or local employees as he may designate, in cases of emergency or on projects costing not more than $600,000. | TAMS v. 1  
  10’ - VDOT Maintenance Highlights  
  • TAMS – Woodrow Wilson Bridge (Last contract with original performance standards).  
  TAMS v. 1  
  • Lump Sum bids – **Equal monthly payments.**  
  • No Resurfacing included.  
  10’ - VDOT Maintenance Highlights  
  • I-64 Culpepper – New revised contracts with scope and performance standards.  
  TAMS v. 2 Revised  
  • Bids by asset groups, **pay for work in place.**  
  • Snow and Ice Removal back to methods based specifications |
| 2011 | **SAVE Program**  
  June 16, 2011 – Secretary of Transportation Sean T. Connaughton announced publication of “**Policy Options for Secondary Road Construction and Management in the Commonwealth of Virginia**”. George Manson University report by Dr. Jonathan L. Gifford (School of Public Policy)  
  • Address how Virginia maintains its ~98,000 miles of secondary roads.  
  2011 - HB 1882 Public Procurement Act; use of best value contracting by localities.  
  2011 - SB 1177 Public Procurement Act; use of best value contracting by localities. | 11’ - VDOT Maintenance Highlights  
  • VDOT Maintenance – Issues statewide Rest Area contract for all 42 of its facilities. This contract includes weight stations.  
  • On March 16, 2011; VDOT issued a request for proposals for the new Sponsorship, Advertising, and Vending Enhancement (SAVE) program, which will enhance visitors’ experiences while maximizing the revenue generating assets of the rest areas.  
  The PPTA Office issues RFI for “**Transportation Operation Center innovative delivery.**” |
| 2012 | SB 260 Virginia Public Procurement Act; use of best value procurement by certain localities.  
  • Authorizes the governing body of a locality with a population in excess of 100,000 to procure construction on a best value procurement basis. | |
9.4 VDOT and FHWA Visio Timelines
Place holder for VDOT and FHWA Timeline

Figure 42 - VDOT & FHWA Visio Timeline
Timeline Legend:

- Country or State Procurement Law
- Country or State PBMC Program
- Country or State Evolutionary Milestone

Very Strong Connection
Strong Connection
Mild Connection

US – Federal Highway Administration
Highway Legislation

1980

Virginia Department of Transportation & Virginia State Procurement Laws

1981 Virginia Public Procurement Act (VPPA)
1988 Virginia Dept. of Highways & Transportation changes name to VDOT
1981 Virginia Public Finance Act
1981 Virginia Highway Corporations Act
1981 Virginia Public Procurement Act (VPPA)
1986 Virginia Public Finance Act
1981 Virginia Public Finance Act
1985 Virginia Public-Private Transportation Act
1991 Virginia General Assembly passes “Devolution” act for Secondary Roads & Design-Build permitted
1992 Special Experimental Program No. 14 (SEP-14) is in Bethlehem
1993 VDOT & Federal Highway Administration (FHWA)
1994 VDOT & Federal Highway Administration (FHWA)
1995 Virginia Public Finance Act
1996 Design/Build & Construction Management Review Board created
1997 - 2002 1st Performance-Based VMS (5 yrs.)
2001 Virginia General Assembly passes “Devolution” act for Secondary Roads & Design-Build permitted
2002 Public-Private Educational Facility Infrastructure Act (PPEA)
2002 Appropriations Act – Blueprint for downsizing
2005 Surface Transportation Extension Act of 2005 Extends TEA-21 again
2005 Virginia General Assembly passes “Devolution” act for Secondary Roads & Design-Build permitted
2006 Virginia General Assembly passes “Devolution” act for Secondary Roads & Design-Build permitted
2006 Surface Transportation Extension Act of 2004 Extends TEA-21 again
2006 VDOT Establishes 5 Regional Traffic Operations Centers
2007 Appropriations Act – Blueprint for downsizing
2007 VMS Pilot Extended for 5 years
2008 Appropriations Act – Blueprint for downsizing
2009 Virginia General Assembly passes “Devolution” act for Secondary Roads & Design-Build permitted
2011 5-Year Rest Area Maintenance contracts
2012 VDOT OIT Office issues RFI to private sector. Desire for state-wide ITS contract
2012 Revisions to TAMS Version 2.0
2012 New Revised TAMS Version 2.0
2012 New Revised TAMS Version 2.0
2011 New Revised TAMS Version 2.0
2011 New Revised TAMS Version 2.0
2010 - 2012 VDOT Pilot Project (3 years)
2009 High Road Maintenance contracts
2008 New Revised TAMS Version 2.0
2008 New Revised TAMS Version 2.0
2007 Revised TAMS Version 1.0
2005 Revised TAMS Version 1.0
2005 Revised TAMS Version 1.0
2004 Revised TAMS Version 1.0
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1980 Revised TAMS Version 1.0

Figure 42 – VDOT and FHWA Timeline

VDOT & Federal Highway Administration (FHWA)
10 VDOT and All 4 Agency Timelines

Figure 43 on the next page displays all four agencies including VDOT and FHWA. The timelines were constructed using major milestones in procurement law and agency contracting evolution. These timelines can also be found in chapters three through nine at the end of each case study. Information was collected from a variety of sources including Transportation Research Board, various government websites and personal interviews with professionals.
PLACE HOLDER PAGE FOR ALL AGENCIES LINED UP

Figure 43 - VDOT & All Agencies Visio timeline
11 Conclusions and Recommendations

The timelines constructed in the earlier chapters were compared and contrasted to the VDOT timeline. Similarities between VDOT’s history and each of the four agencies were mapped using arrows and nodes to connect similar events. Connections between similar events, contracting and procurement milestones were categorized as very strong (VS), strong (S) or mild (M) strength. Connections were also color coded for easier identification. The full list of timeline connections can be read in tabular format in Section 11.5. These connections were used to map the most important connections between agencies. The most important connections are detailed on the Vision charts. The graphical timeline comparisons can be seen in Section 11.1 through 11.4.

<table>
<thead>
<tr>
<th>Connection Strength</th>
<th>Line Depiction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Strong (VS)</td>
<td>← − − − − − − − →</td>
</tr>
<tr>
<td>Strong (S)</td>
<td>← − − − − − − − →</td>
</tr>
<tr>
<td>Mild (M)</td>
<td>← − − − − − − − →</td>
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Figure 44 - Timeline Comparison Sample
The final recommendations for VDOT’s future highway maintenance program are based off the connections identified between VDOT and the other four agencies. Five final recommendations were formulated for improving VDOT’s delivery of highway maintenance and operation services:

- **VDOT Recommendation #1** – Apply performance-based maintenance to the primary and secondary roads as well as other facilities. Currently on Virginia interstates are using performance-based maintenance methods.

- **VDOT Recommendation #2** – Evolve maintenance role from a provider (self-performing) to a strategic network manager similar to Main Roads of Western Australia or England. The VDOT program os the future would have a higher percentage of outsourced work using performance-based methods. The program would also begin to incorporate “Area-wide” format contracts for highway maintenance and other vital infrastructure such as bridges.

- **VDOT Recommendation #3** – Devise a “strategic network” to determine the effective and efficient division of responsibilities between department and localities. Using recent research by VDOT’s planning agencies, maintenance staff should prioritize their services based on most vital routes that were identified.

- **VDOT Recommendation #4** – Shift the focus of maintenance delivery from “lowest cost” to “best value” by integrating the team with a PPTA Pilot project that resembles the Managing Agent Contractor (MAC) program in the United Kingdom. VDOT could essentially devise a “TAMS-MAC” contract and use the PPTA legislation as a vehicle for delivering this new and innovative agreement.

- **VDOT Recommendation #5** – Begin to incorporate KPI’s into the TAMS contracts to help align stakeholder objectives. Possibly devise a maintenance division-level performance dashboard that monitors all the TAMS contracts. This could help monitor which contracts are ahead of the pack and which need improvement.

The five recommendations are all interconnected with similar overlapping ideas. For instance, using performance-based maintenance on primary roads could be part of the contract scope in a new best-value contract, delivered under the Virginia PPTA agreement. Each recommendation to improve VDOT is linked and can be combined in different ways to suite VDOT’s needs.
Section 11.5 is a table detailing the timeline connections that were made between VDOT’s evolution and the four other agencies. There are four separate tables in this section: VDOT-Main Roads, VDOT-FDOT, VDOT-New Zealand, VDOT-Highways Agency. The tables also display how each “Very Strong” link is tied into the five recommendations. Some connections are linked to more than one recommendation.

The following methodology was used to classify links into one of the three categories: very strong, strong or mild.

**Very Strong Links**: Links that support one of the five recommendations for VDOT’s “next step” in highway maintenance contracting. A very strong link shows what the other agency has done in the past or present, and what VDOT may want to do the future to improve services for the traveling public.

**Strong Links**: A supportive contracting or legislation milestones in each country’s history. These milestones enabled performance-based contracting to either, begin or progressively evolve, over time. These strong linkages also tend to lead up to events that are involved with very strong links between the agencies.

**Strong link example**: 1995 Virginia PPTA legislation event can be mapped to England’s 1992 Private Finance Initiative law. The PPTA in Virginia led to VDOT’s first performance-based contract and subsequently other important events in Virginia construction, operations and maintenance. In England the Private Finance Initiative was also a major event enabling England’s first performance-based contract for highway maintenance called the Managing Agent Contractor (i.e., MAC for short).

These two strongly linked events lead into a very strong linkage between VDOT and Highway Agency history, the first performance-based contracts at respective agency. VDOT’s pilot with VMS and Highways Agencies first MAC are very strongly linked because both were awarded based on a best-value system both including capital works delivery in the contract. VDOT turned away from the using the best value system after the pilot while England continued using the integrated approach to a greater degree. Highways Agency went on to realize increased cost savings and better performance from integrating more, not less, which is what VDOT did. The very strong linkage between both agency pilot contracts displays a similarity between the two organizations. The linkage also advocates VDOT moving back to an integrated approach to improve maintenance delivery since the MAC went on to be successful.

**Mild Links** – Other Operations & Maintenance events that may provide VDOT with a new best practice for possible adoption. Links do not connect to thesis recommendations necessarily; however, they do provide insight into how other countries or states are procuring operations and maintenance services.

Section 11.6 will discuss recommendation as well as some results seen by those agencies who have implemented similar strategies.
11.1 VDOT & Highways Agency Timeline Comparison
Figure 45 - VDOT & Highways Agency Timeline Comparison
11.2 VDOT & Main Roads Timeline Comparison
PLACE HOLDER PAGE FOR VDOT and WA

Figure 46 - VDOT & Main Roads Timeline Comparison
11.3 VDOT & New Zealand Timeline Comparison
PLACE HOLDER PAGE FOR VDOT and NZ

Figure 47 - VDOT & New Zealand Timeline Comparison
Timeline Comparison: VDOT & New Zealand Transport Agency

Virginia Department of Transportation & Virginia State Procurement Laws

1980
Virginia Public Procurement Act (VPPA)

1981
Virginia Public Finance Act

1984
Transport New Zealand (Transit) Act 1989

1985
Transit New Zealand (Transit) Act 1989

1990
Virginia Highway Corporations Act

1991
Virginia Public-Private Transportation Act

1992
Virginia Dept. of Highways & Transportation changes name to VDOT

1995
Virginia Public Finance Act

1996
Design/Build & Construction Management Review Board created

2001
Virginia General Assembly passes "Devolution" statute for Secondary Roads & Design-Build permitted

2002
Public-Private Educational Facilities Infrastructure Act (PPEA)

2003
VDOT Establishes 5 Regional Traffic Operation Centers

2006
Mandated 100% Outsourcing for Interstate Maintenance by mid-2009

2007
5 - Areawide Rest Area Maintenance contracts

Figure 47 - VDOT & New Zealand Timeline Comparison

New Zealand Transport Agency (NZTA)

1980
Public Finance Act

1981
Transport Act 1980

1986
Virginia Dept. of Highways & Transportation changes name to VDOT

1988
Competitive Pricing for highway maintenance mandated by July 1994

1990
1st PBMC in New Zealand

1998
1st PSMC in New Zealand

1998
Pilot Program initiated

2001
1st Revised TAMS (Version #2) launched w/ modified standards.

2007
VDOT Establishes 5 Regional Traffic Operation Centers

2008
Land Transport Act

2009
Local Government Act

2010
Land Transport Management Amendment Act

2011
Transport New Zealand & Land Transport New Zealand combined into NZ Transport Agency

2012
PSMC 007 West Waikato $125,000,000

Timeline Legend:

- Country or State Procurement Law
- Maintenance Milestone
- Country or State PBMC Program
- Strong Connection
- Very Strong Connection
- Mild Connection
- Very Mild Connection

Timeline Comparison: VDOT & New Zealand Transport Agency

Figure 47 - VDOT & New Zealand Timeline Comparison

2012
VDOT OFTP Office issues RFI to private sector, Desire for statewide ITS contract

2007
Turnkey Asset Maintenance Services (TAMS) program launched

2001
Virginia General Assembly passes "Devolution" statute for Secondary Roads & Design-Build permitted

1997
1st PBMC in Virginia

1997 - 2002
1st Performance-Based Maintenance Contract w/ VMS (5 yrs.)

2006
Mandated 100% Outsourcing for Interstate Maintenance by mid-2009

1999 - 2004
1st Hybrid contract – 5 year term

2003
Transport New Zealand & Land Transport New Zealand combined into NZ Transport Agency

2006
Public-Private Educational Facilities Infrastructure Act (PPEA)

2007
Public-Private Educational Facilities Infrastructure Act (PPEA)

2008
Land Transport Act

2010 - 2012
New Revised TAMS/Version #2 launched w/ modified standards

2011
PSMC 007 West Waikato $125,000,000
11.4 VDOT & FDOT Timeline Comparison
PLACE HOLDER PAGE FOR VDOT and FDOT

Figure 48 - VDOT and FDOT Timeline Comparison
11.5 Timeline Connections Table

This section will display each of the connections found between VDOT and the four agencies studied during the timeline analysis. Link justifications are given in the right most column to help the reader understand why the events were deemed significant.
### VDOT/Main Roads Western Australia Links

<table>
<thead>
<tr>
<th>Link Strength</th>
<th>Link Connected to Recommendation #</th>
<th>Legislation or Contracting Link</th>
<th>Agency</th>
<th>Year</th>
<th>Event</th>
<th>Main Roads of Western Australia</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS</td>
<td>#2</td>
<td>Contracting</td>
<td>VDOT</td>
<td>2012</td>
<td>VDOT RFI requests private sector input for combining 5 Traffic Operations Centers throughout Virginia into single statewide contract.</td>
<td>The VDOT model up until 2012-2013 was five separate regional “Traffic Operation Centers”; however, a recent request for information by VDOT to the private sector displays a desire to consolidate all five centers into one contract. The move to a single contract can be linked back to Western Australia’s 1999 TCIC contract. Separate from Western Australia’s highway maintenance contracts is the TCIC contract allowing private contractors to improve the electrical and ITS assets throughout Western Australia. The TCIC is form of P3 arrangement where a private contractor holds a single state-wide contract for delivering maintenance, rehabilitation and capital works services on traffic control infrastructure. The VDOT “RESPONSE TO QUESTIONS RECEIVED FROM PROSPECTIVE PROPOSERS” (OTP3 Office) indicates VDOT intent to award a contract which may use multiple payment methods (similar to TCIC) for maintenance services and upgrades to the ITS infrastructure. This recent development provides evidence of very strong link. A very strong link between what Main Roads had done and what VDOT is aiming to do in 2012 &amp; beyond according to current actions to go state-wide.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>MRWA</td>
<td>1999</td>
<td>TCIC - Traffic Control Infrastructure Contract (TCIC)</td>
<td></td>
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</tbody>
</table>

Table 42 - VDOT/Main Roads Western Australia Links
<table>
<thead>
<tr>
<th>Link Strength</th>
<th>Link Connected to Recommendation #</th>
<th>Legislation or Contracting Link</th>
<th>Agency</th>
<th>Year</th>
<th>Event</th>
<th>Link Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n/a</td>
<td>Contracting</td>
<td>VDOT</td>
<td>1997</td>
<td>1st Performance-Based Maintenance Contract for Highways launched with VMS, Inc. Pilot project sparked by unsolicited proposal from VMS.</td>
<td>VDOT’s first performance-based contract for maintenance was corridor based (i.e., fence-to-fence on the interstates. Similar to VDOT were Western Australia’s first performance-based maintenance contracts called the TNC’s. Both countries launched around the same time period; however, VDOT only launched one contract unlike Main Roads with all eight. VDOT eventually reached 100% outsourcing on the interstates but not until 2009. The difference in strategic launch of performance-based contracts is why the link is only strong and not very strong. VDOT may want to learn from Main Roads experience in outsourcing with the TNC’s which included capital works.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>MRWA</td>
<td>1999</td>
<td>8 - Term Network Contracts (TNC’s) launched for major highways in WA. First set of performance-based contracts. 6-PBMC and 2-mixed format.</td>
<td></td>
</tr>
<tr>
<td>VDOT Link Strength</td>
<td>VDOT Link Connected to Recommendation #</td>
<td>Legislation or Contracting Link</td>
<td>Agency</td>
<td>Year</td>
<td>Event</td>
<td>Florida Department of Transportation</td>
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<tr>
<td>S</td>
<td>n/a</td>
<td>Legislation</td>
<td>VDOT</td>
<td>1995</td>
<td>Public-Private Transportation Act (PPTA) - Allows the use of innovative project delivery for highways and bridges.</td>
<td>Innovative infrastructure delivery methods in both states expanded around the same time. The PPTA in Virginia and Design-Build law expansion provided both states the ability to procure with performance-based maintenance contracts. The events in both states fundamentally changed the agencies paths for future projects.</td>
</tr>
<tr>
<td>S</td>
<td>n/a</td>
<td>Contracting</td>
<td>FDOT</td>
<td>1996</td>
<td>Design-Build laws expanded as part of &quot;innovative&quot; practices package.</td>
<td>The link is classified as strong because both were sparked by unsolicited proposals from private sector vendors. The contracts also had similar contract length, size and scope. Both used performance-based specification in similar manner. The approach to award was similar using an RFP process.</td>
</tr>
<tr>
<td>VS</td>
<td>#2</td>
<td>Contracting</td>
<td>FDOT</td>
<td>2000</td>
<td>1st PBMC for portions I-75 with ICA. Pilot project sparked by unsolicited proposal in 1999.</td>
<td>These initial contracts change the future of each operations and maintenance program. The FDOT program expanded much more quickly than VDOT’s controlled growth which is an important distinction between each agency.</td>
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<td></td>
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<td></td>
<td>Maintenance Division launches statewide Rest Area contracts.</td>
<td>VDOT’s recent expansion of performance-based maintenance contracts to Rest-Areas links back to Florida’s expansion in 2001-2002. The recent SAVE program for Rest Area’s in Virginia shows VDOT is willing to use performance specifications on assets other than highways. The 2011 milestone also shows VDOT’s move towards wider-area contracts covering larger footprints. VDOT should continue this trend for assets such as bridges or smaller size roads.</td>
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<tr>
<td>Link Strength</td>
<td>Link Connected to Recommendation #</td>
<td>Legislation or Contracting Link</td>
<td>Agency</td>
<td>Year</td>
<td>Event</td>
<td>Link Justification</td>
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<tr>
<td>S</td>
<td>n/a</td>
<td>Legislation</td>
<td>VDOT</td>
<td>2009</td>
<td>Appropriations Act 2009 – Blueprint for downsizing</td>
<td>The downsizing initiative at FDOT back in 2000 maps strongly with VDOT’s 2009 “Blueprint” for downsizing. The downsizing initiatives pushed each agency to expand innovative contracting strategies that deliver cost effective results. The downsizing in Florida can be arguably connected to widely expanding performance-based contracts on smaller roads and facilities. The recent act in Virginia provides VDOT an opportunity to expand in 2012 and beyond with performance-based contracts (i.e., TAMS).</td>
</tr>
<tr>
<td>VS</td>
<td>#1</td>
<td>Contracting</td>
<td>VDOT</td>
<td>2011</td>
<td>George Mason Univ. Report on Secondary Roads – Policy implications</td>
<td>The connection highlights VDOT’s researching of possible solutions for devolution of secondary road system. The GMU report discusses the use of performance-based contracts as one option for consideration by VDOT on secondary roads. The GMU report links to FDOT’s expansion of performance-based maintenance for secondary roads back in 2002. This link supports the next step VDOT TAMS contracts expanding.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>FDOT</td>
<td>2002</td>
<td>1st Asset Maintenance contract for Secondary Roads</td>
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<table>
<thead>
<tr>
<th>VDOT</th>
<th>Florida Department of Transportation</th>
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Table 44 - VDOT/New Zealand Links

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<th>Link Strength</th>
<th>Link Connected to Recommendation #</th>
<th>Legislation or Contracting Link</th>
<th>Agency</th>
<th>Year</th>
<th>Event</th>
<th>New Zealand Transport Agency</th>
<th>Link Justification</th>
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<tr>
<td>S</td>
<td>n/a</td>
<td>Legislation</td>
<td>VDOT</td>
<td>1995</td>
<td></td>
<td>Public-Private Transportation Act (PPTA) - Allows the use of innovative project delivery for highways and bridges.</td>
<td>The LTMA act in New Zealand shifts contracting philosophy from lowest bid and best value to “value for money” and directly connects to Virginia’s PPTA which introduces the best value approach. Both countries have shifted focus on the newer innovative approach to contractor selection. Interestingly the PPTA office in Virginia has recently (As of 2010) updated their PPTA delivery framework to include “Value for Money” terminology the same as New Zealand had in 2003. The move from lowest cost to best value and further on into value for money shows a trend at VDOT. A trend looking into life-cycle costs as opposed to short term immediate cost implications. Just as Value for Money has been used to deliver the Performance-Specified Maintenance Contracts in New Zealand, VDOT should look at how “Value-for-Money” can be achieved with TAMS.</td>
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<td></td>
<td></td>
<td></td>
<td>NZTA</td>
<td>2003</td>
<td></td>
<td>Land Transport Management Act (LTMA) – Contracting philosophy change from lowest bid to value for money.</td>
<td></td>
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165
<table>
<thead>
<tr>
<th>Link Strength</th>
<th>Link Connected to Recommendation</th>
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<th>Agency</th>
<th>Year</th>
<th>Event</th>
<th>Link Justification</th>
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<tr>
<td>VS</td>
<td>#4</td>
<td>Contracting</td>
<td>VDOT</td>
<td>1997</td>
<td>VMS Pilot Project</td>
<td>The VMS pilot project (1997-2007) as opposed to the TAMS contracts (2007 – Present) are closer match with the “Hybrid Model” in New Zealand. The “Hybrid Model” combines method based specifications with performance specifications. The owner/agency still retains the risk for long-term pavement management and daily operations risks are placed with the contractors. The agency has two points of contact compared to one under the Performance-Specified Maintenance Contract (PSMC) style.</td>
</tr>
<tr>
<td>VS</td>
<td>#4</td>
<td>Contracting</td>
<td>VDOT</td>
<td>1997</td>
<td>1st PBMC for portions of interstate highway. Pilot project sparked by unsolicited proposal from VMS.</td>
<td>Owner/agency outsources all risk; short and long-term maintenance. Possible to explore full on PSMC delivery compared to hybrid in VDOT’s next step.</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>NZTA</td>
<td>1999</td>
<td>1st Performance-Specified Maintenance Contract in New Zealand</td>
<td></td>
</tr>
<tr>
<td>S</td>
<td>n/a</td>
<td>Legislation</td>
<td>VDOT</td>
<td>1981</td>
<td>Virginia Public Procurement Act (VPPA) – sets policies and procedures for competitive sealed bidding and competitive negotiations. VDOT follows these regulations today.</td>
<td>Both events show each agency began exploring set guidelines for outsourcing to the private sector vendors using competitive &amp; negotiation methods. The Transit New Zealand Act is more specific towards transportation compared to the VPPA which covers a wider array of agencies in Virginia.</td>
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<tr>
<td></td>
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<td></td>
<td>NZTA</td>
<td>1989</td>
<td>Transit New Zealand (Transit) Act established competitive pricing for highway maintenance. Mandated by July 1991.</td>
<td>Both Acts set guidelines for procurement of professional and non-professional services. The VPPA allowed “Request for Proposals” for Professional Services and “Invitations for Bid” for non-professionals. The Transit Act allowed RFP’s for both professional and non-professional services. This allowed maintenance contracts to be awarded based other factors than just price.</td>
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<tr>
<td>Link Strength</td>
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<td>Legislation or Contracting Link</td>
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<td>Year</td>
<td>Event</td>
<td>Link Justification</td>
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<tr>
<td>VS #1 &amp; #3</td>
<td>Legislation</td>
<td>VDOT</td>
<td>2001</td>
<td></td>
<td>Virginia General Assembly passes “Devolution Statute”</td>
<td>This link supports the next step for VDOT to devolve more roads and create a strategic network. A full government act such as the one in New Zealand would not be suitable in Virginia. Virginia should use this link as an avenue for learning about how NZ formed partnerships with localities. Forcing localities into construction, operations and maintenance works via legislation would be hard for Virginia to implement, especially in towns where O&amp;M personnel are lacking. The New Zealand government mandated the local governments role in areas such as highway maintenance just as England’s highways agency had done in 1999. This link shows the progression of devolution as well as local government interactions with the NZTA agency. The Local Government Act should be explored to improve devolution efforts here in VA.</td>
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<tr>
<td></td>
<td></td>
<td>NZTA</td>
<td>2002</td>
<td></td>
<td>Local Government Act establishes:</td>
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<td>- states the purpose of local government</td>
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<td>- Provides a framework and powers for local authorities to decide which activities they undertake and the manner in which they will undertake them</td>
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<td>- Promotes the accountability of local authorities to their communities</td>
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<td></td>
<td>- Provides for local authorities to play a broad role in promoting the social, economic, environmental and cultural wellbeing of their communities, taking a sustainable development approach.</td>
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Table 45 - VDOT/Highways Agency Links

<table>
<thead>
<tr>
<th>Strength of Link (Very Strong, Strong, Mild)</th>
<th>Link Connected to Recommendation #</th>
<th>Legislation or Contracting Link</th>
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<th>Year</th>
<th>Event</th>
<th>Highways Agency</th>
<th>Link Justification</th>
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<tr>
<td>S</td>
<td>Legislation</td>
<td>VDOT</td>
<td>1995</td>
<td></td>
<td></td>
<td>HA</td>
<td>Public-Private Transportation Act (PPTA) - Allows the use of innovative project delivery for highways and bridges. The PPTA in Virginia was the legislative spark which enabled the first pilot project to commence in Virginia. Similarly, England’s passing of the PFI was the spark which enabled the Managing Agent Contractor delivery (MAC) system. Both legislation milestones led to each agency delivering their first performance-based contract for highway maintenance. The PFI’s effect on the MAC’s ability to integrate the team and allow KPI’s should be investigated by VDOT for possible adoption for the TAMS contracts. The recent MAP-21 legislation passed in the United States may provide some new funding avenues for integrated project delivery.</td>
</tr>
<tr>
<td>Link Strength</td>
<td>Legislation or Contracting Link</td>
<td>Agency</td>
<td>Year</td>
<td>Event</td>
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<tr>
<td>M</td>
<td>n/a</td>
<td>VDOT</td>
<td>2006</td>
<td>VDOT Establishes 5 regional “Traffic Operations Centers” aka TOC’s</td>
<td></td>
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</tbody>
</table>

The establishment of regional Traffic Operations Centers at VDOT in 2006 mimics the launching of TechMac in England in 2000. The use of an area-wide operations and maintenance strategy makes the two events similar; however, the TechMAC includes performance-based specifications and capital works for ITS and electrical assets unlike the TOC’s in Virginia.

Although this link is not a direct 1-to-1 match with England it does suggest VDOT’s path is similar in nature to England’s view of regional operations & maintenance strategies.
<table>
<thead>
<tr>
<th>Link Strength</th>
<th>Legislation or Contracting Link</th>
<th>Agency</th>
<th>Year</th>
<th>Event</th>
<th>Link Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS #1 &amp; #3</td>
<td>Legislation</td>
<td>HA</td>
<td>1999</td>
<td>England enacts “New Deal Detrunking programme” which establishes a detrunking initiative to establish a core &amp; non-core network. Detrunking concluded in March 2009.</td>
<td>The link is very strong because the England program was aimed at creating a core &amp; non-core network. This core network idea is part of VDOT’s next step recommendations. The major difference between the events was England’s was mandatory compared to VDOT’s statute, which is voluntary for localities. VDOT has set up multiple programs under the Local Assistance Division (LAD) to help devolve roads back to local governments. The LAD devolution program includes 4 options for devolution. The use of mandatory devolution is not the next step for Virginia; however, the program in England offers insight into how the agency created their core network scheme which VDOT may benefit from if created.</td>
</tr>
<tr>
<td>VDOT</td>
<td>Legislation</td>
<td>VDOT</td>
<td>2001</td>
<td>Virginia General Assembly passes “Devolution Statute”</td>
<td>The Virginia devolution statute assisted VDOT’s attempt to share secondary roadway responsibilities with localities. This event in VDOT’s history strongly links with England’s “Detrunking” programme to devolve roads to localities. Both initiatives were aimed at devolution to allow each agency to focus on essential roads and save maintenance resources (i.e., equipment and manpower).</td>
</tr>
</tbody>
</table>

The link is very strong because England’s program was aimed to creating a core & non-core network. This core network idea is part of VDOT’s next step recommendations. The major difference between the events was England’s statute, which is voluntary for localities. VDOT has set up multiple programs (LAD) to help devolve roads back to local governments. The LAD devolution program includes 4 options for devolution. The use of mandatory devolution is not the next step for Virginia; however, the program in England offers insight into how the agency created their core network scheme which VDOT may benefit from if created.
<table>
<thead>
<tr>
<th>Link Strength</th>
<th>Legislation or Contracting Link</th>
<th>Agency</th>
<th>Year</th>
<th>Event</th>
<th>Link Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>VS</td>
<td>Link Connected to Recommendation #</td>
<td>VDOT</td>
<td>1997</td>
<td>1st PBMC for portions of interstate highway. Pilot project sparked by unsolicited proposal from VMS.</td>
<td></td>
</tr>
<tr>
<td>#4 &amp; #5</td>
<td>Contracting</td>
<td>VDOT</td>
<td>1997</td>
<td>1st PBMC – Managing Agent Contractor (MAC) program launched. Consolidating original MA/TMC contracts into single-point provider.</td>
<td></td>
</tr>
</tbody>
</table>

Both events marked the beginning of performance-based maintenance contracting for each agency. The event is only moderately strong because scope and integration level (agency/contractor) were drastically different. The similarity was in the “change” mentality at each agency. Both organizations needed change away from the traditional low bid and fragmented delivery process for maintenance. Using the P3 enabling legislation in each state the change was able to occur. VDOT should look to evolve their TAMS contracts towards a more integrate approach with vendors just as the MAC did.

The first VDOT contract included capital works just as MAC did; however, VDOT contractors were engaged in resurfacing only. The MAC contractors conducted capital improvements on a greater scale. The works by MAC contractors would have classified as construction works under the VDOT system.

The MAC also differs from VDOT’s first contract because MAC included performance indicators for quality and teamwork unlike VDOT. Payments to MAC contractors could be either incentivized or disincentivized. The payment scheme was also much more involved with MAC. The MAC had three levels (lump sum, target-cost and cost reimbursable) as opposed to lump sum at VDOT.
11.6 VDOT Recommendations for Future Outsourcing

The following five recommendations are aimed at improving VDOT’s current highway maintenance program. These five recommendations are focused on helping to improve performance (i.e., Level of Service, Safety, Cost Control) with newer innovative performance-based maintenance contracting practices found in the industry. In the previous sections, 8.1 through 8.5, connections were made between VDOT’s procurement and contracting history and that of the other four agencies. Based upon similar contracting milestones and evolution history the following five recommendations for VDOT’s “Next Step” in highway maintenance were formulated. These recommendations seek to build upon current performance-based contracting practices already in use at VDOT (i.e., Turnkey Asset Maintenance Services).

11.6.1 Recommendation #1 - Apply performance-based maintenance contracting (PBMC) to primary and secondary roads as well as other facilities.

The use of performance-based maintenance contracting on highways has increasingly gained popularity with each of the agencies studied. The trend among agencies studied is the initial innovation “spark”, usually a pilot project on a given stretch of roadway. The four agencies studied launched performance-based pilot projects between 1998 and 2001. After the initial project, each of the agencies began expanding their contract scopes because of the benefits realized using the performance contracting over traditional method-based contracts. The performance contracts for highways expanded at other agency’s to cover a wider array of transportation assets (i.e., smaller roadways, stationary facilities and ITS assets).

The strongest timeline comparisons and connections supporting the first recommendation are between the evolutions of Virginia DOT and Florida DOT. Links between the two agencies’ timelines indicate that VDOT’s next step for progressing performance-based contracting should be to implement performance-based methods on smaller sized roads and facilities. Current performance-based methods used on TAMS contracts could be subsequently adapted to meet the current maintenance needs on primary and secondary roads in Virginia. VDOT may also find benefits in applying the performance-based approach to additional facilities such as ITS road assets and weigh stations.

The timeline linkages between VDOT and FDOT supporting this recommendation begin with the launch of each state’s respective pilot project. VDOT launched their pilot in 1997 in response to an unsolicited proposal submitted by Virginia Maintenance Services (VMS) and FDOT launched their pilot in 2000 with Infrastructure Corporation of America in response to an unsolicited private sector proposal. After the initial pilot project, both agencies realized cost and service benefits leading to both agencies expanding their performance-based program. Unlike FDOT however, VDOT waited to expand performance-based contracting until the VMS pilot was completed which allowed time for collection of evidence to support additional performance-based contract use. After the pilot in 2007, VDOT began expanding their performance-based contracts to only the interstates. The targeted expansion of performance contracts to the interstates can be linked to a major milestone in Virginia procurement legislation. In 2006, the Virginia General Assembly mandated 100% outsourcing of all Virginia interstates by July 2009. The mandate was enacted after the pilot project proved to lawmakers that performance-based maintenance contracts could yield an effective alternative to traditional method-based contracts (i.e., method-based = agency dictating the contractors means and methods). The 100% outsourcing mandate drove VDOT to use the newly developed performance-based maintenance contracts as a solution to meeting the 2009 interstate deadline. The performance-based approach used in the pilot project was tailored and improved to correct scope and maintenance issues seen in the pilot. For example, VDOT decided to exclude major resurfacing from the newer revamped contracts, therefore the risk of long-term pavement maintenance fell back onto VDOT. The newer revamped contracts were also customized to the needs of various interstate locations (i.e., adding maintenance specifications for tunnels or extra roadway lighting in various districts. VDOT’s new revamped contracts were called the “Turnkey Asset Maintenance Services” or TAMS for short. The TAMS contracts helped VDOT meet the 100% interstate outsourcing goal. To date, VDOT has continued the TAMS on interstate highways but has not yet expanded these contracts to any other highway networks in Virginia. The other highway systems (i.e., primary and
secondary) under VDOT responsibility are maintained with either traditional method-based contracts or in-house forces.

In contrast to VDOT’s “targeted expansion” on interstates, FDOT launched additional performance-based contracts while their pilot was still in progress. FDOT launched multiple types of “Asset Maintenance” (AM) contracts covering not only interstates but primary and secondary roads as well. The performance-based AM contracts also expanded to stationary infrastructure facilities such as rest areas, wayside parks and weigh stations during the first decade of 2000 (FDOT 7-year pilot began in 2000). The diverse expansion at FDOT compared to VDOT’s targeted expansion can be attributed to a Florida procurement law, which was broader and widespread, than the Virginia 100% outsourcing mandate for interstate maintenance. FDOT was handed an agency wide mandate in 2000 from the Governor that required the agency to downsize by an overall 25% (OPPAGA 2003). The Florida Governor promoted the agenda as way to help FDOT control costs, increase efficiencies and involve more private sector businesses in commerce.

Although VDOT and FDOT performance-based contracting history appear dis-similar, there is actually a critical milestone linkage between them. The linkage begins with VDOT’s 2009 downsizing initiative called the “Blueprint”. Created in 2009, the “Blueprint” for downsizing at VDOT matches up very strongly with the 2000 high level downsizing initiative at FDOT. The 2009 Virginia Appropriations Act created the “Blueprint” and instructs VDOT to downsize resources in an attempt to accommodate new budgetary constraints created by the economic crisis. Since the 2009 introduction of the “Blueprint”, VDOT has been intensely looking at outsourcing more operations and maintenance activities for roads and other facilities in order to meet the widespread downsizing initiative. The “Blueprint” at VDOT provides the Maintenance Division an opportunity similar to that given to FDOT in 2000 for expanding and justifying the expansion of performance-based contracts. VDOT could potentially use the “Blueprint” as leverage to justify TAMS contracts on primary and secondary roads. The performance-based approach on the smaller roadways could help alleviate burdens on in-house resources and help reduce costs. Figure 49 displays the benefits FDOT has seen when using AM contracts over traditional contracts. In contrast to VDOT’s 13 TAMS contracts on the interstates, FDOT has launched over 30+ AM contracts on all types of roads. FDOT even has a performance-based contract with a county level government (Lattner 2005). The AM contract for county level may also provide VDOT a learning opportunity for implementing TAMS with localities.

<table>
<thead>
<tr>
<th></th>
<th>PBC</th>
<th>Method-based contract</th>
<th>In-house</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual Maintenance Cost</td>
<td>$121 m</td>
<td>$139 m</td>
<td>$148 m</td>
</tr>
<tr>
<td>Percentage Cost Savings</td>
<td>13%</td>
<td>6%</td>
<td>0</td>
</tr>
<tr>
<td>Number of contracts</td>
<td>28</td>
<td>993</td>
<td>0</td>
</tr>
<tr>
<td>Number of invoices process annually</td>
<td>336</td>
<td>11,916</td>
<td>0</td>
</tr>
<tr>
<td>Contract advertisements and letting or renewals annually</td>
<td>4</td>
<td>962</td>
<td>0</td>
</tr>
<tr>
<td>In-house maintenance staffing</td>
<td>38</td>
<td>124</td>
<td>3,049</td>
</tr>
<tr>
<td>In-house non-maintenance staffing</td>
<td>2</td>
<td>30</td>
<td>123</td>
</tr>
</tbody>
</table>
| Performance or task oriented | Performance | Task | Performance /

Figure 49 - FDOT Savings: AM Contracts vs. Traditional (Holmes 2005)
Used with permission by Mike Sparberry
It appears that FDOT did not have the luxury of waiting until their pilot was complete like VDOT. The 2000 downsizing initiative in Florida most likely pushed the agency to use the AM contracts as a way to quickly reduce budgets and staffing levels. Just as FDOT did with their maintenance contracts in 2000, VDOT should follow suit and begin their next step in highway maintenance by expanding TAMS to meet the “Blueprint” guidelines.

Figure 50 is a snapshot from the timeline comparisons completed during this research between FDOT and VDOT. The VDOT (top timeline) and FDOT (bottom) timelines contain various milestones over the course of about 30 years (1980 – 2012). The two circular X’s indicate the point where each state had a large downsizing initiative enacted.

The 2009 VDOT “Blueprint” provides a unique opportunity for VDOT to justify the implementation of performance-based contracting on primary and secondary roads as well as additional infrastructure assets. The following three milestones, in addition to the “Blueprint”, suggest VDOT is exploring and expanding the possibilities for performance-based contracting in the future:

- **2011 – VDOT and George Mason University joint research initiative and subsequent report.** The report produced a policy study looking into the secondary road system issues and potential solutions to local

![Figure 50 - FDOT & VDOT Connections](image-url)
government needs for devolution. The report discusses the possible use of performance-based maintenance contracts at the secondary road level as well as address possible barriers to implementation.

- 2012 – VDOT releases five performance-based territorial rest area maintenance contracts.

If a future VDOT TAMS pilot took place on primary or secondary roads, the performance-based contract could be tested in a place such as the Lynchburg District. The Lynchburg District provides a location without any interstate highways passing through which could create clashes with current TAMS contracts. Figure 51 is a map of the VDOT Lynchburg District that includes both primary and secondary roads. VDOT may also want to assess the pilot location by searching for districts where roadways have lower service levels. This may offer an opportunity to see if cost savings and assets could be simultaneously improved.

![Figure 51 - VDOT Lynchburg District Map (VDOT 2012)](image)

In addition to Florida other agencies have and continued using performance-based maintenance contracts on roads other than major interstate-level roadways (i.e., Interstates = USA or Trunk Roads = International). England’s Highways Agency and their Managing Agent Contractors and new Asset Support Contracts both include smaller primary level roads (A-level) as well as major M-level highways. Australia’s new ISA contracts assist local governments with assets on smaller local roads. New Zealand performance-specified maintenance contracts and hybrid contracts are applied to various sized roadways to manage maintenance loads.
11.6.2 Recommendation #2 – Evolve maintenance role from provider to strategic network manager by increasing outsourcing and building on industry best practices for “Areawide” style operations and maintenance contracts.

Since the passing of the Virginia Public-Private Transportation Act (PPTA) in 1995, VDOT has been involving private sector vendors in innovative ways to help reduce costs and effectively deliver projects. For example, the PPTA legislation helped VDOT form the Office of Transportation Public-Private Partnerships (OTP3), which has delivered landmark projects such as the Pocahontas Parkway and new Midtown Tunnel near Hampton Roads. In 2002, the Public Private Educational Facilities and Infrastructure (PPEA) expanded the innovative possibilities for private sector involvement with transportation assets such as Intelligent Transportation Systems (ITS) as well as educational facilities. In addition to Virginia procurement laws, VDOT’s downsizing initiatives provide a favorable climate for building additional private sector relationships and evolving traditional “service provider” mentality to one of “strategic network management”. Evolving VDOT’s traditional role of service provider to network manager for operations and maintenance projects will enable agency staff to focus on higher-level infrastructure challenges (i.e., long-term infrastructure development compared to day-day operations). As a “strategic network manager”, VDOT will continue to investigate areas such as safety improvements, infrastructure life-cycle costs and long-term transportation plans. VDOT, as a strategic manager, will also involve external outside parties to improve goal setting as well as project execution for challenging transportation projects. The ideal team being an integrated team similar to the structure used in places like England, New Zealand or Australia where private and public partner’s team up to jointly tackle the issues. The transition to a strategic network manager is already taking place at VDOT’s OTP3 office. In April 2012, VDOT selected industry experts to help guide their financial and management work. The follow firms were partnered with (VDOT 2012):

- For more information visit: http://www.virginiadot.org/newsroom/statewide/2012/industry_experts_selected_to57176.asp

Indications that a shift is taking place also include increased outsourcing of construction and maintenance via innovative delivery methods such as design-build and other public-private partnership contracts. The innovative contracting techniques at VDOT have changed the way risks are allocated among stakeholders. Project risks that were traditionally held by VDOT are now in trusted to the private sector (i.e., financing capital projects or operations management for maintenance). For example, traditional maintenance contracts were used by VDOT to maintain the interstate highways; however, the TAMS program has enabled VDOT to shift decision-making risks to the private sector. This approach has enabled VDOT to focus on higher-level action items such as auditing performance and strategically planning future projects.

VDOT should continue the current path of evolution, which increases outsourcing and emphasizes more strategic network management principles rather than traditional service providing. VDOT should apply the integration techniques used by the OTP3 office for activities at the Maintenance Division. VDOT can increase the effectiveness and rate at which the evolution takes place by mimicking other agencies that currently have integrated highway maintenance teams. The agencies studied in this research not only have strategic network philosophies for highway maintenance but they also have similar histories to how VDOT started highway maintenance. Linkages with other agencies provide evidence backing VDOT’s next step into a strategic network manager role for the Maintenance Division.

Western Australia and FDOT are two agencies with strong evolution connections to VDOT for strategic network management. These agencies offer best practices within asset management that could help VDOT become a more effective network manager of both roads and facilities.

Main Roads of Western Australia reached 100% outsourcing in 2000 with the release of their Term Network Contracts (TNC – corridor style contracts like TAMS). The Term Network Contracts for highway maintenance were not the only set of contracts helping Main Roads transform their agency from provider to network manager. Main Roads released four other styles of contracts contributing to the 100% outsourced milestone: the Traffic Control
Infrastructure Contract (TCIC), Term Asset Contracts Structures (TACS), Technical Engineering Services Contracts (TCC & TCCS) were all part of agencies plan to strategically manage and move away from direct provider of services. Prior to 2000, Main Roads had been downsizing their in-house resources since around 1980 and increasing the number of competitively tendered in an attempt to shed fixed resources (Barnsley 2012). In similar fashion, VDOT recently set downsizing agendas and has also increased outsourcing efforts to meet stringent deadlines. The difference between the two agencies is Western Australia has evolved past their corridor style contracts and onto newer area-wide style contracts with alliancing structure. Figure 52 displays the timeline comparison between VDOT and Main Roads.

VDOTs recent agendas for downsizing and delivering innovative projects supports the notion that VDOT is beginning to make similar contracting movements to that of Western Australia back in 2000 as well as 2012 with their ISA area-wide contracts. VDOT should continue to outsource more areas under their operations and maintenance program using similar techniques used by Main Roads. Techniques include performance-based maintenance contracts for structures and engineering services as well as adopting “Area-wide” maintenance practices where applicable.

The strongest connections between VDOT and Main Roads supporting a VDOT evolution aimed at greater outsourcing levels and strategic network management are:

- VDOT and Western Australia had their first performance-based contracts for roads around the same time (1997 & 1999); however, Main Roads unlike VDOT, continued outsourcing and consolidating contracts to improve efficiency. VDOT did not begin pushing for larger quantities of outsourcing and consolidating until the financial crisis hit in 2008 and the “Blueprint” was implementing in 2009. Now is the time for VDOT to consider new innovative approaches.
- VDOT’s recent Traffic Operations Center RFI issued by the OTP3 office mimics the Main Roads TCIC contract of 2000 for operations and maintenance of ITS assets.
Both Western Australia and even New Zealand have seen significant cost savings by outsourcing all maintenance works as well as other areas of business, which has enabled them to become a network manager (e.g., manager of engineering services and construction services). Figure 53 and Figure 54 display the cost savings for these two agencies that are fully outsourced and use the strategic network philosophy.

<table>
<thead>
<tr>
<th>COST SAVINGS FROM PBMCs IN AUSTRALIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jurisdiction(s)</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Regional Transport Authority, New South Wales; Tasmania; Western Australia</td>
</tr>
<tr>
<td>Sydney, New South Wales</td>
</tr>
<tr>
<td>Southern Tasmania</td>
</tr>
<tr>
<td>South Perth</td>
</tr>
<tr>
<td>Mid North Region</td>
</tr>
<tr>
<td>Six contracts in Western Australia</td>
</tr>
</tbody>
</table>

*Note: The base against which the cost savings are estimated is often not stated in the source.*

Figure 53 - Australia cost savings with PBMC (Hyman 2009)
Used with permission by TRB

<table>
<thead>
<tr>
<th>COST SAVINGS FROM PSMCs IN NEW ZEALAND</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract(s)</td>
</tr>
<tr>
<td>---------------------------------------</td>
</tr>
<tr>
<td>10-year, lump-sum, performance-specified maintenance contracts on part of the national road network and highway works throughout country; includes rehabilitation and maintenance</td>
</tr>
<tr>
<td>World Bank</td>
</tr>
<tr>
<td>Highway Maintenance Contracting</td>
</tr>
<tr>
<td>10-year, lump-sum, performance-specified maintenance contract (PSMC-001) covering 450 km</td>
</tr>
</tbody>
</table>

*Note: The base against which the cost savings are estimated is often not stated in the source.*

Figure 54 - New Zealand cost savings with PBMC (Hyman 2009)
Used with permission by TRB

FDOT’s contracting portfolio has also evolved towards a network manager role over the past 20 years. The role has shifted from a predominately in-house maintenance system to mostly outsourcing. After the introduction of “Asset Maintenance” contracts in 2000, FDOT began transitioning from traditional method-based contracts into newer performance-based contracts because of the cost saving benefits. Figure 55 displays FDOT’s evolving contract portfolio from 1994 through 2008.

Over the years, FDOT has reduced their in-house expenditures from 60% to 20% (light blue in figure 50). The charts indicate that performance-based maintenance contracting has gained a significant share of FDOT’s portfolio since inception. As of 2009, FDOT met their goal of 40% “Asset Maintenance” contracts, 40% Traditional and 20% in-house (Lattner 2011). Reducing in-house expenditures by 40% has enabled FDOT to control costs and downsize effectively while maintaining core competencies such as performance auditing and strategic planning infrastructure.
FDOT’s evolution from provider to strategic network manager has occurred quicker than VDOT; however, the VDOT shift appears to be taking shape in recent years after the “Blueprint” for downsizing.

Figure 55 - FDOT Maintenance Contracting Portfolio (Lattner 2011)
Used with permission by Mike Sprayberry

Figure 56 on the next page displays how the Asset Maintenance (AM) contracts (performance-based) have reached various types of assets in Florida not only interstates (i.e., limited access). Using the AM approach has enabled FDOT to downsize in numerous areas of maintenance including highway maintenance.

The results from Western Australia and New Zealand advocate VDOT moving towards a strategic network mindset as opposed to provider of maintenance services. The FDOT experience displays how VDOT could continue to downsize as mandated by the current VDOT “Blue Print”. Expanding the outsourcing portfolio like FDOT would help VDOT reach a wider range of assets as demonstrated by FDOT in Figure 56.
Figure 56 - FDOT AM contracts vs. Non-AM (Lattner 2011)
Used with permission by Mike Sprayberry
11.6.3 Recommendation #3 – Devise a “strategic network” of roads to help focus operations and maintenance efforts.

As the number of infrastructure assets increase so too must the resources that manage the upkeep. Growing levels of roadways and other assets coupled with smaller budgets have pushed agencies to downsize and invest in local government initiatives that devolve construction, operations and maintenance responsibilities. While researching and comparing agencies a theme emerged with regard to local government interactions. All foreign highway agencies studied had implemented some level of local government assistance or devolution program to help localities take on more asset management responsibilities. In some cases, local governments had even formed alliances and associations between each other to help facilitate and implement the local programs. Collaborating with localities has allowed agencies to allocate asset management responsibilities more effectively across the highway network. Using local government programs such as devolution enables highway agencies to better focus their attention on the most important corridors that serve statewide or countrywide significance.

England’s Highways Agency, Main Roads of Western Australia and New Zealand Transport Agency all had local government initiatives implemented at various points in their evolutions. Mapping these milestones to VDOT resulted in some strong connections. The strong connection with other agencies strengthens the current direction at VDOT including their current local government assistance programs. The evolutionary connections with devolution support a possible future implementation of a “strategic highway network” at VDOT, to divide road responsibilities between state forces and local governments.

The strongest connection found to support implementing a strategic network for maintenance is from the analysis between the VDOT and England timeline. In 1999, England’s Highways Agency implemented a “Detrunking” initiative to help the agency focus on a core set of trunk roads serving important transportation needs. The detrunking initiative in England is strongly connected to the 2001 “Devolution statute” passed in Virginia. The “Devolution statute” allows localities to assume responsibilities for secondary roadways previously under VDOT’s control. England’s “Detrunking” statute was mandatory compared to Virginia’s optional “Devolution statute”. Virginia’s devolution statute although different from England’s serves as an important evolutionary match because each agency was aiming to improve asset management services and prevent shortages in maintenance resources. Figure 57 displays a snapshot of the timeline comparisons completed between VDOT and Highways Agency. The black oval highlights the similar contracting milestones for devolution of roadways.

Since the detrunking effort in England, Highways Agency has successfully implement the “core” and “non-core” network philosophy allowing their transportation program to focus on developing and maintaining only the most vital infrastructure. The “Detrunking” efforts in England drove local governments to innovate leading to various procurement milestones in the local government arena:

- Birmingham & Portsmouth PFI’s – Both city councils have implemented PPP projects that include performance-based maintenance contracting on local roads. The scope includes:
  - All capital maintenance works for Portsmouth’s principal, secondary and tertiary networks;
  - routine and response maintenance of the network (including winter maintenance) and footpaths;
  - maintenance and management of bridges & other structures for the network;
  - maintenance and management of street lighting for the network; and
  - highway management and operations functions such as temporary traffic management and litter collection,
- Essex and Hampshire Councils – implemented performance-based maintenance contracts without the full PPP style project.
- Midlands Highways Alliance – collection of local governments teaming up to procure construction, maintenance and operations services by pool funds and gain guidance from the Highways Agency.
Main Roads of Western Australia and VDOT also have a connection stemming from the new Integrated Services Arrangements (ISAs). The new contracts (starting in 2012) at Main Roads will have service providers assisting local governments with asset maintenance on smaller roads. Assisting local governments with bridge and pavement marking maintenance are two important areas the integrated area team will conduct. The ISA and local government partnership connects to VDOT’s push to assist local governments beginning in early 2000’s with the creation of the Local Assistance Division. According to the Local Assistance Division website, VDOT surveys were recently administered (2011-2012) to counties regarding performance-based contracting appeal and secondary road assets. Localities responded about their comfort level with possibility using the new contract method. Local agencies also ranked various highway assets, which were of greatest importance. These surveys could be used by VDOT to choose which assets would benefit from a performance-based contract. Future TAMS contracts could include these critical assets such as bridges or roadside assets on secondary roads to help the localities. Learning from the TAMS contractors could help the localities learn and develop their own performance-based system. A TAMS contract with local road assistance would mimic the current best practices at Western Australia under their new ISA contract program.

Timeline comparison between VDOT and New Zealand Transport Agency yields numerous connections for procurement; however, one particular link closely resembles the VDOT “Devolution statute”. In 2002, The Local Government Act in New Zealand was passed dictating how local governments can assume power for certain activities on roadways. The act also promotes local government responsibilities for taking action with environmental, social and economic issues in local communities (New Zealand 2012). This milestone in NZTA history relates to not only the “devolution statute” in Virginia but also VDOT’s formation of the Local Assistance Division (LAD) in 2002. The LAD at VDOT helps local governments in a wide variety of manners such as funding,
transportation planning and even devolution. These key areas of assistance are directly linked to the Local Government Act in New Zealand. Both timeline milestones help establish a linkage which supports VDOT’s next step in creating a strategic network for maintenance. Using devolution strategies as seen in other nations could be a source of help for VDOT’s currently devolution barriers. Since the Local Government Act was passed in New Zealand, local governments have gone on to create their own construction, operations and even maintenance programs. The local governments have even procured performance-based maintenance contracts similar to localities in England after their detrunking mandate.

The major evolutionary difference between all others and VDOT is that other agencies appear to have progressed farther with local government programs and strategic network philosophies, which has enabled:

- A better focus on core network roadways helping allocate limited intangible and tangle agency resources.
- A clearer transition for localities taking control of smaller roads as well as helping assist localities in using innovative procurement techniques. Transportation agencies proceeded to use devolution as means to divvy up responsibilities between themselves and localities. This division of responsibilities helped focus operations and maintenance efforts on core roads.

Even though VDOT has not yet fully implemented a strategic network or fully devolved secondary roadways to localities there have been recent discussions to raise awareness. According to Professor Jonathon Gifford’s report on secondary road policy, there a still numerous procurement barriers and transportation planning issues impeding devolution of secondary roads (Gifford 2011). The recent discussions on effective allocation of resources and management responsibilities support the need for VDOT’s maintenance division to implement a strategic network for focusing efforts. The 2009 “Blueprint” for downsizing and 2011 secondary roads policy report from GMU are two examples of increased focus on creating a more effective road system in Virginia. VDOT’s emphasis on helping localities and using innovative funding schemes for projects are other areas supporting the next step for VDOT. In 2009, Gary Allen, PhD. at the Virginia Transportation Research Council (VTRC) put together a presentation on the possibility of a core network of roads in Virginia. VTRC’s discussion also supports this thesis recommendation and provides evidence that the next step for VDOT is soon approaching. The VTRC presentation lays out many points of interest including the need for a core network; potential agencies that could help identify core roads and potential benefits of using a core system. The presentation discusses Virginia’s current lack of a core network and highlights key characteristics of roads that should be considered (Allen 2009):

- Connects all parts of the state
- Connects all major public services, such as, fire, rescue, trauma centers, schools, prisons, ports, intermodal connections
- Core network would not be driven by jurisdictional boundaries
- Incorporates all functional classes
- Core system estimated to be 25,000 miles in Virginia

On the next page

Table 46 and Figure 58 display the make-up of a proposed core network in Virginia.
The biggest physical change with the core network would be the devolution of approximately 36,840 miles of secondary roads. The devolution of secondary roads is however, one of the biggest challenges facing VDOT and its Local Assistance Division. In addition to VTRC’s discussion of a core network, VTrans2035, a long-range transportation plan developed by the “Office of Intermodal Planning and Investment” discusses a strategic network of highways that they developed. VTrans2035 brings the following five agencies together to improve Virginia’s infrastructure and economy:

- Department of Aviation
- Department of Motor Vehicles
- Department of Rail and Public Transportation
- Virginia Port Authority
- Department of Transportation (VDOT)

Table 46 - GMU Report: Core Network Mileage (Gifford 2011)

<table>
<thead>
<tr>
<th>Core Network</th>
<th>Administrative Classification (current)</th>
<th>Change in Mileage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Miles</td>
<td>%</td>
</tr>
<tr>
<td>Interstate</td>
<td>1,120</td>
<td>5%</td>
</tr>
<tr>
<td>Interstate ramps</td>
<td>500</td>
<td>2%</td>
</tr>
<tr>
<td>Primary</td>
<td>7,920</td>
<td>32%</td>
</tr>
<tr>
<td>Secondary</td>
<td>11,440</td>
<td>47%</td>
</tr>
<tr>
<td>Urban</td>
<td>3,110</td>
<td>13%</td>
</tr>
<tr>
<td>Frontage</td>
<td>330</td>
<td>1%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>24,420</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>


Figure 58 - VTRC Identified Core Network for Virginia (Allen 2009)

Both used with permission by VDOT
The strategic network by the VTrans2035 plan is called the Corridors of Statewide Significance (CoSS). There are currently 11 corridors included in the CoSS (VTrans 2010):

- Southside Corridor – US 58
- Seminole Corridor – US 29
- Western Mountain Corridor – I-77
- Crescent Corridor – I-81
- Heartland Corridor – US-460
- Tidewater Corridor – US-17
- Eastern Shore Corridor – US-13
- East West Corridor – I-64
- Washington to North Carolina Corridor – I-95
- North Virginia Connector – I-66
- North Carolina to West Virginia Corridor – US-220

The studies completed by both Virginia Transportation Research Council and Office of Intermodal Planning and Investment support the future evolution of VDOT into a strategic core network philosophy for maintenance. Due to the challenges faced with secondary devolution, VDOT should investigate best practices of foreign agencies that have successfully completed devolution in order to create a strategic network. The connections made with Highway Agency, Main Roads of Western Australia and New Zealand all support VDOT’s next evolutionary step in transportation innovation. The next step will be VDOT’s successful integration of transportation operations and maintenance with a strategic core network of highways.

Figure 59 - VTrans2035 Corridors of Statewide Significant (VTrans 2010)

Used with permission by VDOT
As discussed in Chapter 6, Virginia procurement legislation plays a major role in VDOT’s ability to implement contracting programs. The following 3 pieces of Virginia Code pertain to road classifications and may be helpful at moving highway corridors around when devising a core network of roads:

- VA Code § 33.1-84.1. Resumption of responsibility for secondary highways by counties.
- VA Code § 33.1-52. Transfer of roads, etc., from secondary and primary systems to Interstate System.
- VA Code § 33.1-34. Transfer of roads, etc., from secondary to primary system; additions to primary system.

The corridors of statewide significance could be a possible starting point for VDOT and performance-based maintenance contracting. As discussed in recommendation number one, primary roads could be converted to performance-based contracts. The primary routes classified as CoSS routes could be the next area of expansion for performance-based highway maintenance. Currently the TAMS contracts already cover 100% of interstates, which are part of the CoSS routes.
11.6.4 Recommendation #4 – Shift focus of maintenance delivery from lowest cost to best value by integrating the team with a PPTA Pilot “TAMS-MAC”

The 1995 PPTA legislation in Virginia marked the beginning of new procurement avenues for VDOT. Up until the PPTA passing, VDOT had been procuring projects based upon set guidelines from the Virginia Public Procurement Act (VPPA – 1981). VPPA guidelines set out the standards for tendering professional services and non-professional services. Prior to 1995, VDOT was unable to procure non-professional services via Request for Proposals only lowest bid. VDOT was also unable to receive unsolicited proposals from private sector vendors. The PPTA changed the status quo by allow VDOT to procure unsolicited proposals as well as award projects based on “Best Value” principles. The best value process means awarding a contracts where price is considered as only one factor.

The PPTA was the key to Virginia’s first performance-based maintenance contract with VMS (1997 – 2007). The 10-year long, pilot contract was a different style of contract than the newer TAMS contracts for interstate maintenance (2007 – 2012). Both were performance-based maintenance contracts; however, the VMS pilot was tendered using an RFP process compared to the current TAMS, which uses a 2-step Invitation for Bid (IFB). Although the new 2-step process considers both price and technical proposal, price is the ultimate criteria for award. The technical proposal is opened first which determines if the contractor is qualified to perform the work. The price proposal is opened second, which determines the winning contractor based on lowest bid out of all qualified contractors. The pilot contract also had a different scope and payment scheme than current TAMS contracts. The pilot included capital works delivery such as major resurfacing and TAMS does not. Payments for service under the pilot contract were based on a schedule of predetermined values. The TAMS contracts have used equal lump sum payments as well as cost reimbursement based on value of work in place. VDOT’s maintenance program has moved from a “Best Value” approach under the pilot to essentially a “Lowest Cost” system. The move can be attributed to the 2006 mandate by the Virginia Assembly requiring all interstate maintenance to be performance-based maintenance and competitively bid (i.e., not a best value award).

Virginia’s current economic climate has shifted VDOT’s focus to a downsizing and cost saving environment that provides a climate for innovation. The VDOT focus should shift from a low bid strategy for maintenance to a value-for-money system also known as best value. The current status quo of “low-bid” maintenance delivery is understandable yet based upon the successful cost savings seen by agencies using the best value award system, VDOT should consider reverting changing back to an RFP method for maintenance. The RFP method would allow a mixed award system based on price and quality resembling the alliance style contract from England’s MAC (e.g., 80 price/ 20 quality).

The current climate at VDOT has led to modifications in the TAMS performance specifications and arguably for the worse because fewer assets are now being inspected. Using an alliance style approach like the Managing Agent contractor could help VDOT save money, downsize while not lowering performance standards. Mimicking a MAC contract in Virginia can deliver results if key MAC philosophies are put into place by VDOT. Philosophies such as alliancing and partnering as well as enacting stringent quality control methods used by Highways Agency.

While comparing the timelines of VDOT and other four agencies there were some major differences in contracting evolution. VDOT’s evolution progressed from a larger scope contract (i.e., VMS pilot) that was more outcome based (similar to England and Western Australia) towards a smaller scope with more method-based style specifications. Method style specifications are those, which the agency takes on the risk by dictating how the work is to be performed. Areas such as snow and ice removal and mowing services were two areas where VDOT stepped in for more control under TAMS (i.e., after the VMS pilot). The VDOT contracts for maintenance also continue to remain segregated between Owner, Service Provider and Performance Auditor.

In contrast, the Highways Agency, Main Roads of Western Australia and New Zealand have all increased the level of integration for maintenance services and they have maintained contractor involvement with capital works delivery. The recent economic downturn has shifted all agencies (including VDOT) to consider maintenance costs more carefully. VDOT’s focus on cost savings and downsizing aligns with other agencies like England and Western Australia who are currently modifying their contracts (2010 - 2012). The Highways Agency is moving from the
MAC contract to ASC, which balances the focus on maintenance costs and quality (Price 50/ Quality 50) compared to the older MAC (70/30). Main Roads of Western Australia moved their maintenance contracts from lump sum to cost-plus contracts in 2011 with the new ISA’s. The major difference between VDOT and the others is that international agencies have shifted to sharing risks through integrating and aligning objectives, which has helped save money. The use of innovative payment schemes compared to only using lump sum contracts has also led to industry improvements. VDOT has shifted in the opposite direction from the other agencies by moving risks back and forth between parties instead of working on integrating and sharing the risks.

The following contract spectrum shows the range of maintenance contracts that are seen in the industry.

![Contract Spectrum](image)

Figure 60 - OPUS Report: Maintenance contracting spectrum (Opus 2012)
Used with permission by Opus

VDOT was located more on the PBMC method in the pilot project contract with VMS and then shifted left, back to a traditional/hybrid style model (green area) with method and performance-based specifications. Essentially the agency wanted more control over areas where the contractor did not perform as expected. According to the OPUS report on performance-based maintenance contracting, the PSMC method although integrated and more outcome based, it leaves the agency/owner with less control over the desired outcomes. Other agencies such as Western Australia and England have cited the same “lack of control” as a reason behind switching to an Alliance method (i.e., shared risks). The timeline analysis showed that agencies are shifting right on the spectrum as opposed to left, which is what VDOT did. Based on the common desire (VDOT/other agencies) to retain control over the contractor and the need for cost savings, VDOT should follow the other agencies by shifting right, towards an Alliance approach that can help share risks and attain desired outcomes such as reduced crash rates and incident response times.

Figure 61 on the next page shows the current value chain for a TAMS contract compared to the integrated approach seen in England and other nations for highway maintenance. The TAMS value chain is segregated between roles as opposed to one cohesive unit for deliver services.
Table 47 - Opus Report: Contracting Spectrum Comparisons on the next page shows the delivery methods and how the Alliance style compares to the others. VDOT is located around the hybrid and traditional model while others are shifting towards the Alliancing model for shared risks and great control.
Table 47- Opus Report: Contracting Spectrum Comparisons (Opus 2012)
Used with permission by Opus

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Differentiator</th>
<th>Day Works</th>
<th>Traditional</th>
<th>Hybrid</th>
<th>PSMC/ PBC</th>
<th>Alliance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Time and materials rates - overheads</td>
<td>Combination of Measure and value and Lump Sum</td>
<td>Lump Sum (with some limited scheduled rates)</td>
<td>Lump Sum</td>
<td>Cost reimbursement with incentive scheme</td>
</tr>
<tr>
<td>Risk Transfer</td>
<td>RCA retains all</td>
<td></td>
<td>RCA retains majority</td>
<td>Majority of risk transferred</td>
<td>Risk transfer to supplier</td>
<td>Alliance retains all risk</td>
</tr>
<tr>
<td>Procurement Duration</td>
<td>Short</td>
<td>Short</td>
<td>Short</td>
<td>Short</td>
<td>Medium/ Long</td>
<td>Long</td>
</tr>
<tr>
<td>Contract Duration</td>
<td>No fixed term</td>
<td>3-5 years</td>
<td>5-7 years</td>
<td>10 years/ Evergreen</td>
<td>10 years /Evergreen</td>
<td></td>
</tr>
<tr>
<td>Type of Network</td>
<td>Rural, low traffic volumes, low risk and low innovation potential</td>
<td>Rural Semi-urban low risk and low innovation potential</td>
<td>Rural Semi-urban, High risk and high innovation potential</td>
<td>Rural Semi-urban high traffic volume, high risk, high innovation potential</td>
<td>Urban, high traffic volume, high risk, high innovation potential</td>
<td></td>
</tr>
<tr>
<td>Resources Consumed</td>
<td>Supplier selection method</td>
<td>Lowest price conforming</td>
<td>High weighting on price</td>
<td>High to medium weighting on price</td>
<td>High to medium weighting on price</td>
<td>Selected on quality non-price attributes</td>
</tr>
<tr>
<td></td>
<td>Procurement process cost and complexity</td>
<td>Low</td>
<td>Low</td>
<td>Medium</td>
<td>Medium to High</td>
<td>High</td>
</tr>
<tr>
<td></td>
<td>Flexibility to change</td>
<td>Very High</td>
<td>High</td>
<td>Medium to Low</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

| Functional Performance| Risk management opportunity     | Low, RCA retains risk         | Low, RCA retains risk         | Medium risk transfer to the Contractor     | High risk transfer to the Contractor | Retained by the alliance – best for project risk management |
|                       | Alignment of goals              | High                          | Low to Medium                 | Medium (dependent on specification)        | High                           |                               |
|                       | Whole-of-life focus             | Low                           | Medium                        | Medium to high                             | High                           |                               |
|                       | Level of Control                | High                          | High                          | Medium (Has defined KPM, OPM & MPM’s)      | High                           |                               |
|                       | Customer focus                  | Poor managed by RCA           | Moderate                      | Moderate                                    | Moderate                       | High                          |
|                       | Social and Environmental        | Low, RCA specific             | Low, RCA specific             | Low, RCA specific                           | Low to medium, RCA specific    | Excellent                     |
|                       | Principal drivers to be efficient and effective | As many inputs as possible, with no emphasis on efficiency | As many outputs as possible as efficiently as possible. No driver to be effective. | As little work as possible to deliver specified outcomes. Suppliers seek to be both effective and efficient | All parties seek to be both effective and efficient |                               |

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Connections between VDOT and the Highways Agency can be seen in Figure 62. The connections were mapped to understand where each agency has progressed in comparison to an integrated approach. The shift in cost savings focus occurs at the same time for both agencies around 2010-2011 leading to contract modifications. England moved to the new Asset Support Contract (ASC) in 2011 from the Managing Agent Contractor (MAC) program. VDOT moved from the version one of TAMS to the version two in 2010-2011. The red crosshairs represents the milestone where contract changes were being made at each agency. Prior to the common contract change point around 2011, the two agencies only had one other similar contracting milestone related to maintenance team integration. That common milestone was when each agency was procuring their first performance-based contract (yellow and black crosshairs).

Figure 62 - VDOT & HA contract integration evolutions

The first performance-based contract milestone points for each agency are similar because integration and capital works delivery were fundamental parts in both. Since then VDOT has traveled a different path then Highways Agency; however, current economic climates provide an opportunity to revamp TAMS to save costs and improve quality in the direction that England has gone with their alliance based format (MAC and ASC contracts).

Since the first performance-based contracts were tendered, the Highways Agency (HA) has continued to consolidate and integrate maintenance services. The increasing level of integration and alignment between parties is indicated in Figure 62 by the converging lines (red and black arrows straddling the Highways Agency timeline in purple). Since VDOT’s pilot contract, risk allocation has become more divided between agency and contractor and maintenance services have been taken out of the contracts as opposed to added. Previous TAMS assets maintained under performance-based style specifications have moved to a more method-based style allowing VDOT more control. The increasing level of non-integration can be seen in Figure 62 by the diverging lines straddling the VDOT timeline (Navy Blue).

The current economic climate in Virginia has shifted VDOT’s focus to one of downsizing and consolidation of services to eliminate duplication of responsibilities according to the VDOT “Blue Print”. The common contract point between VDOT and Highways Agency (2010-2012) provides an opportunity for VDOT to integrate services with private vendors and eliminate duplication of efforts using a MAC style contract, which uses aspects of both
traditional contracts and alliance contracts. Using the PPTA project route could enable VDOT to use an RFP process to solicit qualified consultant/contractor teams to perform services. The contract would hinge on shared risks between parties to help save costs. Saving costs through integration and outsourcing capital works in a single contract could help prevent VDOT from having to lower performance standards in future contracts.

The new style of TAMS contract could mimic the payment structure of the MAC system. Lump sum for routine works, target cost for improvements and reimbursements for emergencies. Including capital work improvements would help VDOT save on tendering costs of traditional contracts for major improvements such as resurfacing. Figure 63 depicts the MAC structure and could be used for a new integrated TAMS-MAC contract.

![The ‘MAC’ Model](image)

Figure 63 - MAC payment model (Sheppard 2011)

Integrating the team using a MAC approach has seen cost savings in many areas of the model as described by Halcrow Group. Halcrow Group is one of many engineering and construction firms involved with the MAC and ASC programs in England’s highway maintenance program.
<table>
<thead>
<tr>
<th>Aspect</th>
<th>Benefits</th>
<th>Significance / Value</th>
</tr>
</thead>
</table>
| Long Term Contracts    | • client/contractor (and supply chain) relationship focused joint outcomes.  
                          • reduced re-tendering costs — certainty, longer ROI and write downs  
                          • incentivized performance through contract extensions and future opportunities  
                          • longer term planning by contractors  
                          • better training and commitment of staff  
                          • competition maintained through advertisement | Medium  
                          Potential Savings: 5-10% |
| Removal of Duplication | • removing duplication of effort and improving cycle times  
                          • ‘quality management’ focuses the supplier to ensure ‘right first time’  
                          • incentive to remove duplication/wasted effort  
                          • roll up of contracts = less claims, legal costs and administration | High  
                          Potential Savings: 30%  
                          Move from M&V/MC  
                          arrangement to MAC has traditionally realised savings of circa 30% |
| Inclusion of Design Risk| • design / build advantages of speed of implementation  
                          • contractor knows the assets and the necessary work | Low  
                          Potential Savings: 0-5% |
| Increased Scope        | • incentive to take an holistic approach to managing the network  
                          • efficiency savings through better planning, co-ordination and control of work  
                          • savings through economies of scale (greater turnover, etc) | Low  
                          Potential Savings: 5% |

Figure 64 - Halcrow: MAC Concept Benefits (Clark 2010)  
Used with permission by Tom Clark
Interestingly the VDOT TAMS contract model fits into the MAC model according to the Halcrow material provided by Mr. Tom Clark. Figure 65 shows the additional scope areas in the MAC model, which add value-for-money.

Figure 65 - Halcrow: MAC Concept (Clark 2010)
Used with permission by Tom Clark
11.6.5 Recommendation #5 – Incorporate KPI’s into TAMS contracts to align stakeholder objectives.

An increasingly common trend among transportation agencies is the use of “Key Performance Indicators” or KPI’s for short. KPI’s are an added level of performance measurement to gauge overall project success in areas such as safety and environmental sustainability. Performance monitoring in a performance-based maintenance contract commonly use timeliness requirements to measure how fast a contactor can remediate defects and incidents on the roads. In addition to timeliness requirements there are performance standards that dictate measureable tolerances for assets such as grass and lighting (e.g., number of lights out per 1/10th mile segment). Adding KPI’s as an additional level of measurement has enabled agencies to align their business objectives with contractors to ensure value for money is attained. The KPI’s focus more on long-term performance as opposed to day-to-day performance, which covered by the standards and timelines requirements. As mentioned in recommendation four, the culture of lowest cost although effective tends to miss the wider organizational goal of delivering quality services to the traveling public. Using the KPI’s to align VDOT and their contractors could help the TAMS program display how their system is contributing to the overall VDOT organization.

The performance-based contracts of FDOT, Highways Agency, Western Australia and New Zealand have all evolved their maintenance contracts to include KPI’s. Figure 66 best illustrates the added layer of KPI’s to a performance-based maintenance contract. The current VDOT TAMS contracts regulate intervention levels through the timeliness requirements and levels of service on the various asset groups. The difference between TAMS and other agencies studied is the use of KPI’s to measure asset outcomes and especially community outcomes. Community outcomes are the major areas where KPI’s are focusing their efforts as seen within the MAC performance framework in England. England’s Highways Agency introduced eight Key Results Areas when launching the MAC contract in 2000. The addition of KPI’s in maintenance contracting has helped improve the safety and reliability on the trunk roads by aligning the focus of both owner and contractor.

![Figure 66 - OPUS Report Asset Maintenance Value Chain (Opus 2012)](image)

Since implementing the wide range of KPI’s in the MAC contract, England has been able to track and improve their network in areas such as safety (e.g., measured by KSI casualties) and journey time reliability (minutes per 10 miles on particular routes). The KSI information in Figure 67 was provided in Tom Clark’s MAC presentation at Halcrow Group. The graph shows the dramatic reduction in road casualties since implementing the Managing Agent Contractor program in 2000. The comprehensive MAC contract and KPI performance framework provides the contractor/consultant team with both incentive and disincentive payments depending on the outcomes achieved. Reducing the KSI level as seen in Figure 67 would allow the MAC contractor to gain positive incentives for achieving a desired “community outcome”.

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Not only has England incorporated and benefited from KPI’s but also so have the other agencies studied in this research. The Main Roads of Western Australia added KPI’s to their new Integrated Services Arrangement (ISA) contracts for an additional level of measurement and team integration. Prior to using KPI’s, Western Australia used Road Intervention Maintenance Parameters (RIMPS) to monitor asset upkeep. The added level of KPI’s in the new ISA procurement program allows the contractor/agent team to report safety and crash data among other areas of desired asset and community outcomes. Domestically, KPI’s are beginning to build momentum for maintenance contracts. For example, FDOT’s Asset Maintenance contracts have begun using KPI’s (in 2010) with their newly implemented AMPER quality assessment. The assessment rates contractor quality in areas such as number of change orders, customer relations and quality control. Contractor performance on the AMPER assessment will be used in future procurement evaluations to ensure FDOT and the public is gaining the best value possible with the chosen contractor.

The evolution of contractor performance measurement at the other agencies can be connected to VDOT’s recent change in the TAMS contracts (e.g., 2010-2011). The new TAMS, beginning with I-64 Culpeper TAMS, have modifications on performance standards to save costs associated with inspections by auditors. The new TAMS (Version #2) contracts are assessing contractors based on asset group scores compared to each asset item in the older TAMS (Version #1) contracts. The recent change offers an opportunity to take a second look into how VDOT TAMS contractors should be monitored. In the past, the other agencies have all had measures for timelines requirements and asset level of service outcomes just like the VDOT TAMS contracts. The other agencies unlike VDOT evolved a step further into using KPI’s and have all seen positive impacts on cost savings and community outcomes such as safety and reliability. VDOT should consider reworking the contracts into a version #3 that uses KPI’s.
Based on the timeline analysis conducted between VDOT and FDOT, the recent evolution of contracts at VDOT, Version #1 to Version #2, resembles the current FDOT Asset Maintenance (AM) contracts. The AM contracts rate performance on a higher-level such as asset group as opposed to each asset item similar to VDOT TAMS Version #2. FDOT went a step further than VDOT by using their newly formulated AMPER program to ensure quality through KPI’s. VDOT should consider mimicking FDOT and other agencies by evolving into a KPI based system that will help support the current TAMS monitoring system. Incorporating KPI’s in TAMS could help benchmark, monitor and improve the level of value delivered to the public and while still saving money. All four agencies studied in the timeline analysis incorporated KPI’s and realized performance gains as well as substantial cost savings. The following cost savings in Figure 68 were reported in the NCHRP report for agencies using performance-based maintenance compared to conventional contracts. Other international agencies not studied in this research are included in the figure and have seen substantial savings by incorporating KPI’s into their maintenance program (e.g., Finland, Canada, etc.):

![Figure 68 - NCHRP Cost Savings with Performance-based maintenance (Hyman 2009)](Used with permission by TRB)

Currently, VDOT has a performance dashboard for the entire organization on their website. The maintenance division should consider piloting a mini-maintenance level dashboard for monitoring their 13 statewide TAMS contracts. The dashboard could include performance-based maintenance KPI’s such as safety, journey reliability and sustainability similar to those used in places like England (i.e., MAC). Using a maintenance level dashboard could help create a culture of continuous improvement among agency staff and contractors within the maintenance division. The culture would continually push to improve their yearly KPI levels. The use of a dashboard could also help secure additional funding for the TAMS program by showing upper management and lawmakers how TAMS
contractors contribute to welfare of the travel public. The current “VDOT Dashboard” at the agencies main website could serve as a starting point for devising and implementing KPI’s on TAMS contracts. Figure 69, Figure 70 and Figure 71 display current snapshots of the VDOT dashboard.

Figure 69 - VDOT Dashboard: Safety (Sorrell 2011)
Used with permission by VDOT

Figure 70 - VDOT Dashboard: Highway Performance (Sorrell 2011)
Used with permission by VDOT
Reflections and Future Research

12.1 Research Process Challenges

Over the course of the research process, there were many challenges with collecting and analyzing data. The major challenge in collecting information was the lack of substantial cost evidence to back performance-based contracting. The costs were often compared to in-house forces performing the same work in a particular location. The major issue with this style of comparison is the varying cost methods used by public and private sector entities (Hyman 2009). The NCHRP reports cost savings for implementing PBMC but does not mention the cost savings after the performance-based program had been in operation for a few years. It would be helpful to know if costs were estimated correctly and whether unexpected issues arose leading to new improvements in the performance-based maintenance system.

Information on performance-based contract results were often hard to attain because three major issues:

- The lack of standard reporting procedures to differentiate performance-based contract results from non-performance-based. For example, while discussing performance-based contracts with TxDOT staff they informed me that level of service data on their TxDOT dashboard does not differentiate LOS between each style of contract. It would be beneficial to know how LOS numbers vary from contract to contract. In addition, it would be interesting to see how LOS and costs have changed since implementing the contract on a road after implementing performance-based maintenance.

- The programs for performance-based maintenance are new for places such as Western Australia. The new Integrated Services Arrangements are just beginning in 2012 and 2013 and will not have performance evaluations until around 2015. Only then will Western Australia determine where the new model is paying dividends compared to the older TNC’s. Information on the older Term Network Contracts was mixed with
good and bad results. The improvements recommended by the Auditor General office in Western Australia helped Main Roads formulate the new Alliance style contracts which allows the agency more control over outcomes compared to a pure performance-based maintenance contract (PBMC) model where all decision making ability and control lies with the contractor/consultant team.

- A reluctance to share information, possibly because the information may show the agency or contractors in a “not so favorable” light. Some data on performance is sensitive and was not able to be obtained for this project.

Another major challenge was gathering information from VDOT maintenance staff due to their busy schedules. Meeting with a panel of experts to discuss the VDOT timeline was a desired objective that never happened. It would have been insightful to learn about why particular decisions were made in the TAMS contracts as well as the initial pilot project contract. I would be helpful to learn why capital works were scrapped from future contracts after the pilot and what lessons were learned. Learning from the first contract and other TAMS could help guide the direction for an integrated contract that meets VDOT’s current needs. In addition, learning about how the TAMS contracts are funded could enable better future recommendations for VDOT’s next step.

Collection information on VDOT regarding capital works delivery could help build the case for a future TAMS-MAC model. Analyzing interstate maintenance data to determine where the majority of resurfacing and roadway improvements take place could help locate a potential pilot project location for the MAC model. Using a MAC system in which the contractor/consultant team helps plan future improve works (up to certain threshold), may help VDOT cut down on the contract administration costs inherent with procuring frequent road renewals.

12.2 Public Policy and Procurement Laws

The major roadblock for implementation of performance-based best practices is the procurement climate in Virginia. A detailed public policy analysis would have to be completed to fully determine the feasibility of using performance-based contracts on the state transportation system from a new alliance contract method or area-wide format performance-based contract.

Another area of policy concern and privatization is public sector job loss. Implementing higher levels of the performance contracts would mean fewer jobs for in-house maintenance staff. This issue was mentioned in a Main Roads presentation by Robert Barnsley in Western Australia. The new ISA contracts by Main Roads have considered the relocation of existing staff from implementing the area-wide format contract. Learning from Main Roads on how to deal with a changing organizational structure may help VDOT maneuver the downsizing initiatives enacted by the VDOT “Blue Print”.

12.3 2012 US Transportation Bill – MAP 21

The July 17, 2012 enactment of MAP-21, Moving Ahead for Progress in the 21st Century has changed the structure of the transportation system from the older SAFETEA-LU bill. The bill will last until 2014 and will restructure many government programs to allow more flexibility for project delivery. There is apparently more emphasis on innovative project delivery (P3’s) and performance measurement/reporting. The feasibility of an alliance model under this new system could be explored for assisting VDOT in implementing a potential “TAMS-MAC” for integrated maintenance services. Interestingly the new program will require additional highways to be included in the National Highway System creating a great demand on operations and maintenance resources. This may provide VDOT an opportunity to use larger format area-wide contracts similar to Australia or England. Figure 72 dictates the final restructuring of the MAP-21 program. For more information visit Transportation for America and see their new guide to navigating the legislation called, “Handbook: Making the Most of MAP-21”.

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Appendix A

Supplemental Documents

Exhibits A.1 thru A.4
Exhibit A.1  
Contract Matrix by Finnish Road Administration

This matrix was made by Pekka A. Pakkala of the Finnish Road Administration to compare side-by-side different international highway agencies (includes US DOT’s).

Reference:


Used with permission by Pakkala
<table>
<thead>
<tr>
<th>IN-HOUSE</th>
<th>OUT-SOURCED</th>
<th>ACTIVITIES INCLUDED</th>
<th>CONTRACT TYPE</th>
<th>CONTRACT DURATION</th>
<th>CONTRACTOR SELECTION CRITERIA</th>
<th>AREA OR CORRIDOR CONTRACTS</th>
<th>QUOTED SAVINGS</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta, Canada</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Unit Hybrid</td>
<td>5, 6 &amp; 7 Years</td>
<td>95% Price *5% Past Performance</td>
<td>30 Areas</td>
<td>25%</td>
<td>Winter Maintenance Standby receives about 35% Lump Sum Payment</td>
</tr>
<tr>
<td>British Columbia, Canada</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Lump Sum</td>
<td>10 Years</td>
<td>60% Price *40% Other</td>
<td>28 Areas</td>
<td>10%</td>
<td>Line Marking &amp; Lighting are not included. A single contractor can only win 4 area contracts</td>
</tr>
<tr>
<td>Ontario, Canada</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Hybrid (Lump Sum &amp; Unit Prices)</td>
<td>7-9 Years</td>
<td>95% Price *5% Other</td>
<td>48 Areas</td>
<td>12%</td>
<td>16 Performance-Based Area Contracts Remainder – &quot;Maintenance Outsourced&quot; by the &quot;Salesman Model&quot;</td>
</tr>
<tr>
<td>Estonia</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Hybrid</td>
<td>5 Years New–7 Years</td>
<td>75% Price *25% Other</td>
<td>16 Areas</td>
<td>Up to 20%</td>
<td>Own In-house forces compete against private contractors. 63% of Maintenance is tendered</td>
</tr>
<tr>
<td>Norway</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Hybrid</td>
<td>4 Years</td>
<td>Lowest Price Conforming Tender</td>
<td>107 Areas</td>
<td>20-30%</td>
<td>Client maintains most inspection</td>
</tr>
<tr>
<td>Sweden</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Hybrid</td>
<td>3-6 Years</td>
<td>96% Price *3% Other</td>
<td>136 Areas</td>
<td>20-30%</td>
<td>New Winter Maintenance Payment Scheme based upon actual weather conditions</td>
</tr>
<tr>
<td>Finland</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Hybrid &amp; Lump Sum</td>
<td>3, 5 &amp; 7 Years</td>
<td>75% Price *25% Other</td>
<td>85 Areas</td>
<td>Over 30%</td>
<td>Now separate contracts for line marking, resurfacing, &amp; bridges are Long-term duration</td>
</tr>
<tr>
<td>Holland</td>
<td>X</td>
<td>Different Activities</td>
<td>Lump Sum</td>
<td>1-3 Years</td>
<td>100% Price</td>
<td>Many Areas</td>
<td>30-40%</td>
<td>Future – Investigating MAC model from England and will adapt to Holland Situation</td>
</tr>
<tr>
<td>Australia (VIC-Roads)</td>
<td>X</td>
<td>Routine Maintenance</td>
<td>Lump Sum</td>
<td>2-3 +1+1 Years</td>
<td>100% Price</td>
<td>About 50% of Network</td>
<td>Some</td>
<td>Competition between In-House Forces and Private Sector. Still quite input based.</td>
</tr>
<tr>
<td>Australia Western, Australia</td>
<td>X</td>
<td>Basically All</td>
<td>Lump Sum</td>
<td>10 Years</td>
<td>50% Price *50% Other</td>
<td>8 Areas</td>
<td>20%</td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>X</td>
<td>Basically All</td>
<td>Lump Sum (Unit Price For Undefined)</td>
<td>5 + 2 Years</td>
<td>25% Price *75% Other</td>
<td>E-MAC is 100% Quality (Target Price)</td>
<td>14 Areas</td>
<td>Over 10%</td>
</tr>
<tr>
<td>New Zealand</td>
<td>X</td>
<td>Routine Routine Plus ALL</td>
<td>Unit Price Hybrid Lump Sum</td>
<td>3+1 Years 3+1+1+10 Years</td>
<td>Low Bid Weighted Avg. QPTO</td>
<td>24 Areas</td>
<td>10-15%</td>
<td>Still using about 50% Traditional Maintenance Contracts. Very small staff.</td>
</tr>
<tr>
<td>USA (NCDOT)</td>
<td>X</td>
<td>Activity Based</td>
<td>Unit Price</td>
<td>1 Year</td>
<td>100% Price</td>
<td>Corridor</td>
<td>Unknown</td>
<td>Outsource those activities that are more efficiently done by contractor or balancing work</td>
</tr>
<tr>
<td>USA (MDSHA)</td>
<td>X</td>
<td>Activity Based</td>
<td>Unit Price</td>
<td>1 Year</td>
<td>100% Price</td>
<td>Corridor</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>USA (MNDOT)</td>
<td>X</td>
<td>Activity Based</td>
<td>Unit Price</td>
<td>1 Year</td>
<td>100% Price</td>
<td>Corridor</td>
<td>Unknown</td>
<td></td>
</tr>
<tr>
<td>USA (DDOT)</td>
<td>X</td>
<td>Basically All</td>
<td>Lump Sum</td>
<td>5 Years</td>
<td>50% Price *50% Other</td>
<td>Corridor</td>
<td>Unknown</td>
<td>Does not include major bridge rehabilitation</td>
</tr>
<tr>
<td>USA (VDOT)</td>
<td>X</td>
<td>Basically All Proposed</td>
<td>Lump Sum (New)</td>
<td>3+3+3</td>
<td>50% Price -50% Other *100% Price</td>
<td>Corridor</td>
<td>10-15%</td>
<td>Still basically in-house. Only 1 integrated contract (VMS). New contracts planned for routine maintenance 3+3+3 years, with low bid</td>
</tr>
<tr>
<td>USA (FDOT)</td>
<td>X (about 20%)</td>
<td>40% Routine Maintenance 40% Salesman</td>
<td>Lump Sum</td>
<td>7+7 Years Yearly</td>
<td>40% Price *60% Other *100% Price</td>
<td>Corridor</td>
<td>20%</td>
<td>Goal is to Achieve 80% Outsourced. Using a Maintenance Rating Program (MRP) to measure performance. 10 Year Rest Area Contract</td>
</tr>
</tbody>
</table>

Table 12 Summary of Maintenance Contracts
Exhibit A.2

Contract “Family Tree” by Cindy L. Menches

This “Family Tree” of contract methods was made by Cindy L. Menches of the Center for Transportation at the University of Texas at Austin. The tree helps to classify 13 different contracting methods used throughout the performance-based maintenance contracting industry.

Reference:

Menches, C., L. et al. (2010). "Synthesis Study on Innovative Contract Techniques for Routine and Preventive Maintenance Contracts," 0-6388-P1, Center for Transportation Research at The University of Texas at Austin, Austin, TX.

Used with permission by Menches
Figure 2.3: Diagram of the 13 Innovative Maintenance Delivery Methods
Exhibit A.3

Decision Matrix by Cindy L. Menches

This matrix was made by Cindy L. Menches of the Center for Transportation at the University of Texas at Austin. The matrix helps agencies choose the right contracting method depending on their needs and experiences.

Reference:

Menches, C., L. et al. (2010). "Synthesis Study on Innovative Contract Techniques for Routine and Preventive Maintenance Contracts," 0-6388-P1, Center for Transportation Research at The University of Texas at Austin, Austin, TX.

Used with permission by Menches
Figure 3.1: Maintenance Contracting Strategy Selection Framework
Exhibit A.4

O&M KPI’s used by various highway agencies

This exhibit was taken from the 2011 KPI report by FHWA. The exhibit presents operations and maintenance KPI’s which have proven beneficial for asset management.

Reference:

Used with permission by Mike Garvin - Committee Member at Virginia Tech
Every public-private partnership (PPP) contract analyzed in this study implemented a performance measurement system. In the performance management system, performance measures are used to assess the progress and effectiveness of the concessionaire in meeting contract requirements. Some of these contracts contained specific sections with tables of key performance indicators (KPIs) attached to each measure to be used as a performance marker for that measure. Generally, these indicators include elements such as percentages, ratios, indexes, and condition states to verify if and when the concessionaire has met the required performance standards. These measures and indicators exist for a variety of project elements, including safety, environmental stewardship, design, construction, operations, and maintenance, but the focus here is on operations and maintenance KPIs. Some common examples in this category include pavement condition, incident response time, and tollway inspection ratings.

KPIs are only the tip of a much larger pyramid consisting of performance mechanisms such as quality management plans, audits, inspections, and independent verifiers. However, it is important to understand how these specific mechanisms work because they set the benchmarks the audits, inspections, and verifiers use for comparison and assessment.

This appendix contains tables of KPIs found in the PPP agreements. It is important to note that specific measures and indicators were extracted from the contract language to create each table. These tables are not a complete set of the measures and indicators for the contracts, but reveal details of a few, hand-selected measures and indicators. However, a complete list of the measures and indicators in the contract is provided for reference.
### TABLE 31. I-595 categories for operations and maintenance performance measurement.

<table>
<thead>
<tr>
<th>Operations and Maintenance Requirements (Construction Period)</th>
<th>Operations and Maintenance Requirements (Operating Period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Incident response</td>
<td>• Maintenance rating performance</td>
</tr>
<tr>
<td>• Fuel spill and contamination</td>
<td>• Flexible pavement</td>
</tr>
<tr>
<td>• Mowing, litter removal, road and bridge sweeping, reworking of shoulders, slopes, and roadside ditches</td>
<td>• Rigid pavement</td>
</tr>
<tr>
<td>• Flexible pavement</td>
<td>• Fuel spills and contamination</td>
</tr>
<tr>
<td>• Raised pavement markers</td>
<td>• Guardrail</td>
</tr>
<tr>
<td>• Pavement markings</td>
<td>• Attenuators</td>
</tr>
<tr>
<td>• Pavement symbols</td>
<td>• Fence</td>
</tr>
<tr>
<td>• Guardrail</td>
<td>• Signs</td>
</tr>
<tr>
<td>• Attenuators</td>
<td>• Drainage systems</td>
</tr>
<tr>
<td>• Signs</td>
<td>• NPDES</td>
</tr>
<tr>
<td>• Drainage systems</td>
<td>• Concrete sidewalk inspection</td>
</tr>
<tr>
<td>• National Pollutant Discharge Elimination System (NPDES)</td>
<td>• Barrier wall</td>
</tr>
<tr>
<td>• Lighting</td>
<td>• Toll gantry system inspection</td>
</tr>
<tr>
<td>• Bridges and bridge maintenance</td>
<td>• Toll equipment building and ITS hubs</td>
</tr>
<tr>
<td>• Mast arm structure</td>
<td>• Clear zone obstructions</td>
</tr>
<tr>
<td>• Overlane sign structure</td>
<td>• Highway lighting</td>
</tr>
<tr>
<td>• High mast light poles</td>
<td>• Navigation lighting</td>
</tr>
<tr>
<td>• Fence</td>
<td>• Mast arm structure</td>
</tr>
<tr>
<td>• Concrete sidewalk</td>
<td>• Overlane sign structure</td>
</tr>
<tr>
<td>• Graffiti</td>
<td>• High mast light poles</td>
</tr>
<tr>
<td>• Intelligent transportation systems (ITS) operations</td>
<td>• Bridges</td>
</tr>
<tr>
<td>• Deliverables</td>
<td>• Bridge maintenance</td>
</tr>
<tr>
<td>• ITS maintenance services</td>
<td>• Painting steel structures</td>
</tr>
<tr>
<td>• Backbone fiber network</td>
<td>• Graffiti</td>
</tr>
<tr>
<td>• ITS reliability</td>
<td>• Pressure cleaning concrete surfaces</td>
</tr>
<tr>
<td>• Transportation management center (TMC) operations</td>
<td>• Vegetation control on concrete slopes and surfaces</td>
</tr>
<tr>
<td>• Severe incident response vehicle operations</td>
<td>• Landscape areas</td>
</tr>
<tr>
<td>• Road Ranger operations</td>
<td>• Chemical vegetation control</td>
</tr>
<tr>
<td></td>
<td>• Fertilizer</td>
</tr>
<tr>
<td></td>
<td>• Sound barriers</td>
</tr>
<tr>
<td></td>
<td>• Roadway characteristics inventory</td>
</tr>
<tr>
<td></td>
<td>• Customer service staff</td>
</tr>
<tr>
<td></td>
<td>• ITS operations</td>
</tr>
<tr>
<td></td>
<td>• TMC operations</td>
</tr>
<tr>
<td></td>
<td>• Emergency access gates</td>
</tr>
<tr>
<td></td>
<td>• Deliverables</td>
</tr>
<tr>
<td></td>
<td>• ITS maintenance services</td>
</tr>
<tr>
<td></td>
<td>• Backbone fiber network</td>
</tr>
<tr>
<td></td>
<td>• ITS reliability</td>
</tr>
<tr>
<td></td>
<td>• TMC operations</td>
</tr>
<tr>
<td></td>
<td>• Traffic incident management operations</td>
</tr>
<tr>
<td></td>
<td>• Road Ranger operations</td>
</tr>
<tr>
<td>Asset Preservation Performance Measures</td>
<td>Highway Running Surfaces</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Paved traffic lanes</td>
<td>Component condition</td>
</tr>
<tr>
<td>Paved medians</td>
<td>Structure condition</td>
</tr>
<tr>
<td>Paved pullouts, rest stop areas, side roads, and ramps</td>
<td>Network condition: retaining walls</td>
</tr>
<tr>
<td></td>
<td>Network components: major signs</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Appendix C: Example Summary Operations and Maintenance KPI Tables

**TABLE 33. I-595 corridor improvements example operations and maintenance KPIs.**

<table>
<thead>
<tr>
<th>Element Category</th>
<th>Required Task</th>
<th>Minimum Performance Requirements</th>
<th>O&amp;M Violation Classification</th>
<th>Cure Period</th>
<th>Interval of Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Maintenance Performance Rating (MRP)</td>
<td>Conduct a monthly MRP cycle in accordance with the FDOT MRP Handbook.</td>
<td>Meet a minimum quarterly overall MRP rating as required in FDOT Procedure No. 850-000-015—Roadway and Roadside Maintenance.</td>
<td>D</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meet a minimum quarterly rating as required in FDOT Procedure No. 850-000-015—Roadway and Roadside Maintenance for individual elements.</td>
<td>C</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Meet a minimum quarterly rating as required in FDOT Procedure No. 850-000-015—Roadway and Roadside Maintenance for individual characteristics.</td>
<td>B</td>
<td>0</td>
<td>N/A</td>
</tr>
<tr>
<td>Highway Running Surfaces: Pavement</td>
<td>Maintain flexible pavement at acceptable level of safety for traveling public.</td>
<td>Meet the performance requirements in Division II, Section 6 of the technical requirements for the following:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Category 1 Pavement (0–3 years after substantial completion)</td>
<td></td>
<td>• Rutting to be maintained less than a depth of 0.25 in</td>
<td>B</td>
<td>90 days</td>
<td>Every 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Ride to be maintained at RN greater than 3.5</td>
<td>B</td>
<td>90 days</td>
<td>Every 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Settlement/depression maximum depth of 0.5 in</td>
<td>B</td>
<td>7 days</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Cumulative length of cracking &gt;30 ft for cracks &gt; 0.125 in a 0.1-mi lot</td>
<td>B</td>
<td>90 days</td>
<td>Every 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Raveling and/or delamination of the friction course as defined and determined by the department in accordance with the examples at <a href="http://www.dot.state.fl.us/specificationsoffice/pavement.htm">www.dot.state.fl.us/specificationsoffice/pavement.htm</a> or its successor</td>
<td>C</td>
<td>90 days</td>
<td>Every 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Potholes and slippage areas cannot be greater than 0.5 square feet in area and 1.5 in deep</td>
<td>C</td>
<td>24 hours</td>
<td>Hourly</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Bleeding as defined and determined by the department in accordance with the examples at <a href="http://www.dot.state.fl.us/specificationsoffice/pavement.htm">www.dot.state.fl.us/specificationsoffice/pavement.htm</a> or its successor</td>
<td>B</td>
<td>90 days</td>
<td>Every 5 days</td>
</tr>
<tr>
<td>Guardrail</td>
<td>Maintain guardrail at acceptable level of safety for the traveling public.</td>
<td>Meet the performance requirements in FDOT Design Standards, Section 536 of Standard Specifications for Road and Bridge Construction, Standard Maintenance Special Provisions—ME536 or per the concessionaire’s design criteria.</td>
<td>B</td>
<td>3 days</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Inspect the guardrail system.</td>
<td>Complete the inspection in accordance with FDOT Procedure 850-050-003 or its successor.</td>
<td>A</td>
<td>0</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Complete repairs identified in the inspection report.</td>
<td></td>
<td>B</td>
<td>30 days</td>
<td>Daily</td>
</tr>
</tbody>
</table>
### Signs

<table>
<thead>
<tr>
<th>Overlane Sign Structure</th>
<th>Maintain overlane sign structures at acceptable level of safety for traveling public.</th>
<th>Meet the performance requirements set forth in the FDOT Design Standards and the Standard Specifications for Road and Bridge Construction or per the concessionaire's design criteria.</th>
<th>B</th>
<th>7 days</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Perform overlane sign structure inspection.</td>
<td>Complete the inspection in accordance with FDOT Procedure 850-010-030 or its successor.</td>
<td>A</td>
<td>0</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Complete repairs identified in the inspection report.</td>
<td></td>
<td>B</td>
<td>30 days</td>
<td>Daily</td>
</tr>
</tbody>
</table>

### Toll System

<table>
<thead>
<tr>
<th>Toll Gantry System Inspection</th>
<th>Maintain toll gantry at acceptable level of safety for the traveling public.</th>
<th>Meet the performance requirements in the concessionaire's design criteria.</th>
<th>B</th>
<th>5 days</th>
<th>Daily</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Inspect toll gantry system.</td>
<td>Complete the inspection in accordance with FDOT Procedure 850-010-030 or its successor.</td>
<td>A</td>
<td>0</td>
<td>Daily</td>
</tr>
<tr>
<td></td>
<td>Complete repairs identified in the inspection report.</td>
<td></td>
<td>B</td>
<td>30 days</td>
<td>Daily</td>
</tr>
</tbody>
</table>

### Bridges

<table>
<thead>
<tr>
<th>Bridge Maintenance</th>
<th>Perform repairs generated from bridge inspections.</th>
<th>Routine: Complete repairs required to maintain an existing level of performance and to prevent additional deterioration or extend the service life of the structure.</th>
<th>B</th>
<th>180 days</th>
<th>Every 10 days</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Urgent: Complete repairs required to correct deficiencies or defects to protect the integrity of the structure or maintain a desired level of performance.</td>
<td>C</td>
<td>90 days</td>
<td>Every 5 days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Emergency: Repairs must begin immediately to repair critical damage on the structure and to insure the safety of the traveling public. Work is initiated immediately and work shall be completed as soon as possible.</td>
<td>E</td>
<td>30 days</td>
<td>Daily</td>
</tr>
</tbody>
</table>

(continued)
### Appendix C: Example Summary Operations and Maintenance KPI Tables

#### (Table 33 continued)

<table>
<thead>
<tr>
<th>Element Category</th>
<th>Required Task</th>
<th>Minimum Performance Requirements</th>
<th>O&amp;M Violation Classification</th>
<th>Cure Period</th>
<th>Interval of Recurrence</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intelligent Transportation Systems</strong></td>
<td><strong>ITS Operations</strong></td>
<td>Monitor time required for roadway clearance.</td>
<td>I-595 express lanes quarterly average roadway clearance duration (in minutes) must be no more than 90% of FDOT District Four’s ITS performance measures published quarterly on <a href="http://www.smartsunguide.com">www.smartsunguide.com</a>.</td>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor time required for incident clearance.</td>
<td>I-595 express lanes quarterly average incident and event clearance duration (in minutes) must be no more than 90% of FDOT District Four’s ITS performance measures published quarterly on <a href="http://www.smartsunguide.com">www.smartsunguide.com</a>.</td>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor time required for roadway clearance.</td>
<td>I-595 general-purpose lanes quarterly average roadway clearance duration (in minutes) must be no more than that of FDOT District Four’s ITS performance measures published monthly on <a href="http://www.smartsunguide.com">www.smartsunguide.com</a>.</td>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Monitor time required for incident clearance.</td>
<td>I-595 general-purpose lanes quarterly average incident and event clearance duration (in minutes) must be no more than that of FDOT District Four’s ITS performance measures published monthly on <a href="http://www.smartsunguide.com">www.smartsunguide.com</a>.</td>
<td>B</td>
<td>0</td>
</tr>
<tr>
<td><strong>Lane Closures and Blockages</strong></td>
<td><strong>TMC Operations</strong></td>
<td>Maintain real-time data and video transfer to the department.</td>
<td>Provide real-time access to all video and data in the project limits.</td>
<td>A</td>
<td>1 Hour</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Notify SMART SunGuide TMC of Lane and road closures.</td>
<td>Notify the SMART SunGuide TMC of lane and road closures in the O&amp;M project limits within 5 minutes of confirmation.</td>
<td>A</td>
<td>5 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Post DMS and HAR</td>
<td>Post DMS and HAR within 3 minutes of confirmed lane blockage or road closure.</td>
<td>A</td>
<td>3 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Populate 511 ATIS system.</td>
<td>Send information to populate 511 ATIS system with lane blockage and road closure information within 3 minutes of confirmation.</td>
<td>A</td>
<td>3 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Maintain minimum CCTV camera detection rate.</td>
<td>Meet a minimum CCTV camera detection rate of 30%.</td>
<td>A</td>
<td>0</td>
</tr>
<tr>
<td><strong>Incident Response</strong></td>
<td><strong>TIM Operations</strong></td>
<td>SIRV operator must respond to an incident or emergency.</td>
<td>SIRV is required to respond in 15 minutes upon notification.</td>
<td>D</td>
<td>15 minutes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>SIRV team incident reports must be submitted to the department by the 5th working day each month.</td>
<td>Provide summary of SIRV-related activities, including but not limited to number of events responded to, number of meetings attended, agency time savings, and list of equipment used.</td>
<td>A</td>
<td>0</td>
</tr>
</tbody>
</table>
### TABLE 34. Golden Ears Bridge/Kicking Horse Canyon Phase II example asset preservation performance measures.

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Intervention Criteria: KPI</th>
<th>Action</th>
<th>Maximum Response Time</th>
<th>Basis of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Highway Running Surfaces: Pavement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Paved Traffic Lanes—Roughness</td>
<td>Where roughness exceeds an IRI (International Roughness Index) value of 2.5 over any 50-m length of traffic lane, excluding concrete bridge deck wearing surface, but including abutments</td>
<td>1. Confirm that high-speed data reflect actual site conditions. 2. Where roughness is confirmed, undertake physical works to address noncompliance.</td>
<td>12 months</td>
<td>Longitudinal profile roughness measurements, expressed as IRI, collected for each wheel path as per ministry survey specifications and averaged</td>
</tr>
<tr>
<td>Paved Traffic Lanes—Surface Deterioration</td>
<td>Where pavement surface deterioration over any traffic lane exceeds the limits shown in the Concession Local Area Specification—Cumulative Distribution Curve for PDI</td>
<td>Undertake physical works to address noncompliance.</td>
<td>12 months</td>
<td>Pavement surface distress ratings performed in accordance with the ministry Pavement Surface Condition Rating Manual and the Pavement Distress Index (PDI) calculated according to the Ministry Pavement Distress Index model</td>
</tr>
<tr>
<td>Paved Traffic Lanes—Rutting</td>
<td>Where pavement rutting deterioration exceeds 20 mm in depth for any 50-m length of traffic lane</td>
<td>Undertake physical works to address noncompliance.</td>
<td>12 months</td>
<td>Transverse profile roughness measurements, expressed as calculated rut depth in millimeters for each wheel path as per the ministry survey specification and averaged</td>
</tr>
<tr>
<td><strong>Signs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Major Signs—Painted or Galvanized Surfaces</td>
<td>Where more than 10% of the total number of major overhead sign structures has a condition state worse than poor</td>
<td>Undertake physical remedial works to address painted or galvanized surfaces that are not in sound condition and/or free of corrosion.</td>
<td>12 months</td>
<td>Visual assessment</td>
</tr>
<tr>
<td><strong>Bridges</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bridges—Coating</td>
<td>Where more than 10% of the total number of steel bridge girders, assessed by total deck area, has a condition state worse than poor</td>
<td>Undertake physical works to address painted surfaces in poor condition, including corrosion.</td>
<td>12 months</td>
<td>Visual assessment</td>
</tr>
<tr>
<td>Bridges—Wearing Surface</td>
<td>Where more than 1% of the wearing surface, assessed by total deck area, has a condition state worse than poor</td>
<td>Undertake physical works to address unsound wearing surfaces, cracks, and deterioration affecting structure functional life.</td>
<td>12 months</td>
<td>Visual assessment</td>
</tr>
<tr>
<td>Where more than 5% of the wearing surface, assessed by total deck area, has a condition state worse than fair</td>
<td>Develop a remediation strategy or undertake physical works.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(continued)
### Appendix C: Example Summary Operations and Maintenance KPI Tables

(Table 34 continued)

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>Intervention Criteria: KPI</th>
<th>Action</th>
<th>Maximum Response Time</th>
<th>Basis of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bridges—Deck Joints</strong></td>
<td>Where more than 2% of the total length of deck joints, assessed by ((\text{number of spans}+1)\times\text{total deck area divided by bridge length}), has a condition state worse than poor</td>
<td>Undertake physical works to address structural damage, ineffective or inoperable joints, and projections affecting road users.</td>
<td>12 months</td>
<td>Visual assessment</td>
</tr>
<tr>
<td></td>
<td>Where more than 10% of the total length of deck joints, assessed by ((\text{number of spans}+1)\times\text{total deck area divided by bridge length}), has a condition state worse than poor</td>
<td>Develop a remediation strategy or undertake physical works to address defective joints with potential to create unsafe conditions for road users and reduction of structure functional life.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bridges—Bearings</strong></td>
<td>Where more than 2% of the total number of bearings, assessed by \text{total deck area}, has a condition state worse than poor</td>
<td>Undertake physical works to address structural damage and ineffective or inoperable bearings.</td>
<td>12 months</td>
<td>Visual assessment</td>
</tr>
<tr>
<td></td>
<td>Where more than 10% of the total number of bearings, assessed by \text{total deck area}, has a condition state worse than fair</td>
<td>Develop a remediation strategy or undertake physical works to address defective bearings with potential to create unsafe conditions for road users and reduction of structure functional life.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bridges—Bank, Bed Scour, and Buildup</strong></td>
<td>Where more than 1% of the total number of bridge spans has a bank, bed scour, or buildup condition state worse than poor</td>
<td>Undertake physical works to address scour, bank or approach instability, river channel blockage, and waterway alignments that cause high risk to the structure.</td>
<td>12 months</td>
<td>Visual assessment</td>
</tr>
<tr>
<td></td>
<td>Where more than 5% of the total number of bridge spans has a footings and pilings condition state worse than fair</td>
<td>Develop a remediation strategy to address scour, bank or approach instability, river channel blockage, and waterway alignments that cause high risk of erosion to the structure.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Note: Concessionaire is required to measure the condition for all traffic lanes, paved pullouts, stop areas, side roads, and entrance and exit ramp lanes annually.*
### Example Corridor Management Key Performance Measures

<table>
<thead>
<tr>
<th>Item</th>
<th>Key Performance Measures</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Public Relations and Customer Care | • Ensure that the public has a positive perception of the concession highway and its management.  
• Ensure that communication with all highway users is conducted promptly and in a professional manner  
• Achieve zero complaints on the processing of all communications | • Answer general and specific enquiries or requests for information.  
• Interact proactively with stakeholders.  
• Advise the media of road conditions.  
• Coordinate with the Provincial Highway Condition Centre to provide information and display accurate and timely messages on signage systems.  
• Receive and process applications from the public including, but not limited to, closing a road, performing works on or below the road surface, and constructing a road access. |
| Emergency Response and Management | • Maximize road availability.  
• Achieve a timely, 24/7 incident response service.  
• Minimize disruption to highway users.  
• Ensure that travel lanes are safe.  
• Reinstate asset (i.e., repair damage). | The concessionaire is required to do the following:  
• Ensure that staff contact information is available to the ministry, local governments, and emergency service providers and that notification required to respond to emergencies takes place.  
• Train employees in procedures on response and recovery and other types of emergency training required by the province.  
• Develop and apply an emergency response plan for emergencies such as, but not limited to, floods, avalanches, toxic spills, structural damage, and earthquakes. |
| Safety Management | • Reduce crash rate and number of fatalities.  
• Ensure that health and safety systems are implemented. | The concessionaire is responsible for the following:  
• Reduce the number and severity of crashes by applying proactive, best-practice road safety engineering techniques.  
• Reduce the number of known road safety hazards on the highway route.  
• Provide a road that is safe, consistent, free of surprises, and forgiving.  
• Eliminate all serious and fatal crashes where road conditions are deemed to be a contributing factor (mitigate all significant safety hazards along road sections that are reconstructed under the concession). |
| Access to Corridor | • Ensure compliance with the Highways Act and limit access to the highway to designated intersections and interchanges only. | The concessionaire is responsible for the following:  
• Monitor access onto secondary side roads by inspections every 6 months.  
• Conform with the operational performance measures. |

### Example Environmental Management Key Performance Measures

<table>
<thead>
<tr>
<th>Item</th>
<th>Key Performance Measures</th>
<th>Strategies</th>
</tr>
</thead>
</table>
| Identification of Environmental Impacts | • Develop, document, and maintain a register of identified areas of potential or known environmental hazards. | The concessionaire will operate, maintain, and rehabilitate the project in accordance with the following:  
• Habitat Conservation and Protection Guidelines, Fisheries and Oceans Canada, 1998  
• Standards and Best Practices for Instream Works, Ministry of Water, Land, and Air Protection, March 2004  
• Land Development Guidelines for the Protection of Aquatic Habitat, Department of Fisheries and Oceans Canada and Ministry of Environment, Lands, and Parks, 1992. |
| Assessment of Environmental Impacts | • Prioritize identified areas and activities of potential or actual environmental impact based on assessment of risk. |                                                                                                                                                                                                            |
| Mitigation and Management of Environmental Impacts | • Implement a program of environmental impact mitigation based on prioritized assessment of areas and activities of potential or actual environmental impact. Monitor and review effectiveness of environmental impact mitigation. |                                                                                                                                                                                                            |
### Appendix C: Example Summary Operations and Maintenance KPI Tables

#### TABLE 36. CLEM7 North-South Bypass Tunnel example project deed KPIs.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>KPI Benchmark</th>
<th>Level of Service</th>
<th>KPI Demerit Points</th>
<th>Assessment Period</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Reporting Requirements</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Target level of service—A report to council every 3 months on the performance of KPIs</td>
<td>100%</td>
<td>&lt;20 business days after quarter</td>
<td>0</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>20–40 business days</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;40 business days</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Customer Service and Satisfaction</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Target level of service—Customer calls answered within 20 seconds</td>
<td>90%</td>
<td>1 point for every 100 calls not answered within KPI benchmark</td>
<td>1 point for every 100 calls not answered</td>
<td>Monthly</td>
</tr>
<tr>
<td>3</td>
<td>Target level of service—Customer accounts with financial institutions credited or debited with the correct accounts</td>
<td>99.999%</td>
<td>&gt; 99.999%</td>
<td>0</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99.99–99.999%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99.95–99.9%</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;99.99–99.95%</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;99.9%</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Complaint resolution target level of service—Customers contacted by the customer service staff within 2 business days of a customer complaint</td>
<td>90%</td>
<td>10 points per occurrence outside of KPI benchmark</td>
<td>10 points per occurrence outside of KPI benchmark</td>
<td>Monthly</td>
</tr>
<tr>
<td>5</td>
<td>Transaction accuracy target level of service—Timeframes for charging transactions to real-time accurate reading customers’ account</td>
<td>99% within 2 days</td>
<td>&gt;99%</td>
<td>0</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>97%–98%</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;97%</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Accounts not overcharged</td>
<td>0%</td>
<td>0.1%–0%</td>
<td>10</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.2%–0.1%</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.3%–0.2%</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;0.3%</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Correct toll or fee assigned to correct account of complying vehicles</td>
<td>0.1% variance</td>
<td>0.2%–0.1%</td>
<td>10</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.3%–0.2%</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>0.4%–0.3%</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;0.4%</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Applications for toll account correctly responded to in 5 days</td>
<td>99%</td>
<td>1 point for every occurrence outside of KPI benchmark</td>
<td>1 point for every occurrence outside of KPI benchmark</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td><strong>Communication, Community Relations, and Consultation Management Obligations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Weekly council “Issues and Activities Report” addressing issues, response times, complaints, and corrective actions</td>
<td>100%</td>
<td>&lt;1 business day</td>
<td>0</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 business days</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;2 business days</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Free community enquiry line</td>
<td>99%</td>
<td>90%–100%</td>
<td>0</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>80%–90%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;80%</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Project Web site</td>
<td>99%</td>
<td>90%–100%</td>
<td>0</td>
<td>Monthly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>80%–90%</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&lt;80%</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>
### Operations and Maintenance Requirements

<table>
<thead>
<tr>
<th></th>
<th>Annual calendar of planned maintenance closures</th>
<th>100%</th>
<th>2 hours of additional closures</th>
<th>1 per additional 2 hours</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Maintenance at all times of ability of tunnel center to communicate with emergency services</td>
<td>99.99%</td>
<td>&gt;99.99</td>
<td>0</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99.9%–99.99%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99.8%–99.9%</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>99.7%–99.8%</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Tunnel air quality (CO, NO₂)</td>
<td>&lt;2</td>
<td>&lt;2 instances</td>
<td>0</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2–3 instances</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4–5 instances</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;5 instances</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Ambient air quality (CO, NO₂, PM, TSP)</td>
<td>0</td>
<td>No violations</td>
<td>0</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 violation</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 violations</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3 or more</td>
<td>15</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Water from treatment plan at acceptable levels</td>
<td>100%</td>
<td>0–1 violation</td>
<td>-10</td>
<td>Yearly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2–5 violations</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6–9 violations</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10 or more</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>

### Incident Response

<table>
<thead>
<tr>
<th></th>
<th>Initial response time to detect incidents by operator</th>
<th>1–2 minutes</th>
<th>&lt;1 minute</th>
<th>-10</th>
<th>Monthly</th>
</tr>
</thead>
<tbody>
<tr>
<td>17</td>
<td></td>
<td></td>
<td>1–2 minutes</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2–3 minutes</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3–4 minutes</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;7 minutes</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Service crew response time to incidents</td>
<td>10–13 minutes</td>
<td>&lt;8 minutes</td>
<td>-20</td>
<td>Quarterly</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8–10 minutes</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10–13 minutes</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13–16 minutes</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>16–19 minutes</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;19 minutes</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

### Aesthetics

<table>
<thead>
<tr>
<th></th>
<th>Rapid response time to nominate defects that impact aesthetics or public perception of tollroad or landscaping</th>
<th>0–2 days</th>
<th>&lt;2 days</th>
<th>-20</th>
<th>Yearly</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td></td>
<td></td>
<td>0–2 days</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2–4 days</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>&gt;4 days</td>
<td>20</td>
<td></td>
</tr>
</tbody>
</table>
### TABLE 37. CLEM7 North-South Bypass Tunnel example operating company KPIs.

<table>
<thead>
<tr>
<th>KPI Area</th>
<th>KPI</th>
<th>Measures</th>
<th>Target</th>
<th>Frequency</th>
</tr>
</thead>
</table>
| Asset Condition | All management systems operating | Asset management response times  
Asset management inspections and routine maintenance  
Improvement initiatives investigated and proactive procedures and systems developed | To be based on equipment and materials selected in final design        | Monthly   |
| Compliance | Meet environmental coordinator general’s conditions | Nonconformity with environmental management plan  
Environmental issues investigated and remediated | Nil  
Targets to be established | Monthly  
Quarterly |
| Commercial | Manage O&M costs | Achieve budget  
Benchmark top five expenditure firms | Nil  
Targets to be established | Monthly  
Yearly |
| Stakeholders | O&M relationship | Assessment against preagreed criteria:  
• Daily cooperation with emergency services  
• Handling of public complaints  
• General facility appearance  
• Handling of environmental issues  
• Proactive approach to safety | Assessment matrix to be developed | Quarterly |
| Employees    | Safety Satisfaction Engagement | Level of compliance to workplace safety | TBD | TBD |
Appendix B

Supplemental Documents

Exhibits B.1 and B.2
Exhibit B.1

NCDOT: Pilot Project Version 1 - Contract Scope of Services, Performance Criteria and Payment Sample Calculation from BAFO RFP

For more information on the BAFO RFP view the agencies performance-based maintenance webpage located in the reference below.

Reference:


Used with permission by Jennifer Brandenburg
Final RFP for Best and Final Offer (BAFO)

Interstate Maintenance

WBS Element 40682

January 10, 2007

Void for Bidding

Date and time of price proposal submission: January 24, 2007 at 4:00 PM

Date and time of price proposal opening: January 25, 2007 at 10:00 AM

WBS Element No.: 40682

Counties: Mecklenburg, Gaston, Cabarrus, and Cleveland

Route No.: I-77, I-85, I-485, & I-277

Miles: 131 Centerline miles

Location: I-77, I-85, I-485 and I-277 in Mecklenburg, Gaston, Cabarrus, and Cleveland Counties

Type of Work: Interstate maintenance as specified in the scope of work contained in the request for proposal

Notice:

All proposers shall comply with all applicable laws regulating the practice of general contracting as contained in Chapter 87 of the General Statutes of North Carolina which requires the proposer to be licensed by the N.C. Licensing Board for Contractors when bidding on any non-federal aid project where the bid is $30,000 or more, except for certain specialty work as determined by the Licensing Board. Proposers shall also comply with all other applicable laws regulating the practices of electrical, plumbing, heating and air conditioning and refrigeration contracting as contained in Chapter 87 of the General Statutes of North Carolina. Notwithstanding these limitations on bidding, the proposer who is awarded any project shall comply with Chapter 87 of the General Statutes of North Carolina for licensing requirements within 60 calendar days of bid opening, regardless of funding sources.

5% bid bond or bid deposit required

This BAFO RFP contains Addendum #1 and #2. The highlighted changes in this RFP reflect only the changes made as a result of the Best and Final Offer process.
**SCOPE OF WORK**

The requirements of this contract apply to interstate transportation facilities within the state road right of way. The Contractor shall manage and perform maintenance and repair activities associated with roadways, drainage, structures, roadside, vegetation and aesthetics, traffic services, emergency response and as otherwise contained herein. The contractor shall also be responsible for any traffic control, design, shop drawings, and permits required to satisfy the duties required by this contract.

The scope of work for this project shall include the management and performance of maintenance and repair activities on approximately 131 center-line miles of interstate highways. The project will include management and performance of routine maintenance of, and repairs to, I-85, I-77, I-277 and I-485 in Mecklenburg, Gaston, and Cleveland Counties. In addition, the project will extend on I-85 up to the point at which the pavement section changes at the Southernmost exit in Cabarrus County. The contract will also include maintenance and repair activities for projects that are currently under construction and are all anticipated to be completed in 2006 or 2007. The requirements of this contract will become this Contractor’s responsibility upon final acceptance of the construction project by the Department. These projects are as follows:

- R-2248BB  2.3 ± miles of new six-lane section on I-485
- R-2248C  4.6 ± miles of new six-lane section on I-485
- R-2248D  5.5 ± miles of new six-lane section on I-485


The scope of this contract is not to bring all facilities up to current design standards. However, if an asset must be replaced (e.g. guardrail end units, impact attenuators, sign structures, etc.) than that asset must be replaced in a manner such that current design standards are met.
Areas of work required for this project shall include, but are not limited, to routine maintenance, minor repairs, collision damage repairs, and emergency repairs for the following items as detailed in the Performance Criteria contained elsewhere in this RFP:

1. Shoulder and Ditches
2. Drainage
3. Roadside
4. Roadside Appurtenances
5. Traffic
6. Pavement
7. Bridge
8. Timeliness of Performance

The Contractor shall manage all assets within the project limits that are not specifically excluded within this RFP. The Contractor shall perform routine maintenance, minor repairs, collision damage repairs and emergency repair activities as necessary. These maintenance activities will be performed at a frequency that ensures uniform and consistent compliance with the performance criteria and requirements specified herein.

The project limits are further defined as follows:

(a) All assets located within the controlled access fences of the transportation facilities, unless otherwise stated within.
(b) All interchanges, crossovers and ramps to the point at which the ramp or loop intersects the crossing facility.
(c) All overpasses that carry the interstate, including bridge superstructure and substructure.
(d) Maintenance of the substructure of all highway bridges over the interstate facilities.
(e) Repair of any portion of bridges over the interstate facilities necessitated by damage from traffic travelling on the interstate.
(f) All permanent drainage easements associated with the highway corridor including compliance with any permit requirements.
(g) All Rest Area and Weigh Station roadways to the back of curb and the roadway drainage system (from entrance ramp through the parking area to exit ramp of the Rest Area) as well as high-mast roadway lighting within the Rest Areas.
(h) Regulatory, Warning, Guide, and Facility (airport, railroad, commuter parking, rest area, welcome center) signs will be the responsibility of the Contractor.

The Department will provide a recent Maintenance Condition Assessment of the existing facilities. In addition, various as-built drawings are available for viewing at the Division 10 and 12 offices. The Department in no way guarantees the accuracy or sufficiency of these documents and the Contractor shall be fully responsible for verifying the existing asset inventory to their own satisfaction.
EXCLUSIONS

This project specifically excludes:

(a) Frontage roads
(b) Repair or maintenance of bridges over the interstate facilities caused by anything other than damage from traffic travelling on the interstates.
(c) Repair or maintenance of Railroad bridges
(d) Fog detection, closed circuit televisions, traffic counters, signal loops, Highway Advisory Radio (HAR) and Changeable Message Signs (CMS) and associated electronics, power and communication infrastructure.
(e) Rest Area and Weigh Station Janitorial, Buildings, Equipment, and Grounds Maintenance. Mowing at rest areas to the limit of the gore areas.
(f) The installation and maintenance of LOGO signs, General Motorist Service signs, and informational safety signs for specific events (e.g. Lowe’s Motor Speedway).
(g) NCDOT will perform Bridge, Culvert, roadside Sign Structure, Over Head Sign, and High Mast Light Pole Inspection in accordance with Department Standards and Specifications. NCDOT will also perform structural analyses when, as a result of routine or incident inspection, significant section loss is observed due to deterioration or damage. Nothing in this paragraph relieves the Contractor from its responsibility to make repairs deemed necessary as a result of the inspections.
(h) Maintenance activities covered by a Municipal Agreement as provided by the Department.
(i) All activities associated with Outdoor Advertising (ODA), Selective Vegetation Removal (SVR), and requests by utility companies to control vegetation with herbicides on the highway right-of-way.
(j) Facilitation of Adopt a Highway segments. The expansion or continuation of this program on any facility segments in no way relieves the Contractor of satisfying the performance criteria contained in this RFP.
(k) Wildflower Program and beds
(l) Right-of-Way Fence
(m) Incident Management Assistance Patrols
(n) All overhead sign lighting in Division 12
(o) All White on Green Guide signs will be supplied by the Department
(p) I-277 roadway lighting system as well as the lighting system on I-77 from the I-85 interchange southward to the South Carolina state line. However, in the event that the Department upgrades either of these systems during the contract period(s), the Contractor will become responsible for the lighting to the same extent they are responsible for any other existing roadway lighting.
(q) Prompt Action Notices issued for bridge repairs or rehabilitation
(r) Vegetation management in the vicinity of University Research Park. See Vegetation Management Project Special Provision.
(s) Several plant beds (map to be provided) located near the I-277/US-74 interchange are currently abandoned and only require the Contractor to control unsightly growth. During the contract, these beds may be planted by the Department at which time they will be subject to the same level of contractor maintenance as all other plant beds.
DEFINITIONS

Routine Maintenance is defined as the restoration of an asset, including all its appurtenances, to meet acceptable performance criteria as contained herein. Routine maintenance also includes all preventative maintenance activities.

Minor repairs are defined as repairs to return an asset to a structurally sound condition (e.g., no loss of strength, functionality), but may have minor section loss, cracking, etc. Minor repairs include any activity intended to correct the effects of minor material deterioration by restoring the damaged component.

Collision Damage Repairs are defined as any repairs necessitated by collision of any type vehicle with a portion of the transportation facilities. Generally these will include third party claims to which the Contractor will be entitled as indicated elsewhere in this RFP.

Emergency Repairs are defined as those repairs necessitated by a natural disaster or as deemed necessary through exposure via a routine inspection by either the Contractor or the NCDOT. Some of these will include third party claims to which the Contractor will be entitled as indicated elsewhere in this RFP.

Typical routine maintenance activities are shown below. This list of activities is not intended to be all inclusive as other activities may be needed in order to meet the specified performance criteria.

- Environmental Permitting
- Unpaved Ditches - Clean and Reshape
- Engineering Duties
- Paved Ditches - Clean and Repair
- Asphalt Pothole Repair (Manual)
- Routine Mowing
- Asphalt Pothole Repair (Mechanical)
- Slope Mowing
- Base Repair
- Debris and Road Kill Removal
- Pressure Grouting
- Pavement Markings and Markers
- Concrete Pavement Joint Repair
- Roadside Vegetation Control
- Concrete Slope Pavement Joint Repair
- Tree Trimming and Removal
- Concrete Pavement Surface Pothole
- Landscape Area Maintenance
- Repairing Non-Paved Shoulders, Front Slopes and Roadside Ditches (Manual)
- Erosion and Sedimentation Control
- Seeding, Fertilizing and Mulching
- Storm Water Management
- Reworking Non-Paved Shoulders, Front Slopes and Roadside Ditches (Mech.)
- Delineators
- Miscellaneous Slope and Ditch Repair
- Ground Signs and all Overhead Signs
- Clean Drainage Structures
- Sign Cleaning
Repaired Storm Drains, Side Drains, Cross Drains
Concrete Repair
Attenuator Repair
Graffiti Removal
Roadside Litter Removal
Road Sweeping
Edging and Sweeping
Highway Lighting Maintenance
Overhead Sign
Structure Maintenance
Concrete Slab Repair and Replacement
Guardrail Repair
***Deleted “Fence Repair”***
Raised Pavement Marker Replacement
Glare Screens
Emergency Repairs
Barrier Wall
Noise Walls
Rest Area and Weigh Stations (roadways, drainage, lighting)
Bridge & Culvert Maintenance
Winter Weather Event (if Snow and Ice Option is exercised by the Department)

**WORK PLANS AND REPORTS**

The following plans are required of the Contractor at various times during the contract. Failure to submit any of the required documents listed below will result in withholding monthly payments to the Contractor until the acceptable documents are received by NCDOT.

**Quality Management Plan**

A Quality Management Plan shall be delivered as a part of the Technical proposal. The Quality Management Plan shall describe in detail how the Contractor shall monitor its own performance to ensure that the Performance Criteria are to be achieved. The Quality Management Plan shall define the procedures to ensure that all work meets or exceeds the Performance Criteria contained herein. The Quality Management Plan shall incorporate reporting procedures compatible with the NCDOT’s Maintenance Management System (MMS) to ensure approval of proposed work, services and products.

**Quality Management Reports**

The Contractor shall furnish hard copy and electronic access to quality management reports prepared as a result of the Quality Management Plan monitoring.

**Annual Implementation Work Plan**

No later than 60 days after the Notice of Award, the Contractor shall deliver to the Department an Implementation Plan, in form and substance satisfactory to the Department, covering the first calendar year of the contract period. The Implementation Plan shall be broken down by month and by work element, and shall describe the expected work for the upcoming year. The
Implementation Plan shall include a budget broken down by work element. In preparing the Implementation Plan, the Contractor shall consult and coordinate with appropriate Department staff, as necessary. A revised Implementation Plan shall be presented to the Department no later than the 1st of January, each year for the duration of the contract. The revised implementation plan shall also include expenditures for each work element for the prior year. In lieu of actual dollars expended, the expenditures for each work element shall be shown as a percentage of the total expenditures for that year.

Monthly Report

No later than the 15th of each month, the Contractor shall deliver to the Department a Monthly Report covering the prior month’s activities and accomplishments. The report may be furnished as part of the monthly invoice for services. The Monthly Report shall describe all completed work for each specific asset type, reported by location, county and Division. The information shall also include unit of measure, mile marker, direction, GPS coordinates, length, size, type and resulting condition. The Contractor shall also provide monthly expenditures for MB/WB and Small Business Enterprises. This report shall be delivered in an electronic format compatible with the NCDOT Maintenance Management System (MMS).

The Contractor is not responsible for interacting with the MMS other than to provide the above information in a format compatible with MMS. The Department will provide the typical format that shall be used upon award of the contract.

Weekly Work Plan

The Contractor shall provide a Work Plan every Wednesday to the Metrolina Regional Transportation Management Center (MRTMC) and the Engineer concurrently. The Work Plan shall designate the intended work to be performed the following week. The Contractor shall include any planned lane closures in this Work Plan.

Customer Service Response Log

The Contractor shall develop, implement and maintain a Customer Service Response Log. The log shall itemize all complaints/requests, time/date of complaint, and the disposition thereof. The customer service log shall be made available to the Department for review on the first day of each month or upon request. The Contractor may use the Department’s Citizen Action Reporting System (CARS) to assist in the maintenance of this log.

*** Deleted intermediate contract times and liquidated damages for customer responses and resolutions. ***

In some cases, NCDOT may direct the Contractor to respond to customer requests immediately.

Emergency Response Plan

The Contractor shall prepare and furnish to the Department for its review and approval an Emergency Response Plan within 30 days after the Notice of Award. This plan shall outline the
Contractor’s response procedures in the event of an emergency, collision damage, and adverse weather conditions including hurricanes, rain, snow, ice, flooding and fog. The plan shall address the Contractor’s coordination procedures with the Department, the State Highway Patrol and other emergency personnel during emergency events.

**Public Information Plan**

The Contractor shall prepare and furnish to the Department for its review and approval a draft Public Information Plan within 60 days after the Notice of Award. Within 90 days after the Notice of Award, the Contractor shall coordinate with Department personnel, to finalize and implement the Public Information Plan. During this 90-Day period, all information regarding this contract and the services required herein shall be disseminated through the Department.

The Public Information Plan shall prescribe roles, responsibilities and procedures regarding public communications including:

- The dissemination of information regarding the Contractor’s contracting approach.
- Procedures for providing information to the Travelers Information Management System (TIMS).
- The issuance of activity update bulletins.

The Contractor shall not issue press releases or otherwise communicate directly with the media (except as otherwise provided in the Public Information Plan) without the Department's approval.

The Contractor shall attend a TIMS/511 briefing within 60 days after Notice of Award.

**Snow and Ice Removal Plan**

In the event that the Department elects to exercise the option to include Snow and Ice Removal as part of this contract, the Contractor shall submit a Snow and Ice Removal Plan prior to September 1st of each year. The plan shall address the Contractor’s procedures, equipment, materials, staging areas, manpower, communication network, priorities, and other information deemed necessary.

**EMERGENCY PREPARATION RESPONSE**

The Contractor shall cooperate with the Department and may be required to furnish its forces (to include subcontractors) to supplement the Department in Hurricane Preparedness, Evacuation Plans and Execution of these Plans for the duration of the event within the project limits.

In the event that services or equipment are required by the Department for emergency preparation response, such services and equipment will be deemed as Extra Work and paid for in accordance with Article 104–8(A) of the Standard Specifications.
INCIDENT RESPONSE

The Department will continue to utilize existing Incident Management Assistance Patrols during this contract. The Contractor will not be responsible for responding to abandoned vehicles, traffic accidents, or other shoulder or lane-blocking incidents except as may be set forth elsewhere in this RFP.

The Contractor shall immediately notify the Department’s MRTMC and the Engineer of all traffic slowing incidents that are discovered during the course of their work or are caused by the Contractor’s operations.

EMERGENCY MAINTENANCE REPAIRS

The Contractor is responsible for immediately responding to emergency situations that pose an imminent risk to the travelling public (e.g. sink holes, flooding, etc.). An intermediate contract time of 2 hours after notification or discovery will apply to initiating corrective measures for situations that pose an imminent risk to the travelling public. Initiating corrective measures includes initial response, assessment, traffic control to protect the travelling public, and the determination, coordination, and execution of corrective measures to restore traffic. In the event that the Contractor fails to initiate corrective measures within 2 hours after notification or discovery, liquidated damages in the amount of $5,000 per hour, or portion thereof, will be deducted from the monies due to the Contractor.

The Contractor shall immediately notify the Department’s MRTMC and the Engineer of all emergency situations.

PERMITS

The Contractor is responsible for preparing all documents and obtaining any and all permits, including those for navigable waterways, necessary to complete the work required in this contract.

TRAFFIC CONTROL

The Contractor shall maintain traffic in accordance with the 2006 Standard Specifications, Roadway Standard Drawings, the Manual of Uniform Traffic Control Devices (MUTCD), the NCDOT Supplement to the MUTCD, and the following provisions:

Traffic Control Plan (TCP)

Prior to commencing an activity that will restrict or divert traffic, including lane closures and detours, the Contractor shall prepare, and furnish to the Department for review and approval a Traffic Control Plan. A standard Traffic Control Plan may be prepared and pre-approved for each typical operation. The NCDOT Work Zone Traffic Control Unit website contains information necessary for the proper development of these plans. In addition, standard traffic control plans for typical operations may be available for use.
As required by the approved TCP, the Contractor shall provide, install, maintain such temporary barrier, pavement markings, lights, signs and other devices and take such other protective measures as are necessary to prevent accidents, damage or injury to the public, and as required by the Traffic Control Plan and the Manuals, Standards and Procedures.

**Notification of Planned Work**

Planned lane closures shall be included in the Weekly Work Plan. In addition, the Contractor shall notify the Engineer and the MRTMC at least 8 hours before a planned lane closure is installed and notify the designated MRTMC within 30 minutes after the planned lane closure is removed. If the Contractor is found to have installed a lane closure without notifying MRTMC, NCDOT may require the Contractor to immediately remove the lane closure and may require the Contractor to refrain from installing all planned lane closures until such time as the Contractor can demonstrate to NCDOT that the Contractor can fully comply with these notification requirements.

**Time Restrictions**

No road closures are allowed unless authorized by the Engineer. The time restrictions listed below apply to planned lane and shoulder closures only. The Contractor shall not install, maintain or remove any traffic control device required for narrowing or closing a lane or shoulder during the times listed below. Lane closures for emergency response are not subject to these time restrictions. An intermediate contract time applies to lane narrowing, lane closing, shoulder closing, and holiday and event restrictions.

**Liquidated Damages for lane narrowing, lane closing, shoulder closing, and holiday and event restrictions for I-77, I-277, I-485, and I-85 are $10,000.00 per hour for this Intermediate Contract Time.** In areas where a median contains guardrail or median barrier rail in close proximity to the travelway, operations that require shoulder closure will also require a lane closure and will therefore be subject to the time restrictions and liquidated damages associated with lane closures.

<table>
<thead>
<tr>
<th>Road name</th>
<th>Time Restrictions</th>
</tr>
</thead>
</table>
| For Lane Closures | 6:00am to 8:00pm, Monday through Friday  
9:00am to 6:00pm, Saturday and Sunday |
| I-85, I-485 and I-277 |  |
| I-77 | 6:00am to 9:00pm, Monday through Friday  
9:00am to 6:00pm, Saturday and Sunday |
| For Shoulder Closures |  |
| I-85, I-485 and I-277 | 6:00am to 9:00am and 4:00pm to 7:00pm, Monday through Friday |
| I-77 | 6:00am to 9:00am and 4:00pm to 9:00pm, Monday thru Friday |
The Contractor shall not close or narrow a lane of traffic, detain and/or alter the traffic flow during holidays, holiday weekends, special events, or any other time when traffic is unusually heavy on any of the roadways listed above, including the following schedules:

- For New Year's, between the hours of 6:00 a.m. December 31st to 9:00 p.m. January 2nd. If New Year's day is on a Saturday or a Sunday, then until 9:00 p.m. the following Tuesday.

- For Easter, between the hours of 6:00 a.m. Thursday and 9:00 p.m. Monday.

- For Memorial Day, between the hours of 6:00 a.m. Friday to 9:00 p.m. Tuesday.

- For Independence Day, between the hours of 6:00 a.m. the day before Independence Day and 9:00 p.m. the day after Independence Day. If Independence Day is on a Saturday or Sunday, then between the hours of 6:00 a.m. the Thursday before Independence Day and 9:00 p.m. the Tuesday after Independence Day.

- For Labor Day, between the hours of 6:00 a.m. Friday to 9:00 p.m. Tuesday.

- For Thanksgiving, between the hours of 6:00 a.m. Tuesday to 9:00 p.m. Monday.

- For Christmas, between the hours of 6:00 a.m. the Friday before the week of Christmas day and 9:00 p.m. the following Monday after the week of Christmas.

- For any NASCAR event at the Lowes Motor Speedway, between the hours of 6:00 a.m. the Thursday the week of the event until 8:00 p.m. the following Monday after the race.

- For any Carolina Panthers Football game in Charlotte and any games at the Bobcats Arena, from three hours before the game until 3 hours after the game.

- For any event which creates high traffic volumes, between the hours of 7:00 a.m. the Friday of the week of the event and 8:00 p.m. the Monday after the week of the event. Such events may be at Bank of America Stadium, Charlotte Convention Center or other arenas. The Engineer will provide guidance on what events constitute unusually high traffic volumes.

HAZARDOUS WASTE REMOVAL

The Contractor shall dispose of, or cause the disposal of dead animals, and all waste, residue, debris, materials and supplies (including paints, herbicides and chemicals), foliage clippings, and other waste materials produced or generated by the Contractor under this contract.

The Contractor shall use, contain, store and dispose of all hazardous substances employed in connection with this contract in accordance with all applicable Federal, State and Local Laws, Regulations and Ordinances.

Unknown hazardous materials that may exist with the project limits will be handled in accordance with Article 107-26 of 2006 Standard Specifications.
With respect to Asset Maintenance Services relating to bridge structures that have existing coatings that include Hazardous Substances, such as lead, chromium and cadmium, the Contractor shall, where required, remove, handle, store, transport and dispose of such Hazardous Substances in accordance with applicable Federal, State and Local Laws, Regulations, and Ordinances.

*** Deleted statement referencing “Incident Response.” ***

**SNOW AND ICE CONTROL (ALTERNATE BID ITEM)**

This section applies only if the Department exercises its right to accept the Contractor’s Price Proposal for the alternate bid item “Maintenance Services Including Snow and Ice Removal”. Reference the Project Special Provision “Alternate Bid Item for Snow and Ice Removal” found elsewhere in this RFP.

The Contractor will be responsible for prompt removal of snow and ice throughout the project limits beginning September 1st, 2007.

Not later than July 1st of each year, the Contractor shall demonstrate to the reasonable satisfaction of the Engineer that it has sufficient resources (including equipment, materials, supplies and personnel) to fully perform Snow and Ice Control on all segments of the contracted transportation facilities for the following year. If by August 1st the Contractor fails to satisfy the Department that it has sufficient resources to undertake snow and ice removal during the following winter season, the Department may terminate for cause this portion of the contract and monthly payments will be adjusted in accordance with the Project Special Provision “Alternate Bid Item for Snow and Ice Removal”

The Contractor shall respond and deploy resources to ensure that at least one travel lane in each direction is passable at all times. In the event that the Contractor fails to maintain, in a passable condition, at least one continuous lane in each direction, liquidated damages in the amount of $4,000 per direction per hour, or portion thereof, will be deducted from the monies due to the Contractor.

The Contractor shall continue snow and ice removal until such time that all travel lanes are clear and passable (icy spots allowed). An intermediate contract time of 12 hours will apply from the end of the winter weather event. In the event that the Contractor fails to make clear and passable all travel lanes within this intermediate contract time, liquidated damages in the amount of $2,500 per lane per hour, or portion thereof, will be deducted from the monies due the Contractor.

The Contractor shall continue snow and ice removal until such time that all travel lanes are 100% free from frozen precipitation. An intermediate contract time of 24 hours will apply from the end of the winter weather event. In the event that the Contractor fails to remove all frozen precipitation within this intermediate contract time, liquidated damages in the amount of $1,000 per lane per hour, or portion thereof, will be deducted from the monies due the Contractor.
The Contractor shall plow all shoulders immediately following the end of the winter weather event. **An intermediate contract time of 36 hours will apply from the end of the winter weather event.** In the event that the Contractor fails to plow all shoulders within this intermediate contract time, liquidated damages of $1,000 per shoulder mile per hour, or portion thereof, will be deducted from the monies due to the Contractor.

During winter weather conditions, the Contractor shall contact MRTMC at 7:00 am and 3:00 pm to advise of road conditions. The Contractor shall also update the MRTMC continually as conditions change. MRTMC will enter this information into TIMS.

No sand, slag, or similar material shall be used on open-graded asphalt surface course sections.
*** PERFORMANCE CRITERIA AND CONTRACT PAYMENT ***

PERFORMANCE CRITERIA

The performance criteria and target ratings are shown in Tables 1 – 7. Each table represents a “component” of the overall Maintenance Condition Assessment (MCA). Each row within each table represents an “element” of that component. Each element has associated performance criteria that will be used to determine the performance rating for that element. Next to the element name, the weight of that element within the component is shown in parentheses.

EVALUATION PROCEDURES

An initial Maintenance Condition Assessment will be performed by the Department and provided to the prospective contractors prior to the submission of Proposals.

A new condition assessment will be made by Department personnel every six months of the contract. The first assessment will begin October 1, 2007. Each assessment will be completed incrementally and will occur randomly throughout the project limits. Throughout the remainder of the contract, assessments will occur once in every 6-month period beginning each January 1st and July 1st. The Department reserves the right to perform additional assessments for any element within the Roadside component. The results of these additional element level assessments will be used in lieu of that from the prior regularly scheduled assessment.

In addition, if the contractor is below the performance target on any element in the Roadside component, the contractor may request that the Department re-evaluate that element(s) prior to the next 6-month assessment period. The Roadside element(s) will be re-evaluated with the same performance criteria listed in Table 4. The element rating determined through any re-evaluation of a Roadside element will then be used to re-calculate the partial payment. This re-calculated partial payment will take effect with the next month’s partial payment and will remain in effect until the next condition assessment ratings are evaluated and a new partial payment is calculated. The option for a re-evaluation of Roadside elements may not be exercised more than once a month.

Linear samples, in lengths of 0.2 miles, will be made in sufficient quantity to ensure 95% confidence that the samples represent the condition assessment throughout the entire project limits. Gross deficiencies will be brought to the Contractor’s attention as soon as is practicable during or each assessment.

Upon request, specific sample data will be made available to the Contractor within 14 calendar days following notification of the condition assessment results. The Contractor may dispute element ratings only. Such dispute shall be made in writing to the Engineer within 30 calendar days of notification of the condition assessment results. The amount of the partial payment calculated in accordance with the procedures outlined herein will continue notwithstanding any time that elapses during dispute resolution. If through dispute resolution, any element rating is revised, the partial payment will be re-calculated and the amount of the change in the partial payment amount will be returned to the Contractor with the next month’s partial payment.
MAINTENANCE CONDITION ASSESSMENT (MCA) RATING

The element ratings are weighted in Tables 1 – 7 to determine an overall MCA rating. The MCA targets are as follows:

- Calendar Year 2007: 88
- Calendar Year 2008: 90
- Calendar Years 2009 – 2012: 92

If in four consecutive assessments, the overall MCA rating is more than 5 points below the applicable overall MCA target, the Department shall have the right to declare the Contractor in default of contract.

If, in four consecutive assessments, any element is more than 15 points below the applicable target for that element, the Department shall have the right to declare the Contractor in default of contract.

PHASED PERFORMANCE TARGETS

In addition to the MCA, some elements have a performance target that increases within the first three years of the contract. These elements will be clearly indicated in the tables as a performance target followed by a calendar year in parentheses.

PARTIAL PAYMENTS BASED ON PERFORMANCE

An example of the calculation of partial payment based on performance is provided in the table following this section. This example is based on the targets for calendar year 2007.

The unit price bid is the bid per month as indicated on the Itemized Proposal Sheet for either “Maintenance Services Excluding Snow and Ice Removal” or “Maintenance Services Including Snow and Ice Removal”, whichever bid alternate is exercised by the Department, and as adjusted in accordance with the Project Special Provision “Annual Price Adjustments.”

Beginning with the January 2008 partial payment, the monthly partial payment will be based on the contractor’s performance rating for each element during the previous assessment period. The January 2008 partial payment and that for the five subsequent months will be based on the assessment begun in October 2007. Monthly partial payments will be reflective of the most recent condition assessment and will be applied to each monthly partial payment following the assessment period. This payment amount will remain in effect until the next condition assessment ratings are evaluated and a new partial payment is calculated.

The partial payments are based solely on the performance at the element level, minus any applicable liquidated damages as outlined elsewhere in this RFP. Each partial payment will be the sum of the payments attributable to each element and its element value. Based on performance, the contractor will be paid up to the full amount of the element value for each...
element. The element value for each element is defined as the element weight multiplied by the unit price bid.

The contractor will be paid the full amount of the element value for each element where the applicable Performance Target is met. The contractor will be paid a percentage of the element value based on a graduated scale when failing to meet the applicable Performance Target. If the contractor’s performance is 1-5 points below the performance target, the payment for that element will be $75\%$ of the element value. If the contractor’s performance is 6-10 points below the Performance Target, the payment for that element will be $50\%$ of the element value. If the contractor’s performance is greater than 10 points below the Performance Target, the contractor will receive no payment for that element. The element weights that will be used to calculate the element values are listed in Tables 1-7 and included in the sample assessment spreadsheet.

**TIMELINESS TARGETS**

Table 8 provides timeliness requirements for certain activities. These timeliness requirements are not used in the partial payment calculations but are enforced through liquidated damages as indicated throughout the “Scope of Work”. For those activities that do not have liquidated damages, if the timeliness requirement for any one activity is not fulfilled in at least $80\%$ of the occurrences in any 6-month assessment period, the Contractor may be deemed in default of contract.
## TABLE 1

**SHOULDER AND DITCHES (0.1)**

*** Component Targets deleted throughout the tables ***

<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unpaved Shoulders (Low Shoulder) (0.04)</td>
<td>Safe Smooth</td>
<td>95 (2009-2012) 90 (2008) 85 (2007)</td>
<td>• No dropoffs greater than 2” within 4’ of the edge of pavement</td>
</tr>
</tbody>
</table>
| Unpaved Shoulders (High Shoulder) (0.03) | Safe Smooth | 95 (2009-2012) 90 (2008) 85 (2007) | • No shoulders higher than 1” within 4’ of the edge of pavement  
  • No shoulders that cause water to drain back within the travelway |
| Lateral Ditches (Includes Rip Rap and Paved) (0.03) | No blockage or erosion. Functioning as designed | 95 (2009-2012) 90 (2008) 85 (2007) | • No more than 50% blocked  
  • No erosion greater than 1’ below original ditch line  
  • No joint separation, misalignment, or undermining in paved ditches |
# TABLE 2

## DRAINAGE (0.1)

<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
| Crossline Pipes (< 54”) (Blocked) (0.03) | Open Drains, No Erosion | 95 (2009-2012), 90 (2008), 85 (2007) | • Greater than 75% diameter open and/or meets environmental permitting requirements  
• No evidence of flooding  
• Minimal erosion at ends  
• End protection intact.  
• No obstructions to water flow. |
| Crossline Pipes (<54”) (Damaged) (0.02) | No pipe, pavement, or shoulder damage | 95 (2009-2012), 90 (2008), 85 (2007) | • No damage due to cracking, joint failures, or corrosion.  
• No water infiltration causing pavement failures, shoulder failures, or roadway settlement. |
| Drop Inlets/Catch Basins/Shoulder Drains/Funnel Drains/etc. (Blocked) (0.02) | Open Drains | 98 (2009-2012), 90 (2008), 85 (2007) | • Grates and Outlets not blocked greater than 50%  
• Minimal erosion.  
• Outfalls functional. |
| Drop Inlets/Catch Basins/Shoulder Drains/Funnel Drains/etc. (Damaged) (0.01) | Functional | 98 (2009-2012), 90 (2008), 85 (2007) | • Grates are present and not broken  
• No erosion/settlement around boxes  
• Outlets are not damaged and are functioning properly  
• End protection intact with no erosion |
| Curb & Gutter, Valley Gutter/ Median Barrier (Blocked) (0.01) | No blockage, No spread into lane | 95 (2009-2012), 90 (2008), 85 (2007) | • No obstruction greater than 2” for a length of 2’  
• Runoff does not spread into travelway for a distance of half the lane width |
| Curb & Gutter/ Valley Gutter/ Median Barrier (Damaged) (0.01) | Functional | 95 (2009-2012), 90 (2008), 85 (2007) | • No cracking, settlement, joint separation, misalignment, or deterioration |
**TABLE 3**

**ROADSIDE APPURTENANCES (0.15)**

<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
| Guardrail/ Cable Rail (0.09) | Functional Repairs per current Standards | 95 (2007-2012) | • All guardrail and cable guiderail is functional  
• Contractor to respond to all failures, which include site mitigation and repairs, and immediately address unsafe conditions  
• No dents or deterioration that decrease structural integrity. |
| Concrete Median Barrier (0.015) | Structurally safe/sound | 95 (2007-2012) | • Clean  
• Free of vegetation  
• Straightened  
• Repaired and or replaced, if damaged. |
| Noise Walls (0.015) | Structurally Sound Clean | 95 (2007-2012) | • No missing or broken pieces  
• No damage  
• No grafitti or vegetation |
| Impact Attenuators (0.03) | Present Operational | 95 (2007-2012) | • No missing parts, properly maintained and undamaged.  
• Contractor to respond to all failures, and immediately address unsafe conditions |
<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
| Mowing (0.03)           | Grass height & mowing quality | 90 (2007-2012) | • For all grass species, grass height not to exceed 15 inches, nor less than 6 inches  
• All mowing to be of a high quality to present a neat appearance  
• In compliance with all other Department mowing specifications. |
| Landscape Plant Beds (0.0225) | Primary emphasis on aesthetics; also environ. safety factors | 80 (2008-2012)  
70 (2007) | • Overall appearance is neat and well maintained.  
• Ornamentals and shrubs maintained for optimum aesthetics and plant health.  
• Plant beds regularly mulched and weed free.  
• Must follow IRVM program as established by NRVMA & as adopted by NCDOT.  
• Contractor will utilize and be evaluated on the “Roadside Environmental Landscape Plant Bed Inspection Report”  
• No excessive “brown-out”, pre-approval of herbicides from the Engineer required |
| Brush & Trees (0.0225)   | Unobstructed sight distance & vertical clearance. | 90 (2008 - 2012)  
85 (2007) | • No sight distance or sign obstruction  
• Vertical clearance of 15’ over roadway and shoulder to 10’ back of ditch or shoulder point or clear recovery area, whichever is further from the edge of roadway  
• No dead trees, or leaning trees that present a hazard.  
• A clear distance of 5’ behind guardrail  
• Must follow IRVM program as established by NRVMA & as adopted by NCDOT.  
• No excessive “brown-out”, pre-approval of herbicides from the Engineer required |
|------------------------------------------|---------------------------------|-----------------------------------|
| **•** Unpaved shoulders, slopes, and ditch lines free of bare, dead, diseased, distressed, or weedy areas  
**•** NCDOT approved species and seed mixes  
**•** Must follow IRVM program as established by NRVMA & as adopted by NCDOT  
**•** *** Deleted bullet ***  
**•** No excessive “brown-out”, pre-approval of herbicides from Division Roadside Environmental Engineer required |

<table>
<thead>
<tr>
<th>Uncontrolled Growth at Signs and Guardrail/Cable Guiderail (0.015)</th>
<th>Grass height is neat and uniform</th>
<th>70 (2007-2012)</th>
</tr>
</thead>
</table>
| **•** Vegetation height should not exceed the bottom of the guardrail/cablerail  
**•** Vegetation around signposts should be uniform with the roadside grass height  
**•** Neatly trimmed around fixed objects, including but not limited to signs, bridge ends & guardrails  
**•** No reduced sight distance  
**•** No excessive “brown-out”, pre-approval of herbicides from Div. Roadside Engineer required |

*** Moved Debris and Road Kill Element to Table 8, Timeliness Performance Criteria ***

<table>
<thead>
<tr>
<th>Slope (0.0075)</th>
<th>Stable No erosion</th>
<th>95 (2007-2012)</th>
</tr>
</thead>
</table>
| **•** No washouts or ruts greater than 6" deep and 2 ft wide  
**•** No erosion showing a pattern that will endanger the stability of the slope creating an unsafe recovery area |

<table>
<thead>
<tr>
<th>Litter (0.0375)</th>
<th>Neat Attractive</th>
<th>90 (2007-2012)</th>
</tr>
</thead>
</table>
| **•** Roadside appears neat and clean  
**•** Less than 100 pieces of fist size or larger litter/debris within 0.2 miles  
**•** Areas of excessive unsightly litter will fall under performance criteria of debris and road kill |

*** Deleted Right-of-Way Fence from contract ***
<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>Perf. Target (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
| Pavement Markings 0.03   | Visible | 95 (2009-2012) 90 (2008) 85 (2007) | • No edgelines, centerlines, or skip lines worn, missing, or obliterated  
• Must be present, visible, and reflective at night  
• Replaced when damaged/lost during pavement repair or winter weather events, regardless of who performs the snow and ice removal |
| Words and Symbols 0.0075 | Visible | 95 (2009-2012) 90 (2008) 85 (2007) | • Must be present, visible, and reflective at night  
• Replaced when damaged/lost during pavement repair or winter weather events, regardless of who performs the snow and ice removal |
| Pavement Markers 0.015   | Present and Reflective | 95 (2009-2012) 90 (2008) 85 (2007) | • Markers must be present and reflective at night  
• Replaced when damaged/lost during pavement repair or winter weather events, regardless of who performs the snow and ice removal  
• All lenses replaced or installed if missing or non-functional |
| Overhead Signs 0.0375    | Present, visible, legible, and reflective | 92 (2007-2012) | • Clean and flush debris from and around the base support areas  
• Clean and lubricate anchor bolts and nuts  
• Criteria also applies to any sign that the Department may install within the contract period(s) |
| Other Signs 0.0195       | Present, visible, legible, and reflective | 92 (2007-2012) | • Signs must be visible and legible at night  
• Contractor to respond to all failures due to incidents, accidents, etc., and includes site mitigation/other repairs  
• No damaged signs  
• Criteria also applies to any sign that the Department may install within the contract period(s) |
| Overhead Sign Lighting 0.0075 | Present Functional Sound Clear & Clean | 90 (2007-2012) | • Lighting must be operational at night  
• Contractor to replace defective lighting upon notification or discovery  
• Contractor is responsible for all components above the concrete footing |
| Roadway, Bridge, and Interchange Lighting (0.03) | Operational | 90 (2007-2012) | • Lighting must be operational at night  
• Contractor to replace defective lighting upon notification or discovery  
• Contractor is responsible for all components above the concrete footing |

• No sight distance or sign obstructions.  
• No missing posts delineators, or object markers |

*** Deleted Glare Screens ***
## TABLE 6
### PAVEMENT (0.2)

<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
| Paved Shoulders (0.02)   | Safe, smooth          | 90 (2007-2012)  | • Pavement failures are repaired with permanent patches in kind (asphalt with asphalt, concrete with concrete) as soon as weather conditions permit.  
• Rumble strips are retained or replaced when damaged.  
• Longitudinal joint separation is <0.5” or is sealed.  
• No unsealed cracks in asphalt shoulders larger than 0.5”  
• Cross section allows drainage from mainline (no shoulder buildup). No vegetation present. |
| Asphalt Pavement Repair (0.09) | Safe, durable, smooth | 95 (2007-2012)  | • Potholes are fixed with permanent patches as soon as weather conditions permit. Patching is done in a manner than maintains or improves the ride quality.  
• Rut depths > 0.75” are reduced to <0.25”.  
• No unsealed cracks larger than 0.5”. |
| Concrete Pavement Repair (0.09) | Safe, durable, smooth | 95 (2007-2012)  | • CRC punchouts: Permanent patches with concrete and restoration of reinforcing steel as soon as weather conditions permit. Patching is done in a manner than maintains or improves the ride quality.  
• Jointed PCC: No slabs broken in more than 3 pieces. Permanent concrete patches as soon as weather conditions permit. Patching is done in a manner than maintains or improves the ride quality.  
• Corner breaks and spalls are patched with asphalt surface course or concrete. Patching is done in a manner than maintains or improves the ride quality.  
• Cracks in slabs broken into 2 or 3 pieces are sealed.  
• In the event that movement is evident, the slab must be repaired or replaced regardless of the number of pieces the slab is broken into. |
### TABLE 7
**BRIDGE MAINTENANCE (0.15)**

<table>
<thead>
<tr>
<th>ELEMENT (ELEMENT WEIGHT)</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
  - The deck is free of foreign material (grass, stones, limbs, trash, etc.)  
  - Riding surface has no spalls ≥ 2 inches deep.  
  - Joints are clean and joint material is present and functioning as designed.  
  - Drainage system (drains, scuppers, trough, etc) is clean and functioning as designed. Railings are intact and connections are tight.  
  - Routes receiving de-icing salts, each deck shall be washed after the last snow fall has melted. |
| Bridge Superstructure² (0.045) | Safe Clean Functional | 90 (2009-2012) 85 (2008) 80 (2007) | - Perform all routine/ordinary maintenance including sweeping, washing, clearing of all obstructions.  
  - No damage by vehicular impact is evident.  
  - Bridge components are free of damaging vegetation.  
  - Bearing assemblies are clean and lubricated.  
  - The bearing assemblies and the end 5 feet of longitudinal superstructure elements are free of foreign material (grass, stones, limbs, trash, sand, dirt, etc.)  
  - Bearing assemblies and the end 5 feet of longitudinal superstructure elements shall be washed after the last snow fall has melted. |
| Bridge Substructure³ (0.045) | Safe Clean Functional | 90 (2009-2012) 85 (2008) 80 (2007) | - Perform all routine/ordinary maintenance including sweeping, washing, clearing of all obstructions.  
  - No damage (≥2” deep spalls) caused by vehicular impact is evident.  
  - Bridge components are free of damaging vegetation.  
  - Horizontal surfaces to including bridge seats and bearing areas are free of foreign material (grass, stones, limbs, trash, sand, dirt, etc.)  
  - Horizontal surfaces including bridge seats/bearing areas washed after the last snow fall has melted.  
  - Weep holes are clean and free of foreign material and properly functioning. |

¹ Bridge Deck includes and not limited to the bridge roadway surface, approach slabs, curbs, sidewalks, parapets, railing system, drainage system, lighting, expansion joints  
² Bridge Superstructure includes and not limited to beams, girders, diaphragms, bracings, truss members, bearing devices  
³ Bridge Substructure includes and not limited to abutments, backwalls, seats, piers, columns, wingwalls, Weep holes
<table>
<thead>
<tr>
<th>Component</th>
<th>Criteria</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pipes and Culverts (≥54&quot;) (0.0225)</td>
<td>Safe, Clean, Functional, Stable</td>
<td>90 (2007-2012) • Perform all routine/ordinary maintenance. • Opening ≥ 75% open. • Free of debris and vegetation. • Any erosion and scour at inlet and outlet ends has been stabilized. • End walls/wing-walls are clear of vegetation and debris. • Concrete elements have no spalls ≥ 2 inches deep. • Weep holes are clean and free of foreign material and properly functioning. • There are no construction joints opened greater than ¼ inch.</td>
</tr>
<tr>
<td>Retaining Walls (0.0075)</td>
<td>Safe, Clean, Functional, Stable</td>
<td>90 (2007-2012) • Perform all routine/ordinary maintenance. • Concrete elements have no spalls ≥ 2 inches deep. • Weep holes are clean and free of foreign material and properly functioning. Free of vegetation.</td>
</tr>
<tr>
<td>Channel and Slope Protection (0.0075)</td>
<td>Safe, Clean, Functional, Stable</td>
<td>90 (2007-2012) • Perform all routine/ordinary maintenance to include removing channel drift, stabilizing, erosion, cutting, removing and disposing of vegetation, brush and trees that are on, adjacent to, or under bridges. • Maintain bridge slope protection as designed. • Drainage systems are clean and functioning as designed. • Channel and/or Slope Protection components are free of vegetation. • Any erosion and/or scour has been stabilized.</td>
</tr>
</tbody>
</table>
### TABLE 8

**TIMELINESS PERFORMANCE CRITERIA**

<table>
<thead>
<tr>
<th>General terms and conditions ELEMENT</th>
<th>OUTCOME</th>
<th>PERF. TARGET (%)</th>
<th>TOLERANCE &amp; CRITERIA</th>
</tr>
</thead>
</table>
| Debris/Road Kill Removal & Litter Removal as directed by DOT or other customers | Roadway free of obstruction Litter Free | 100 (2007-2012) | • Respond immediately upon notification or discovery  
• Road kill and Debris promptly and properly disposed  
• Litter complaints from public or notification from Department personnel addressed promptly and thoroughly |
| Customer Response | Timely Efficient Effective Productive Follow-up | 100 (2007-2012) | • The Contractor shall contact the customer within 48 hours following initial customer inquiry.  
• All work resulting from customer requests should be scheduled within 48 hours of customer contact.  
• The Contractor shall conduct follow-up contact with the customer within 72 hours of initial inquiry.  
• All customer concerns/requests must be resolved to the Department’s satisfaction within 2 weeks of the initial inquiry. |
| Pavement Repairs | Timely Efficient Effective Productive Durable Safe | 100 (2007-2012) | • All shoulder failures >1 sq ft x 1.5”, all asphalt pavement potholes or failures greater than 1 sq ft x 1.5”, all CRC punchouts, and all concrete slabs broken into 4 or more pieces are repaired in a temporary manner within 2 days of notification or discovery.  
• All shoulder failures >1 sq ft x 1.5”, all asphalt pavement potholes or failures greater than 1 sq ft x 1.5”, all CRC punchouts, and all concrete slabs broken into 4 or more pieces, and slabs with movement are repaired in a permanent manner within 60 days of notification or discovery. |
| Guardrail/Guiderail/Impact Attenuators | Timely Efficient Effective Safe | 100 (2007-2012) | • Damaged impact attenuators and damaged, non-functional guardrail, and guiderail must be repaired within 7 days following notification or discovery.  
• Damaged impact attenuators must be replaced within 30 days following notification or discovery.  
• Damaged but functional guardrail must be repaired/replaced within 30 days following notification or discovery. |
| Signs                          | Timely Efficient Effective Safe | 100 (2007-2012) | • Damaged overhead signs and sign structures that pose imminent risk to the public must be mitigated immediately.  
• Damaged but functional overhead signs repaired/replaced within 60 days following notification or discovery.  
• Non-functional Stop, Do Not Enter, Wrong Way and Yield signs must be repaired/replaced within 8 hours following notification or discovery.  
• All other signs, including posts, that are damaged or missing must be repaired/replaced within five (5) days following notification or discovery. |

| Frozen Inclement Weather Pavement Management Winter Weather Events | Open Free of frozen precipitation Safe | 100 (2007-2012) | • At least one travel lane in each direction shall be kept open and free of frozen precipitation so that traffic can proceed in a safe and orderly manner throughout the inclement weather occurrence  
• Frozen precipitation removal activities shall continue in full force from the onset of a snow or ice event until such time as all pavement travel lanes are clear and passable (icy spots allowed) by no later than 12 hours after the end of a winter weather event.  
• Frozen precipitation removal activities shall continue in full force from the onset of a snow or ice event until such time as all pavement travel lanes are 100% free of frozen precipitation and any other frozen accumulations by no later than 24 hours after the end of a winter weather event.  
• All shoulders shall be plowed (pushed back) within 36 hours of the cessation of falling precipitation. |

| Emergency Maintenance Repairs | Timely Efficient Effective Safe | 100 (2007-2012) | • The Contractor shall initiate corrective measures within 2 hours after notification or discovery, liquidated damages in the amount of $5,000 per hour, or portion thereof, will be deducted from the monies due to the Contractor. |
### SUMMARY OF PERFORMANCE MEASURES

![Image of a page from a document with tables and text]

### EXAMPLE OF CONTRACTOR PAYMENT

- Monthly Bid Amount: $100,000.00
- Unit Price Bid: $100,000.00
- Element Value Bid: $50,000.00

#### LEVEL 1 PERFORMANCE RATING

<table>
<thead>
<tr>
<th>ELEMENT</th>
<th>TARGET POINTS</th>
<th>ELEMENT WEIGHT</th>
<th>UNIT PRICE BID</th>
<th>ELEMENT VALUE</th>
<th>PERFORMANCE RATING</th>
<th>ELEMENT PAYMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge Decks</td>
<td>80</td>
<td>1</td>
<td>80</td>
<td>95,77</td>
<td>1,34325</td>
<td>20.3</td>
</tr>
<tr>
<td>Superstructure</td>
<td>80</td>
<td>3.5</td>
<td>80</td>
<td>58.21</td>
<td>2.61945</td>
<td>-21.79</td>
</tr>
<tr>
<td>Substructure</td>
<td>80</td>
<td>7.5</td>
<td>80</td>
<td>74.92</td>
<td>3.36645</td>
<td>6.53</td>
</tr>
<tr>
<td>Pipes &amp; Culverts</td>
<td>90</td>
<td>2.04</td>
<td>90</td>
<td>27.28</td>
<td>1.061775</td>
<td>-42.81</td>
</tr>
<tr>
<td>Retaining Walls</td>
<td>90</td>
<td>0.675</td>
<td>90</td>
<td>99.87</td>
<td>0.675</td>
<td>0</td>
</tr>
<tr>
<td>Channel &amp; Slope Protection</td>
<td>90</td>
<td>0.675</td>
<td>90</td>
<td>62.95</td>
<td>0.4707</td>
<td>-27.31</td>
</tr>
</tbody>
</table>

#### LEVEL 2 PERFORMANCE RATING

- Contractor Rating: 87.69
- Element Target: 89.01
- Element Weight: 0.15

The contractor receives payment in the amount of 50% of the element value. If the performance rating is over 10 points below the performance target then the contractor does not receive payment for the element.

#### SUMMARY

- Monthly Contract Payment: $9,000.00
- Performance Payment: $9,000.00
- Overall Contractor Performance: 76.27
- Available Monthly Payment: $100,000.00

The Monthly Contract Payment is the total of the element values based on the contractor's performance ratings for each element and the applicable element value. In this example, the contractor's rating was above or at the performance target on the Retaining Wall, Paved Shoulder Condition, Low Shoulder, High Shoulder, Lateral Ditches, Crossline Pipe (Blocked), Crossline Pipe (Damaged), C&G (Blocked), C&G (Damaged), Inlet's etc. (Damaged), Guardrail/Cablerail, Median Barrier, Surf Condition, Uncontrolled Growth, Slope, Pavement Markings, and Pavement Markers elements. In this case, the contractor receives payment for the entire element value. The contractor was between 1 to 5 points below the element target on the Overhead Signs and Delineators elements, therefore, the contractor receives payment for 50% of the element value for these elements. The contractor was between over 5 and less than 10 points below the element target on the Bridge Substructure, Asphalt Pavement Repair, Concrete Pavement Repair, Landscape Beds, and Ground Signs elements, therefore, the contractor receives payment for 50% of the element value for these elements. The contractor was over 10 points below the element target on the Bridge Decks, Superstructure, Pipes and Culverts, Channel and Slope Protection, Mowing, Brush and Tree Control, Litter and Debris Control, Roadway Lighting, Words & Symbols, and Sign Lighting elements, therefore, the contractor does not receive payment for any of the element value for these elements.
Exhibit B.2

NCDOT BAFO RFP vs. VDOT I-64 TAMS (#499-CH)

This matrix was put together during the research project to assist in identifying the major differences between the RFP’s of each agency.

Reference:
<table>
<thead>
<tr>
<th><strong>(1st DRAFT) MAY 27</strong></th>
<th>NCDOT : FINAL RFP for BEST AND FINAL OFFER (BAFO) Interstate Maintenance - WBS Element 40682</th>
<th>VDOT: Two-Step Invitation For Bid #499-CH I-64 Culpeper Turnkey Asset Maintenance Services Due Date: June 22, 2010</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Location</strong></td>
<td>Mecklenburg, Gaston, Cabarrus, and Cleveland</td>
<td>“...from mile marker 174.23, 1.36 miles west of the Goochland and Henrico County line, to mile marker 86.88 west bound lane and 87.19 east bound lane at the intersection of I-81 (to include the North and South bound on and off ramps).”</td>
</tr>
<tr>
<td><strong>Miles</strong></td>
<td>131 Centerline miles</td>
<td>87.35 Center lane miles and 374.6 lane miles including all ramps up to the intersection of primary and secondary route pavement edge.</td>
</tr>
<tr>
<td><strong>Routes</strong></td>
<td>I-77, I-85, I-485, &amp; I-277</td>
<td>I-64</td>
</tr>
<tr>
<td><strong>Contract Payment</strong></td>
<td>Lump Sum Monthly Payments – Adjustments measured according to level of compliance with the standards set out in the contract. More information described below.</td>
<td>Lump Sum Monthly Payments</td>
</tr>
<tr>
<td><strong>Contract Type</strong></td>
<td>Corridor (ROW)</td>
<td>Corridor (ROW)</td>
</tr>
</tbody>
</table>
| **Contract Duration**  | 5 Years  
• May 1, 2007 - April 30, 2012  
• **Renewal:** The Engineer will notify the Contractor in writing by July 1, 2011 if the contract will be renewed. | 5 Years  
Renewal:  
• The contract renewal option shall be exercisable by the Department's delivery to the Contractor of written notice of its intent to renew this contract not less than 180 Days prior to expiration of the then current term. |
| **Scope of Services (Not Included)** | Exclusions which are specific to North Carolina are not listed.  
• Frontage Roads  
• Repair or maintenance of bridges over the interstate facilities caused by anything other than damage from traffic travelling on the interstates.  
• Repair or maintenance of Railroad bridges  
• Fog detection, closed circuit televisions, traffic counters, signal loops, Highway Advisory Radio (HAR) and Changeable Message Signs (CMS) and | Assets which are not included in TAMS:  
• Frontage roads  
• Environmental Sensor Stations (ESS) to include Roadway Weather Information Stations (RWIS). (electronic component only all other maintenance asset items included)  
• Traffic Counters, Highway Advisory Radio (HAR). |
Rest Area and Weigh Station Janitorial, Buildings, Equipment, and Grounds Maintenance. Mowing at rest areas to the limit of the gore areas.

- The installation and maintenance of LOGO signs, General Motorist Service signs, and informational safety signs for specific events (e.g. Lowe’s Motor Speedway).
- NCDOT will perform Bridge, Culvert, roadside Sign Structure, Over Head Sign, and High Mast Light Pole Inspection in accordance with Department Standards and Specifications. NCDOT will also perform structural analyses when, as a result of routine or incident inspection, significant section loss is observed due to deterioration or damage. Nothing in this paragraph relieves the Contractor from its responsibility to make repairs deemed necessary as a result of the inspections.
- Maintenance activities covered by a Municipal Agreement as provided by the Department.
- All activities associated with Outdoor Advertising (ODA), Selective Vegetation Removal (SVR), and requests by utility companies to control vegetation with herbicides on the highway right-of-way.
- Facilitation of Adopt a Highway segments. The expansion or continuation of this program on any facility segments in no way relieves the Contractor of satisfying the performance criteria contained in this RFP.
- Wildflower Program and beds
- Right-of-Way Fence
- Incident Management Assistance Patrols
- All White on Green Guide signs will be supplied by the Department
- Prompt Action Notices issued for bridge repairs or rehabilitation

### Scope of Services

<table>
<thead>
<tr>
<th>Perform: Routine Maintenance, minor repairs, collision damage repairs, and emergency repairs for the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shoulder and Ditches</td>
</tr>
<tr>
<td>2. Drainage</td>
</tr>
<tr>
<td>3. Roadside</td>
</tr>
<tr>
<td>4. Roadside Appurtenances</td>
</tr>
<tr>
<td>5. Traffic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perform: Asset Maintenance both Routine &amp; Preventative Maintenance and repair and replacement of assets due to deterioration, Incident, or damage for the following:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Roadway,</td>
</tr>
<tr>
<td>2. Drainage,</td>
</tr>
<tr>
<td>3. Structures (Includes Bridges)</td>
</tr>
<tr>
<td>4. Roadside,</td>
</tr>
</tbody>
</table>
5. Vegetation,
6. Traffic services,
7. Specialty items,
8. Emergency response services,
9. Incident management,
10. Severe weather activities and snow and ice operations

RFP defines assets which are within TAMS contract:

“All assets located within and including the limited access fences of the Transportation Facilities, unless otherwise stated within.” (pg. 13)

- All Weigh Station drive through and parking areas within the Transportation Facilities right of way.
- During snow and ice events, all open Safety Rest Areas’ drive thru’s (from entrance ramp through each parking area through the exit ramp of the Safety Rest Area.)
- All bridge mounted signs on the overpass of the TAMS route(s), ramps, and interchanges.
- Any and all other assets which are not specifically excluded in 4.1.3 below.
- Overpass bridges (on non-TAMS routes) over the transportation facility for emergency repairs and replacements only as a result of incidents or accidents.
- Bridge substructure elements of overpasses (on non-TAMS routes)
### Work Plans and Reports Required by Agency

**Includes particular provisions**

<table>
<thead>
<tr>
<th>Specified Software Restrictions for documents</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality Plan</td>
<td>Yes, “Quality Management Plan”</td>
</tr>
<tr>
<td></td>
<td>Submitted with proposal at bidding with Technical Proposal.</td>
</tr>
<tr>
<td></td>
<td>“Shall” incorporate procedures compatible with NCDOT’s Maintenance Management Systems (MMS).</td>
</tr>
<tr>
<td>Quality Reports</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>No required submission but DOT wants auditing access to them.</td>
</tr>
<tr>
<td></td>
<td>No required calculations by NCDOT</td>
</tr>
<tr>
<td>Annual Work Plan</td>
<td>Yes, “Annual Work Plan”</td>
</tr>
<tr>
<td></td>
<td>Submission must be “No later than thirty (30) days before the Contract Start Date and by July 1st of every year”.</td>
</tr>
<tr>
<td></td>
<td>Budget shall be incorporated into the annual work plan. “Work activities shall at a minimum be reported by asset type, activities, location/lane(s)/route/mile marker, unit of measure, quantities, county, and district.” (pg. 25 VDOT RFP)</td>
</tr>
<tr>
<td>Quarterly Report</td>
<td>Yes</td>
</tr>
</tbody>
</table>
- Not later than 5:00 pm on the Thursday prior to the start of the following week  
- Include any planned lane closures in this Work Plan. |
|---------------------------|-------------------------------------------------|------------------------------------------------------------------|
| Weekly Report (Prior Week) | No.  
- Submit not later than 5:00 pm on the Tuesday of each week.  
- Describes the prior work week. | Yes, “Weekly Work Accomplishments”  
- Submit “No later than thirty (30) days prior to the Contract Start Date and by July 1st of every year”. |
| Emergency Response Plan | Yes, “Emergency Response Plan”  
- The Contractor shall prepare and furnish to the Department for its review and approval an Emergency Response Plan within 30 days after the Notice of Award. | Yes, “Emergency Response Plan”  
- Submit “No later than thirty (30) days prior to the Contract Start Date and by July 1st of every year”. |
| Public Information Plan | Yes,  
- The Contractor shall prepare and furnish to the Department for its review and approval a draft Public Information Plan within 60 days after the Notice of Award.  
- Within 90 days after the Notice of Award, the Contractor shall coordinate with Department personnel, to finalize and implement the Public Information Plan. | Yes |
During this 90-Day period, all information regarding this contract and the services required herein shall be disseminated through the Department.

The Contractor shall attend a TIMS/511 briefing within 60 days after Notice of Award.

| Snow and Ice Removal Plan | Yes; however, it was let as a bid alternate. Department Decided not to go with this option. | Yes |

**Performance Criteria**

<table>
<thead>
<tr>
<th>Contractor Performance Assessment</th>
<th>Maintenance Condition Assessment (MCA) Program</th>
<th>Maintenance Rating Program (MRP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractor assessed on both timeliness requirements and ability to meet performance targets on various roadway components.</td>
<td>Road “Components” defined. Each component has sub-components known as “Elements”. Elements must meet specified performance criteria set out by NCDOT.</td>
<td>Asset Groups defined with each group having Asset Items. Targets set by VDOT.</td>
</tr>
</tbody>
</table>

**Nomenclature**

| TxDOT “Components” = VDOT “Asset Groups” & TxDOT “Elements” = VDOT “Asset Items” |

<table>
<thead>
<tr>
<th>Assessment Areas</th>
<th>Components are listed in far left column. Bridges, Pavement repair, etc.</th>
<th>Asset Groups</th>
<th>Asset Items</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Element</td>
<td>Element</td>
<td></td>
</tr>
<tr>
<td>Bridges</td>
<td>Bridge decks</td>
<td>Pipes and culverts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Superstructure</td>
<td>Retaining walls</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Substructure</td>
<td>Channel and slope protection</td>
<td></td>
</tr>
<tr>
<td>Pavement repair</td>
<td>Asphalt pavement repair</td>
<td>Concrete pavement repair</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Paved shoulder condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulder and ditch</td>
<td>Low shoulder</td>
<td>High shoulder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Lateral ditches</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drainage</td>
<td>Crossline pipe (blocked)</td>
<td>Crossline pipe (damaged)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Curb and gutter (blocked)</td>
<td>Curb and gutter (damaged)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drop inlets, CBs, etc. (blocked)</td>
<td>Drop inlets, CBs, etc. (damaged)</td>
<td></td>
</tr>
<tr>
<td>Roadside appurtenances</td>
<td>Guardrail–cablerail</td>
<td>Concrete median barrier</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Noise walls</td>
<td>Impact attenuators</td>
<td></td>
</tr>
<tr>
<td>Roadside</td>
<td>Mowing</td>
<td>Brush and tree control</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Turf condition</td>
<td>Litter and debris removal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Uncontrolled growth</td>
<td>Landscape beds</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Slopes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic-Intelligent transportation systems (ITS)</td>
<td>Pavement markings</td>
<td>Pavement markers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ground-mounted signs</td>
<td>Overhead signs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Roadway lighting</td>
<td>Words and symbols</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sign lighting</td>
<td>Delineators</td>
<td></td>
</tr>
</tbody>
</table>

Listed page 107 – 108 in RFP

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<table>
<thead>
<tr>
<th>Required Targets</th>
<th>Targets must be met at the overall score and element level. No specific component target was specified.</th>
<th>Targets must be met at the Asset Item and Group levels.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weighted Elements</td>
<td>Yes (see Appendix B, Exhibit 3)</td>
<td>Yes, (Attachment 6 of the RFP) “Asset Item Weighting Values and Asset Groups”</td>
</tr>
</tbody>
</table>
| Assessment Frequency | **Every 6 months**  
Beginning every January 1st and July 1st  
(Initial assessment in the first six months after start-up did not affect the contractor’s payments.)  
- NCDOT reserves the right to conduct additional assessments for elements within the “Roadside” component.  
- Contractor may request a re-evaluation of any element within Roadside that does not meet the required level of performance. Only one re-evaluation per month is allowed. | Department will conduct this evaluation within the first three (3) months of the contract execution.  
The Department will conduct up to three (3) but no less than two MRP evaluations within each twelve (12) month period of the contract term. No two (2) MRP evaluations will be conducted at a greater frequency than once every three (3) months. |
| Sampling Method | **Linear 0.2 mile segments** are chosen at a quantity which allows the department to gain a 95% confidence that the samples represent the entire project.  
- Contractor may request specific sample data within 14 calendar days after condition assessment results have been received.  
- Contractor may dispute element ratings only.  
- Must notify the Engineer within 30 days after the receipt of results. | |
| Performance Assessment Targets – Overall | **Pilot Project Used Phased Performance Targets** | |
| Required Overall MCA rating |  
- Calendar Year 2007 - 88  
- Calendar Year 2008 - 90  
- Calendar Years 2009 - 92 | Department also had phased performance targets for various elements of the contract (see Appendix B, Exhibit 2) |
Department can declare “Default of Contract” if Contractor in 4 consecutive evaluations:

- Receives an overall score which is 5 points below the set target.
- Receives an element score which is 15 points below the set target for the respective element.

<table>
<thead>
<tr>
<th>Sample Calculations for Partial Payment are Provided.</th>
<th>Yes</th>
<th>Yes, contractor must also provide calculations to prove they understand the process.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Payment</td>
<td>Contract is a Lump Sum Bid – Itemized Quantities and Unit Prices are submitted with proposal. Partial payments each month are based on each element during the previous assessment period. Partial payments will also account for any liquidated damages. Example: January 2009 thru June 2009 Partial Payments are based off the condition assessment performed in the fall of 2008.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix C

Supplemental Documents

Exhibits C.1 thru C.7
Exhibit C.1

TxDOT: Total Maintenance Specification (1993 Original Version)

This information was located at the main TxDOT website. This old specification is not longer in use by the Department for performance-based maintenance.

Reference:


Used with permission by Tammy Sims
Please Note: The following information has been extracted from the specification currently used by the Texas Department of Transportation.

SPECIAL SPECIFICATION ITEM
TOTAL MAINTENANCE AND OPERATION OF HIGHWAYS

1. Description. This Item shall govern for the complete maintenance and operation of highways, including all the existing appurtenance and future additions. This includes mainlane roadways, frontage roads, shoulders, ramps, intersections, roadsides, bridges, rest areas, picnic areas, weigh stations, traffic operations, etc. The limits of this work are more fully described on the attached plans.

2. General. It is the intent of this specification that the Contractor shall relieve the Department of all duties traditionally performed by the Department in maintaining and operating the highways. It shall be the responsibility of the Contractor to take measures to insure that they are completely aware of the traditional functions of the Department. It is anticipated that no change orders, except for contract extension, changes in governmental policy, changes in state or federal statutes, or catastrophic event emergency reimbursement as shown under Article 5.0 will be executed during the course of this contract.

   (1) Department Standards. Unless otherwise approved by the Engineer, work performed and materials used under this contract shall conform to the latest version of all Department manuals, standards, specifications, statewide special specifications, policies and procedures and their addenda. These include, but are not limited to, the following:

   o Highway Design Manual
   o Safety and Maintenance Manual
   o Maintenance Manual
   o Vegetation Management Manual
   o Traffic Control Standard Sheets Book
   o Traffic Operations Manual
   o Texas Standard Specifications for Construction of Highways, Streets and Bridges
   o Manual of Testing Procedures
   o Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD)
   o Sign Crew Field Book

   (2) Coordination. In performing work under this contract, the Contractor shall insure that proper coordination exists with cities, counties, state and local law enforcement, utilities, fire departments, and other state and federal agencies, etc.
(3) Purchasing from People with Disabilities. The Contractor shall comply with the provisions of Chapter 122 of the Texas Human Resources Code that are placed on the Department. The use of Community Rehabilitation Programs (CRP's) is outlined in this Chapter and is strongly encouraged by the Department.

Specifically, Section 122.008. Procurement at Determined Prices. states "A suitable product or service that meets applicable specifications established by the state or its political subdivisions and that is available within the time specified must be procured from a CRP at the price determined by the council to be the fair market price".

The Contractor will make a good faith effort to negotiate with CRP's and the Texas Industries for the Blind and Handicapped (TIBH) for subcontracts at a fair market price. The Department reserves the right to facilitate disputes involving subcontracts or potential subcontracts with CRP's and TIBH.

(4) Existing Contracts. Several Department contracts with CRP's will be in effect at the beginning of this contract. These existing contracts will be assigned to the Contractor with all provisions in force. It shall be the Contractor's responsibility to assume payments to the CRP's and/or TIBH. These contracts, their scope and duration are as listed in the General Notes and Specification Data Sheet(s). The Department will modify existing Routine Maintenance Contracts (RMC's) to eliminate the work planned on the highway(s) in this project and their work will be included in the scope of this contract.

(5) Reporting. The Contractor is required to have a personal computer that is capable of connecting to the Department's information systems and will report to the Department the following information:

Work Accomplished - Using the Department's Construction and Maintenance Contract System (CMCS), the Contractor shall report to the Department work accomplished and unit costs. This information should be input daily, or as approved by the Engineer. The report shall use the Department's "function codes" to categorize the work accomplished. The report will show, by reference marker, the following:

- The date(s) of the work
- Beginning and ending reference marker
- The County
- Function Code
- The quantity of work and unit cost using the units of measurement in the Department's Maintenance Management Information System (MMIS)

Highway Condition Report (HCR) - By 8:10 AM each workday and as
changes occur, the Contractor shall report weather conditions and any lane closures using the Department's HCR System.

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Condition assessments - The Contractor will be required to perform monthly condition assessments of all elements of the highway and right of way. These assessments shall be reported to the Department each month. The report shall be in an electronic format acceptable to the Department. In addition, the Contractor shall schedule and perform night inspections in accordance with Article 5.5, Performance Standards, and report findings and proposed repair schedules to the Department, within one month of inspection.

Complaints/Service Requests - The Contractor shall report monthly, on a format approved by the Department, information on any complaints or service requests received from the public, cities, counties, legislatures, etc. from the previous month. This information will include as a minimum, the following:

- The date and time of the complaint
- The location of the problem
- The nature of the complaint
- Who made the complaint
- Date and action taken to address the complaint

Accidents/Incidents - The Contractor shall report no later than the 15th of each month on a format approved by the Department, information from the previous month on any accident or incident related to work being performed by the Contractor or within a work zone including, but not limited to:

- accidents involving any Contractor or subcontractor personnel, equipment, barricades or tools;
- traffic accidents within the limits or in the vicinity of any work being performed by the Contractor or their subcontractors;
- hazardous material spills;
- any accident involving the Contractor or the traveling public that causes damage to an appurtenance or fixture on the right of way.

The information provided shall include as a minimum:

- The date and time of the accident/incident
- The location of the problem
- The nature of the problem
- All parties involved in the incident including name, address,
telephone number and their involvement (including witnesses)
o  Responsible party and insurance information
o  Action taken to address the incident
o  Documentation of traffic control in place at location.

In addition, the Contractor shall report to the Department immediately on a format acceptable to the Engineer.

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o Accidents/incidents causing multiple fatalities, numerous injuries or significant property damage resulting from fire, explosion or the release of hazardous materials which necessitates the evacuation of the immediate area, and the closing of roads, streets or highways.
o Highway accidents involving the deaths of five or more persons.
o Any accident involving a school bus which results in fatalities and/or disabling injuries.
o Any incident that causes a major highway to be closed for more than 24 hours, except for closures (maintenance, construction, etc.) where the public has been notified in advance via newspaper, radio or television announcements.
o Any incident that causes major damage to highway facilities.
o All bridge failures or closures.
o Any chain reaction accident involving more than 10 vehicles, regardless of the number of fatalities, injuries or length of time the highway is closed.

Agreements - The Contractor shall provide the Department, copies of all agreements between the Contractor and counties, cities, municipalities, sheltered workshops, prisons, etc. that are associated with the work on this contract.

(6) Traffic Signals and Illumination. The Contractor will provide maintenance and operations (including utility costs) of various traffic signals and illumination as outlined in the General Notes and Specification Data Sheet(s).

The Department has in place agreements that require various cities to maintain and operate Department signals and illumination. These agreements require the Department to reimburse the cities for this work. Some of these existing agreements will be assigned to the
Contractor with all provisions in force. It shall be the
Contractor's responsibility to assume payments to the cities for
maintenance and operation (including utility costs). In addition,
the Contractor shall continue the use of these agreements for the
life of this contract, except where new or revised agreements
indicate otherwise. These agreements, their scope, cost and
duration are as listed in the General Notes and Specification Data
Sheet(s).

During the life of this contract, should new signals or illumination
(except as noted below) be installed by the Department, the
Contractor will be responsible for their maintenance and operation
(including utility costs) for no additional compensation. New
continuous lighting illumination systems will be the responsibility
of the city unless revised agreements indicate otherwise.

3. Materials. The Contractor will furnish all materials necessary to
complete this work. The Contractor shall furnish the Engineer with
documentation indicating material compliance with Department
specifications unless otherwise approved by the Engineer.

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4. Equipment. The Contractor shall be responsible for furnishing all
equipment, tools and machinery necessary for the proper prosecution
of the work.

5. Scope of Work. Excluding only those items of work listed in Article
5, Subarticle (1), "Items Excluded from the Contract", it is the
responsibility of the Contractor to perform all work required to
maintain and operate the highway and its appurtenances. This
includes all maintenance and repair required to insure the highways
are kept in their designed and constructed or updated condition; and
all operational items of work to insure the highway functions as
intended. The Contractor should be aware that this work also
includes items such as catastrophic repair, HAZMAT cleanup and
disposal, obtaining required permits, etc.

The Contractor shall pursue claims against third parties for damage
caused to the highway or its appurtenances. The Contractor shall
also prepare the documentation in the required format to apply for
Emergency Relief Funds (ER) from the Federal Highway Administration
(FHWA) in the event of a Presidential Disaster Declaration. The
funds acquired by the Department as a result of these claims or ER
projects shall be added to the Contractor's monthly payment no later
than one (1) month following the month the funds are received.

Funds to repair major damage caused by catastrophic events not reimbursed by the FHWA or third parties will be added to the Contractor's monthly payment after the work is completed. The damage shall be of the extent that it is above and beyond normal routine or preventive maintenance and shall be a minimum of $50,000. Examples include: culverts or bridge components washing out, bridge damage that causes a road closure, major erosion, etc. The Contractor shall submit a bid for the repair cost and written approval to proceed shall be received from the Engineer prior to work commencing. The Department reserves the right to let an Emergency Contract to repair the damage.

(1) Items Excluded from the Contract. The Contractor will not be responsible for the following items only:

- Courtesy patrols
- Traffic management devices (such as cameras, changeable message signs, Automatic Vehicle Identification readers/antennae, amplifier cabinets, detectors including acoustic, Vehicle Imaging Vehicle Detection, microwave, etc.)
- Agreements, such as utility permits, driveway permits, Multiple Use Agreements, construction and maintenance agreements, and other similar type agreements.
- Logo signing

(2) Traffic Control Plans. The Contractor must perform all work in conformance with the Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD) and the Barricade and Construction Standards. Unique work situations may require the preparation of individual Traffic Control Plans (TCP's). Unless otherwise approved by the Engineer, individual TCP's shall be submitted to the Engineer for approval a minimum of 72 hours prior to use. Locations that could pose a hazard to the traveling public shall be signed and delineated using appropriate markings, such as barrels, chevrons, object markers, etc. Unless otherwise approved by the Engineer, a person who is certified by the American Traffic Safety Services Association (ATSSA) shall supervise the installation and removal of traffic control devices.

(3) Lane Closures. Except for emergencies, the Contractor will
provide a 72-hour advance notice to the Engineer of lane closures. Dates and times when lane closures will not be allowed are as listed in the General Notes and Specification Data Sheet(s). The Contractor shall keep the number of lane closures to an absolute minimum and shall keep each closure to the shortest time duration possible. Should emergencies occur, such as vehicle accidents, structural failures, etc., the Contractor shall take steps to open the roadway as soon as possible. Maximum distance of lane closures shall be no more than two (2) miles and there shall be a minimum distance of two (2) miles between lane closures. No two (2) consecutive exit or entrance ramps may be closed unless approved by the Engineer. The Engineer has the authority to deny a lane closure in the case of a special event or other public activity that would cause substantial delay to the traveling public.

(4) Public Notification. The Contractor shall furnish and install signs notifying the public that the highway is under private maintenance and operation. The sign locations, dimensions and wording are as outlined in the General Notes and Specification Data Sheet(s). The Contractor shall provide information to the Department concerning major lane closures or other information that would be of interest to the traveling public. Any information provided to the press shall be routed through the Department's Public Information Officer (PIO) in the District for release. The Contractor shall acquire and provide a toll free number so the public can notify the Contractor of complaints or service requests.

(5) Performance Standards. Listed below are performance standards, which shall be utilized by the Contractor to schedule work. The safety of the traveling public is of the utmost importance and shall take priority over any other work. Damage that could endanger the traveling public or cause further deterioration of the highway system shall be repaired as soon as possible including working nights, weekends and/or holidays, if necessary. Other work should be scheduled as soon as practical. The term "immediately", as used in the performance measures, means as soon as possible during normal working hours. The term "minimal", as used in the performance measures, means damage that does not affect the safety of the traveling public, does not cause further deterioration of the facility, does not reduce the comfort of the traveling public or is not unsightly. If work is required for which a standard is not
listed, the Engineer will establish that standard as it becomes necessary.

Each month the Department will determine if the Contractor is meeting the required standards. In addition, the Contractor shall constantly monitor the condition of the highway. If the Contractor or Engineer discovers deficient sections, the Contractor shall report to the Engineer measures that will be taken to correct the situation.

Pavement Maintenance.

Asphalt Surfaces (Travel Lanes and/or Shoulders).

- No ruts > 1/2".
- No unsealed cracks > 1/4".
- Patching, even and < 1/4" high or low.
- Ride should be smooth with no discernible dip for hump and have a score of 3.5 (2.5 for frontage roads) or more above on the Mays Meter.
- Potholes will be repaired immediately.
- Base failures shall be repaired immediately.
- No edge drop-offs > 2" and more than 50 continuous feet in length.
- No flushing allowed.

Concrete Pavement (Travel Lanes and/or Shoulders).

- No unsealed cracks > 1/4".
- No unsealed joints > 1/4" between travel lanes and shoulders.
- Ride should be smooth with no discernible dip or hump.
- Spalls or potholes will be repaired immediately unless otherwise approved by the Engineer.
- Pavement failures, punch-outs, joint failures, etc. shall be repaired within 72 hours or discovery. Temporary repairs shall be made if the failure could cause a safety-related problem.
- No edge drop-offs > 2" and more than 50 continuous feet in length.

Roadside Maintenance.

Vegetation Management.

- In urban areas as designated in the General Notes and Specification Data Sheet(s), the height of grass and weeds shall be kept between 7 inches and 18 inches.
- In rural areas as designated in the General Notes and Specification Data Sheet(s), the height of grass and weeds shall be kept between 7 inches and 30 inches.
- Spot mowing at intersections, ramps or other areas shall be
performed as needed to maintain visibility and sight distance.

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o Grass shall not be allowed to encroach into paved shoulders, main lanes, sidewalks, riprap or curbs.
o Wildflowers shall be preserved utilizing the guidelines in the mowing specifications and vegetation management manuals.

Landscaped Areas.

O All landscaped areas shall be maintained as near to their originally constructed condition as possible. Landscaped areas will be as designated in the General Notes and Specification Data Sheet(s).
o Items include but are not limited to mowing, litter pickup, irrigation system maintenance and operation, plant maintenance, pruning, insect, disease and pest control, fertilization, mulching, bed maintenance, watering, etc.

Litter and Debris Pickup.

O The right of way shall be kept in a neat condition.
o No more than 10 pieces of litter per roadside mile shall be visible traveling at speed limit.
o Dead animals that can be handled by one person shall be removed immediately upon discovery. Large animals shall be immediately removed from the paved surfaces and disposed of within 24 hours of discovery.
o Tires or tire tread shall be removed from paved surfaces immediately upon discovery.
O All litter collected by the Contractor shall become the property of the Contractor and shall be disposed of at approved solid waste site(s). Bagged litter shall be picked up and disposed of on the same day of collection.
o All vehicles used in transporting litter shall be equipped to prevent the accumulated litter from being strewn along the roadway.
o The Contractor shall immediately remove large or hazardous debris on paved surfaces.

Sweeping.

O Significant buildup of dirt, ice, rock, debris, etc. on roadways and/or bridges shall not be allowed to accumulate greater than 24 inches wide and/or 1/2 inch deep.
Shoulders, ramps, intersections and frontage roads, as shown in the General Notes and Specification Data Sheet(s), shall be vacuum swept at least once monthly.

Graffiti Removal.

- Obscene or "gang related" graffiti shall be removed immediately by a method approved by the Engineer.
- Non-obscene graffiti shall be removed within two (2) weeks of discovery.

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Picnic Areas.

- Picnic area locations will be shown in the General Notes and Specification Data Sheet(s).
- Picnic areas shall be kept clean and neat in appearance.
- It shall be the Contractor's responsibility to perform daily any needed repairs that may be noticed during the performance of this contract.
- "Lost and Found" items discovered at the picnic areas are to be forwarded to the Engineer.
- Litter should be removed from the picnic area grounds and barrels a minimum of three times a week. Litter shall not be allowed to accumulate outside of the barrels. All litter collected by the Contractor shall become the property of the Contractor and shall be disposed of at approved solid waste site(s). Bagged litter shall be picked up and disposed of on the same day of collection.
- All vehicles used in transporting litter shall be equipped to prevent the accumulated litter from being strewn along the roadway.
- The height of grass and weeds shall be kept between two inches and eight (8) inches. The Contractor will be responsible for replacement of vegetation damaged due to improper or careless mowing and trimming operations or any other reason resulting in damage or death of vegetation.
- Weeds, grass and other undesirable growth shall be removed from beds of plants and shrubs as needed. In addition, trees and shrubs shall be trimmed to create an aesthetically pleasing appearance.

Rest Areas.

- The number and location of rest areas, the number of attendants
and their duty hours shall be as designated in the General Notes and Specification Data Sheet(s).

- The rest area(s) shall be kept clean, sanitary and neat in appearance at all times. The rest area(s) shall be kept stocked with toilet paper and hand soap at all times. In addition, rest rooms shall be kept deodorized at all times.
- Any malfunction of any facility in the rest area(s) shall be considered as an emergency. The Contractor will be responsible for all major maintenance work involving items such as the electrical system, plumbing system, utility lines, hand dryers, light fixtures, lavatory fixtures and toilets, and any other major repairs necessary for operation of the rest area(s).
- Routine maintenance shall be performed to keep the rest area(s) in good condition including painting the facility, tables, arbor units, trash barrels, etc.
- Grass, trees and shrubs shall be watered during the early morning hours. Fertilizing will be done by the Contractor two (2) times a year (early Spring and in mid-Fall) at rates recommended by the manufacturer's specifications. Fertilizer shall be commercially available 13-13-13 or better or as approved by the Engineer.
- The height of grass and weeds shall be kept between two (2) inches and eight (8) inches.
- Weeds, grass and other undesirable growth shall be removed from beds of plants and shrubs as needed. In addition, trees and shrubs shall be trimmed to create an aesthetically pleasing appearance.
- The Contractor will be responsible for replacement of vegetation damaged due to improper or careless mowing and trimming operations or any other reason resulting in damage or death of vegetation.
- When required, as designated in the General Notes and Specification Data Sheet(s), operation of water and/or sewage treatment plants shall be the responsibility of the Contractor. Water and wastewater testing shall be performed as required by state and national statutes by certified operators.
- Utility costs at the rest area(s) shall be the responsibility of the Contractor.

Tree and Brush Control.

- Trees on the right of way, except in established non-mow areas,
shall be trimmed to allow mowers access. Trees and brush shall be trimmed to ensure they do not interfere with vehicles or sight distance, or inhibit the visibility of signs.

Drainage.

O Cross road and side road drainage structures shall be maintained with a maximum of 1/5 of the cross sectional area silted. They shall be maintained as originally constructed or subsequently modified condition. Any repair work performed to the structures shall be as approved by the Engineer.

O All culverts, pipes, channels, inlets, storm drain systems, ditches, etc. and their appurtenances shall be kept clear and functioning.

O Ditch or channel erosion and siltation over 12 inches shall be repaired by removing the siltation or filling erosion to bring the right of way back to the original lines and grades. Adequate sodding, seeding, fertilizer, erosion control blankets, silt fences, rock berms, etc. shall be provided to allow the area to revegetate.

Removal of Illegal Signing and Other Encroachments.

O The Contractor shall insure that all illegal signs and other encroachments are promptly removed from the right of way. This includes political signs, advertising signs, brick entrances, vehicles, etc. The Contractor shall utilize Department policy 10-18 to properly notify and collect reimbursement from owners of encroachments. Any funds collected by the Department for these activities shall be added to the Contractor's monthly payment.

Mailbox Installations.

O When requested by the public, the Contractor shall install mailboxes supplied by the residents on posts and mounting hardware that meet Department standards unless otherwise shown on the plans.

O The Contractor will work with mailbox owners to successfully remove any non-standard mailbox supports that are installed on the right of way.
Bridge Maintenance.

Overall Bridge.

O Repairs for bridge damage, whether caused by collision, natural disasters or normal deterioration shall be approved by the Engineer in writing before the work is begun, except that shoring or other temporary stabilization may be performed to stabilize a structure before the final repair method is approved by the Engineer.

O When damage to a highway bridge structure or overpass over the highway is discovered, the safety of the traveling public shall be of immediate concern. If there is any question about the ability of the structure to be maintained in a safe manner, detours shall be established immediately.

O Structurally critical conditions must be addressed immediately upon discovery.

O When damage causes lane closures, work shall progress as soon as possible to reopen the closed lane(s).

Railing.

O Repair or replace damaged bridge rail, approach guardrail, end treatments or attenuators within two days; install signs or temporary railing as appropriate immediately upon discovery.

O Damaged but functional traffic safety features will be repaired or replaced within one (1) week.

Deck.

O Spalls or damaged areas shall be repaired immediately or as approved by the Engineer.

O Drains must be clean and functional.

O Joints shall be clean and appropriately sealed.

O Loose armor joints shall be repaired immediately or as approved by the Engineer.

11-18

Superstructures.

O Steel beams should be maintained straight with minimal damage or rust.
- Steel fasteners should be in place, tight with none missing.
- Concrete beams should have minimal unrepaired damage, spalls or cracks.

Substructures.

- The columns, pilings and caps should have minimal unrepaired damage, spalls, cracks or scaling.
- Bearing assemblies should be clean and functional.
- Abutment and bent caps should be clean with minimal debris.

Channels.

- Debris that interferes with stream flow shall be removed within one (1) month after storm events.
- Vegetation, including trees and brush, that interfere with stream flow shall be removed from channels; however, vegetation protecting or stabilizing channel banks should be allowed to remain.
- Riprap protection should be maintained to its original configurations.
- Undermining or riprap failures should be repaired within two (2) months of discovery or as directed by the Engineer.

Embankments.

- Embankments shall be maintained with minimal erosion.
- Riprap (concrete slope protection) shall have all joints free from vegetation and shall be sealed.
- Slope failures shall be repaired by a method approved by the Engineer. Slopes shall approximately conform to the original cross-section and shall be revegetated.
- Retaining walls shall be maintained vertical, with drain holes clear. Reinforced earth walls shall be monitored for movement or for loss of backfill and repairs as approved by the Engineer.

Traffic Operations.

- Repair operational problems immediately (within four (4) hours of discovery).
- The signal timing and operational phasing shall be the responsibility of others.
- Inspect the highway traffic signal system a minimum of once every 12 months.
- Signal poles, controller pedestals and foundations are to be kept in alignment.
- Signal poles and controller cabinets are to be kept tight on their foundation(s) or pedestal(s).
Traffic and pedestrian signal heads are to be kept aligned and properly adjusted.

Provide alternate traffic control during a period of failure within one (1) hour of discovery.

Provide maintenance personnel trained in the maintenance of traffic signal equipment who will be available to respond to emergency calls 24 hours a day, including Saturdays, Sundays and holidays.

Provide state and local law enforcement agencies the location and respective names and telephone numbers of individuals responsible for emergency maintenance.

Document all checks and corrective actions in a separate logbook for each intersection.

Check cabinet filter a minimum of once every six (6) months and clean if necessary. Cabinet filter shall be replaced every two (2) years.

Traffic Detector Loops.

Repair operational problems within one (1) week of discovery.

Loop circuit's inductance must be > 50 and < 1,000 microhenries.

Insulation resistance must be > 50 meg ohms.

Signs (includes overhead signs).

Perform night sign inspections on six-month intervals and replace non-reflective signs within 30 days.

New signs shall be approved by the Engineer.

New signs that are necessary shall be acquired and installed on the latest standard sign mount within 30 days after approval.

Maintain all sign posts vertical with all break-away sign mounts clear of silt or other debris that could impede break-away features. Posts shall not be rusted.

All signs shall be upgraded to the latest Department standard within two (2) years after the execution of the contract.

Vegetation shall be trimmed to insure good visibility of signs.

Signs shall be replaced when more than five (5) percent of the face is damaged or vandalized.

Longitudinal placement must be appropriate for motorists at posted speed.

Lateral placement must be in accordance with Department's Sign Crew Field Book.

Replace deficient warning and regulatory signs as soon as possible upon discovery.
o Damaged "Stop", "Yield", "Do Not Enter", "One Way" and "Wrong Way" signs shall be replaced within two (2) hours of discovery.

Highway Lighting.

O A night inspection shall be performed monthly of luminaires and sign lighting and all deficiencies shall be repaired within one week after inspection.

Pavement Graphics.

O A night inspection shall be performed on pavement symbols every six months and all non-reflective markings should be repaired within one (1) month after inspection.

Pavement Markings.

O Pavement striping shall be inspected every six (6) months and all non-reflective markings shall be restriped within one (1) month after inspection.

O A minimum of 50 percent of pavement striping shall be restriped annually.

O Placement should meet the Department's TMUTCD and Pavement Marking Standard Sheets.

Raised Reflective Pavement Markers.

O Lane and center line raised pavement markers shall be removed and replaced every 12 months.

O Pavement markers shall be inspected six (6) months after initial installation and all non-reflective markings should be repaired within one (1) month after inspection.

Traffic Buttons.
O Traffic buttons shall be removed and replaced every 24 months.

Guardrail.

O Damaged guardrail that will no longer function as designed shall be repaired or replaced within one (1) week; remove debris and install warning signs immediately upon discovery.

o Damaged, but functional, guardrail shall be replaced or repaired within one (1) month after discovery.

o If, in the opinion of the Engineer, they are required for access control, the Contractor shall install new post and cable fence or guardrail.

Impact Attenuators.

O Repair or replace badly damaged impact attenuators within one (1) week, remove debris and install warning signs immediately upon discovery.

14-18

o Damaged, but functional, attenuators shall be replaced or repaired within one (1) month.

Overhead Signs.

O Repair or remove overhead sign structures that present a safety hazard immediately upon discovery.

o Replace overhead sign structures that must be replaced within 120 days upon discovery.

o Install temporary ground-mounted signs, as necessary, within two (2) days of removal of overhead sign structure.

Object Markers and Delineators.

O No more than five (5) object markers or delineators shall be defective per mile. They will be considered defective if they are not reflective, are not vertical or are missing.

Snow and Ice Control

o Roadways and bridges shall be treated for snow and ice before, during and after winter events to allow for movement of traffic.
Anti-icing or deicing chemicals shall be approved by the Engineer by October 1st of each year. Salt shall not be allowed unless approved by the Engineer.

6. Contractor Performance. If, in the opinion of the Engineer, the Contractor is not meeting the performance standards as shown in Article 5, Subarticle (5), "Performance Standards", or is not performing work according to this contract, the Department may take steps to have the work corrected. This may include the use of Emergency Contracts. Once the Contractor is notified that the Department is taking corrective action, the Contractor shall refrain from taking steps of their own. The costs associated with these measures will be deducted from any monies due the Contractor. In addition, liquidated damages in the amount of $5,000 per working day (starting with the for mentioned notification), during the work correction period, will be deducted from the amount due the Contractor.

7. Termination. This is an experimental project. If both parties to the contract agree in writing to terminate the contract, the Department shall prepare a termination agreement, and the contract shall end 30 days after the date of the last signature.

8. Measurement. This Item will be measured by the "Lump Sum", as the work progresses.

9. Payment. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for in partial payments in accordance with the following schedule, utilizing the unit price bid for "Total Maintenance and Operation of Highways". This price shall be full compensation for this work and for furnishing all labor, equipment, materials, fuel, tools and incidentals necessary to complete the work for a five-year period.

Should construction or reconstruction project(s) occur involving portions of highways covered by this contract, the Contractor shall be relieved of duties along those portions of highways for the duration of the construction project. Monthly payments to the Contractor will be reduced by an amount equal to the normal monthly payment divided by the total lane miles in the contract multiplied by the total lane miles in the construction project(s).

Payment Schedule. Monthly payments shall be made by multiplying the "Lump Sum" bid by the payment schedule percentage and deducting any
amounts as indicated above under "Contractor Performance".

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10. Contract Extension. If agreed upon in writing by both parties to the contract, the contract may be extended an additional 36 months in accordance with the following payment schedule. Either party to this contract may request a revised pay schedule for the contract extension, and if executed by change order, will replace the following:

Payment Schedule. Monthly payments shall be made by multiplying the original "Lump Sum" bid by the payment schedule percentage and deducting any amounts as indicated above under "Contractor Performance".

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Exhibit C.2

TxDOT: Routine Maintenance and Operation of Highways (Contract)

This information was located at the main TxDOT website. This specification is currently used for interstate maintenance services in Waco, Texas.

Reference:

Used with permission by Tammy Sims
SPECIAL SPECIFICATION

7569

Routine Maintenance and Operation of Highways

1. **Description.** This Item shall govern for the complete routine maintenance and operation of highways, including all the existing appurtenances and future additions. This includes but is not limited to, main lane roadways, frontage roads, shoulders, ramps, intersections, roadsides, bridges, picnic areas, weigh stations, traffic operations, etc. The limits of this work are more fully described on the attached plans. For this contract preventive pavement maintenance work shall be defined as full-width seal coats, micro-surfacing, mill and inlay, thin overlays, and HMAC levelups. Preventive pavement maintenance shall be performed under separate contract.

2. **General.** It is the intent of this specification that the Contractor relieve the Department of all duties traditionally performed by the Department in maintaining and operating the highway facility except as noted in this Special Specification. It shall be the responsibility of the Contractor to insure that they are completely aware of the traditional functions of the Department. Maintenance performed on additional centerline miles that are the result of new construction will be paid in accordance with this specification.

   (1) **Department Standards.** Unless otherwise approved by the Engineer, work performed and materials used under this contract shall conform to the latest version of all Department manuals, standards, specifications, statewide special specifications, statewide special provisions, policies and procedures and their addenda. These include, but are not limited to, the following:

   (a) Roadway Design Manual

   (b) Maintenance Manual

   (c) Vegetation Management Manual

   (d) Traffic Control Standard Sheets Book

   (e) Traffic Operations Manual

   (f) Texas Standard Specifications for Construction of Highways, Streets and Bridges; 2004 and applicable Special Provisions and Special Specifications

   (g) Manual of Testing Procedures

   (h) Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD)

   (i) Sign Crew Field Book.
(j) Utility Accommodation Policy
(m) Highway Condition Report (HCR) Manual
(n) Departmental Material Specifications (DMS)
(o) Material Producer List
(p) TxDOT Standard Sheets
(q) TxDOT Seal Coat Manual
(r) Public Assistance Guide FEMA 322
(s) Emergency Relief Manual FHWA

(2) **Coordination.** In performing work under this contract, the Contractor shall insure that proper coordination exists with other Contractors, cities, counties, state and local law enforcement, utilities, fire departments, health services and other state and federal agencies, etc.

(3) **Purchasing from People with Disabilities.** The Contractor shall comply with the provisions of Chapter 122 of the Texas Human Resources Code that are placed on the Department. The use of Community Rehabilitation Programs (CRP's) is outlined in this Chapter. Specifically, Section 122.008. “Procurement at Determined Prices” states "A suitable product or service that meets applicable specifications established by the state or its political subdivisions and that is available within the time specified must be procured from a CRP at the price determined by the council to be the fair market price." The Department reserves the right to mediate disputes involving subcontracts or potential subcontracts with CRP's and central non-profit agencies (CNA) such as TIBH Industries.

(4) **Existing Agreements.** The Department will provide copies of Municipal Maintenance Agreements, Lighting Agreements, Traffic Signal Agreements, and other agreements concerning the highways included in this contract. The Contractor will assume the Department’s maintenance responsibilities.

(5) **Reporting.** The Contractor is required to have a personal computer that is capable of connecting to the Department's information systems and will report to the Department the following information.

(a) **Work Accomplished.** Using the Department's Construction and Maintenance Contract System (CMCS), the Contractor shall report to the Department work accomplished and unit costs. This information should be input monthly. The report shall use the Department's "function codes" to categorize the work accomplished. The report will show, by reference marker, the following:
1. The date(s) of the work;
2. Roadway
3. Beginning and ending reference marker
4. The County
5. Function Code
6. The quantity of work and unit cost using the units of measurement in the Department's Maintenance Management Information System (MMIS)

(b) Highway Condition Report (HCR). By 8:10 AM each workday and as inclement weather or highway conditions change, the Contractor shall locally input any lane closures related to this contract, into the Department's HCR System.

(c) Contractor Condition Assessments. The Contractor shall perform monthly condition assessments of all elements of the highway and rights-of-way.

   Night Inspections. The Contractor shall schedule and perform night inspections in accordance with Section 5.(9), “Performance Standards”.

   The Contractor shall report findings and proposed repair schedules to the Department, within one week of inspection.

(d) Bridge Inspections. The Contractor shall perform visual bridge inspections on a weekly basis to monitor the bridges for needed repairs and damage caused by over-height loads, other vehicular accident damage or other damage caused by settlement, deterioration or natural causes.

   1. The Department will perform yearly inspection of bridges
   2. Inspection reports will be provided to the Contractor and may indicate needed maintenance work.

   Bridge Repairs shall be made in accordance with the Performance Standards included in this specification.

(e) Work Schedules and Plans. The Contractor shall submit 1 month work schedules, 6 month and 1 year work plans for approval by the Engineer. These schedules and plans should include all scheduled work in the time period and should be on a form as directed or approved by the Engineer. Work plans shall include all work identified in monthly condition assessment reports, night inspections, bridge inspections, work directed by the Engineer and appropriate public service requests or complaints.

(f) Complaints/Service Requests. The Contractor shall report monthly, on a format approved by the Engineer, information on any complaints or service requests received from the public, cities, counties, etc. from the previous month.
A complaint is defined as an oral, written or electronic statement concerning a matter in which the Contractor or TxDOT has authority to resolve. This information will include as a minimum, the following:

1. The date and time of the complaint;
2. The location of the problem;
3. The nature of the complaint;
4. Who made the complaint; and
5. Date, time and action taken to address the complaint.

Any legislative contact shall be immediately directed to the Director of Maintenance for response.

(g) Accidents/Incidents. The Contractor shall report no later than the 15th of each month (except as shown in (g) 4 below) on a format approved by the Department, information from the previous month on any accident or incident related to work being performed by the Contractor, incidents where the Contractor is called to perform traffic control, clean up or damage repair; including, but not limited to:

1. Accidents involving any Contractor or subcontractor personnel, equipment, barricades or tools;
2. Traffic accidents within the limits or in the vicinity of any work being performed by the Contractor or their subcontractors; or
3. Any accident involving the Contractor or the traveling public that causes damage to an appurtenance or fixture on the right of way.

The information provided shall include as a minimum:

a. The date and time of the accident/incident;

b. The location of the problem;

c. The nature of the problem;

d. Digital photographs of traffic control items, accident/incident scene, damaged highway features, etc.

e. All parties involved in the incident including name, address, telephone number and their involvement (including witnesses);

f. Responsible party and insurance information;

g. Action taken to address the incident; and

h. Documentation of traffic control in place at location.
4. The Contractor shall report to the Department immediately on a format acceptable to the Engineer:
   
a. Accidents in which there are five or more deaths.

b. Accidents with ten or more vehicles involved in a chain reaction collision.

c. Accidents involving a school bus incident resulting in one or more fatalities and/or disabling injuries. Disabling is defined as any accident that requires the injured to be taken to the hospital.

d. Accidents in which there is major damage to a highway facility.

e. Accidents involving a commercial vehicle incident with extensive property damage, etc.

f. Accidents causing deaths and/or disabling injuries to workers and/or the public.

g. Accidents that result in a road closure that lasts 8 hours or more.

h. Accidents that cause an evacuation. Evacuation is defined as the requirement to remove people from near the scene of the accident to protect them from hazardous material or endangerment from fire or other dangers that may be caused by the result of the accident.

i. Accidents creating significant media interest. If there are any questions from the media the contractor shall call the Department’s contract manager (telephone numbers will be furnished the contractor) to discuss the accident and the need for reporting.

(h) Agreements. The Contractor shall provide the Department, copies of all agreements between the Contractor and counties, cities, municipalities, CRPs, etc. that are associated with the work on this contract.

(6) Traffic Signals and Illumination. The Contractor will provide maintenance and operation excluding utility costs of traffic signals and illumination as shown on the plans and in accordance with the conditions of the agreements.

The Department may have in place agreements with cities for the maintenance and operation of signals and illumination. The scope and duration of these agreements are as listed in the plans. The obligations of the Department concerning these agreements will become the responsibility of the Contractor. Where the Department pays the city for maintenance or utility costs, the Department will continue to make the payments.

In accordance with existing agreements for maintenance of continuous illumination in cities with a population greater than 50,000; the Contractor shall submit invoices for reimbursement to TxDOT. Invoices shall include the actual incurred costs in performing maintenance work and all supporting documentation such as material invoices, labor and equipment. Invoices shall be submitted to TxDOT by the 15th calendar day of the month for the preceding month’s maintenance.
TxDOT will review the invoice and submit the invoice to the cities for reimbursement. Payments will be made to TxDOT and those funds acquired by the Department shall be added to the Contractor’s monthly payment no later than one (1) month following the month the funds are collected.

During the life of this contract, should new signals or illumination be installed by the Department or others, the Contractor will be responsible for their maintenance and operation for no additional compensation. New continuous illumination systems will be the responsibility of the city in cities with a population greater than or equal to 50,000 according to the latest federal census. New continuous illumination in unincorporated areas or through incorporated areas with municipal populations of less than 50,000 people will be the responsibility of the Contractor for no additional compensation.

3. **Materials.** The Contractor will furnish all materials with the exception of roadway illumination poles and traffic signal poles necessary to complete the work. The Contractor shall furnish the Engineer with documentation indicating material compliance with Department specifications. If written permission is granted by the Engineer, new innovative materials may be used. Failures will be the responsibility of the Contractor.

4. **Equipment.** The Contractor shall be responsible for furnishing all equipment, tools and machinery necessary for the proper prosecution of the work.

5. **Scope of Work.** Excluding only those items of work listed in Section 6.(5), "Items Excluded from the Contract," it is the responsibility of the Contractor to perform all work required to maintain and operate the highway and its appurtenances. This includes all maintenance and repair required to insure the highways are kept in their designed and constructed or updated condition; and all operational items of work to insure the highway functions as intended. The Contractor should be aware that this work also includes items such as incident management, cleanup of spilled cargo, catastrophic repair, and obtaining required permits, etc.

(1) **Damage Caused by Others.** Contractor is responsible for repair of damage to existing facilities caused by others. Repair of damage to existing facilities includes repair of damage caused by others, traffic control required to repair damage, and traffic control required for incident management. Repairs shall be completed in accordance with performance standards stated in Section 5, Performance Standards. The Contractor shall document damage claims in accordance with the Department’s Financial Management Policy Manual. Documentation shall include photographs, complete incident report and repair invoice. Repair invoice(s) shall include actual incurred repair cost and supporting documentation such as material invoices, time sheets, documentation of traffic control in place at location, and other documents as required by the Engineer. Invoices may include labor and equipment used for incident management including the Incident Scene Commander, the actual labor, equipment, and material required for repair of damage.

Repair of damage caused by others will not be considered as extra work. Invoices shall not include overhead, profit, emergency response fees, markups, bond, and insurance. Routine inspection for possible damage shall not be considered for reimbursement.
The Contractor shall submit all required documentation to the Department for approval within 60 days after the completion of repairs. The actual repair costs shall be submitted in a format approved by the Engineer and signed and certified correct by the Contractor’s Project Manager. Damage claims submitted with incomplete documentation will be returned to the Contractor.

Contractor shall be reimbursed costs for repair of damaged caused by others on the monthly payment no later than 1 month following the month the claim is approved.

(2) **Emergency Relief Funds.** For costs expended by the Contractor, prepare the documentation in the required format to apply for Emergency Relief Funds (ER) from the Federal Highway Administration (FHWA) in the event of a Governor’s Proclamation of an emergency. The funds acquired by the Department as a result of these ER projects less the Department’s expense, shall be added to the Contractor’s monthly payment no later than 1 month following the month the funds are received.

(3) **Catastrophic Damage.** In the event that major damage caused by a catastrophic event should occur, the Contractor shall be responsible for the first $50,000 of actual incurred cost per event not reimbursed by the FHWA or third parties. Contractor shall prepare necessary documentation in the required format to apply for funds from FHWA. Catastrophic event is defined as a failure of a major element or segment of a Federal road that is due to an external cause and not attributable to gradual and progressive deterioration or lack of proper maintenance. Any amount over $50,000 will be added to the Contractor’s monthly payment after the work is completed. The Contractor shall submit a bid for the repair cost and written approval to proceed shall be received from the Engineer prior to work commencing. The Department reserves the right to reject the Contractor’s proposal and perform the work by state forces or other contract. In the event the Department exercises this option, the Contractor shall be responsible for the first $50,000 per event. Examples of catastrophic damage include bridges or culverts washed out by isolated flooding, damage caused by third parties where the third party is not identified, etc.

(4) **Maintenance in Construction Work Zone Limits.** Contractor shall perform snow and ice response and incident management in construction work zones. Snow and Ice Control shall be in accordance with Special Specification “Snow and Ice”. Contractor shall maintain traffic signals and illumination that are not included as a part of the construction project.

**New Construction Lane Miles.** Once construction or reconstruction project(s) are completed or partially accepted for maintenance, the Contractor shall resume duties along those portions of the highway for the remainder of the contract. .

The Contractor will be given opportunity to provide a punch list on construction projects prior to the acceptance of the construction project.

(5) **Items Excluded from the Contract.** The Contractor will not be responsible for the following items:
a. Roadside Assistance (Courtesy Patrol)
b. ITS Cameras
c. Executing Agreements, such as utility permits, driveway permits, Multiple Use Agreements, construction and maintenance agreements, and other similar type agreements;
d. Logo signing;
e. Rest Areas;
f. Dynamic Message Signs;
g. Removal and disposal of hazardous materials and hazardous material spills

(6) Traffic Control Plans. The Contractor shall perform all work in conformance with the latest versions of the Texas Manual on Uniform Traffic Control Devices for Streets and Highways (TMUTCD), Barricade and Construction (BC) Standards and the Traffic Control Standard Sheets. Unique work situations may require the preparation of individual Traffic Control Plans (TCPs). Unless otherwise approved by the Engineer, individual TCPs signed and sealed by a professional Engineer licensed in Texas, shall be submitted to the Engineer for approval a minimum of 72 hours prior to use. Locations that could pose a hazard to the traveling public shall be signed and delineated using appropriate traffic control devices, such as barrels, cones, etc. A person who is certified by ATSSA or the Texas Engineering Extension Service (TEEX) shall supervise the installation and removal of traffic control devices. Flaggers shall have “Flagger In Work Zones” training. Provide certification documentation to the Department every 12 months or as changes are made.

Portable changeable message signs (PCMS) and vehicle mounted portable changeable message signs shall be full matrix LED message boards.

(7) Performance Standards. Listed below are performance standards, which shall be utilized by the Contractor to schedule and perform the work. The safety of the traveling public is of the utmost importance and shall take priority over any other work. Damage that could endanger the traveling public or cause further deterioration of the highway system shall be repaired immediately which may include working nights, weekends and/or holidays. Other work should be scheduled as soon as possible.

Days listed in the performance standards are defined as calendar days.

The term "minimal", as used in the performance measures, means damage that does not affect the safety of the traveling public, does not cause further deterioration of the facility, does not reduce the comfort of the traveling public or is not unsightly. If work is required for which a standard is not listed, the Engineer will establish that standard as it becomes necessary.

The Department will inspect the work. If work identified by the Department or in the monthly work schedule is not performed in a timely manner, the Contractor will be assessed charges as outlined in 6.(1). These same charges may be assessed if in the opinion of the Engineer, work is delayed because the Contractor is not expediently procuring materials.
(a) **Routine Pavement Maintenance.** If, in the opinion of the Engineer, the Contractor fails to perform routine maintenance, resulting in further deterioration of the pavement resulting in major maintenance work, the Contractor will be responsible for the cost of the additional work.

**Asphalt Surfaces (Travel Lanes and/or Shoulders)**
- No unsealed cracks greater than or equal to 1/16 in. wide.
- Patching, even and < 1/4 in. high or low.
- Potholes shall be temporarily repaired immediately.
- Base failures shall be temporarily repaired immediately. Permanent repairs shall be performed within 30 days. Cutouts shall be squared up.
- Bleeding pavement shall be treated in a manner satisfactory to the Engineer.
- No edge drop-offs > 2 in. deep
- No shoulders that cause water to drain back within the travel lanes.

**Concrete Pavement (Travel Lanes and/or Shoulders).**
- No unsealed joints > 1/4 in. wide.
- Spalls or potholes shall be temporarily repaired immediately. Permanent repairs shall be performed within 30 days.
- Pavement failures, punch-outs, joint failures, etc. shall be temporarily repaired immediately. Permanent repairs shall be full depth and performed within 30 days. The concrete shall be screeded to the elevation of the adjacent concrete pavement and checked with a straightedge to ensure the riding surface will be satisfactory. Cutouts shall be squared up.
- No edge drop-offs > 2 in. deep.

**Sweeping.**
- Significant buildup of dirt, ice rock, debris, etc. on roadways and/or bridges shall not be allowed to accumulate greater than 24 in. wide and/or 1/2 in. deep.
- Shoulders with curbs, railings or traffic barriers, bridges, gore areas, ramps, intersections, riprap, raised islands and curbed lanes of frontage roads, as shown in the plans, shall be swept at least once monthly or as shown in the plans. Use vacuum sweeper or as approved by the Engineer.
- No sweepings shall be stockpiled on State right-of-way.

(b) **Roadside Maintenance.**

**Concrete Traffic Barrier**
- Damaged barrier shall be repaired with 10 days. Barriers shall be repaired with same material as original fabrication to provide an adjoining matched finish. Barrier shall be repaired to minimize damaged appearance.
- Barriers damaged beyond repair shall be replaced within 12 hours of being damaged. The Department will furnish new concrete traffic barrier. Barrier will be located at the Department’s yard on US 84 in Bellmead or as directed by the Engineer.
- Replacement shall be performed during off peak travel times unless otherwise directed by the Engineer.
• Barrier shall be straight and in the original alignment.

Vegetation Management
• Perform 2 Rural mow cycles. Cycles shall be completed in June and within 30 days after the first freeze or as directed by the Engineer.
• Perform 3 Urban mow cycles as directed by the Engineer. Cycles shall be completed in March, June, and within 30 days after the first freeze or as directed by the Engineer.
• Mowing cycles shall include new Right Of Way purchased for future construction projects.
• Spot mowing at intersections, ramps or other areas shall be performed as needed to maintain visibility of appurtenances and sight distance or as directed by the Engineer.
• Grass shall not be allowed to encroach into or on paved shoulders, main lanes, sidewalks, islands, riprap, traffic barrier or curbs. Chemical or mechanical edging of curbs and sidewalks will be required.
• Vegetation of any kind shall not be allowed to encroach into retaining wall joints.
• The Contractor shall utilize a herbicide program approved by the Engineer to control noxious weeds and to eliminate grass in pavement or concrete. The Contractor shall submit a plan within one month after execution of the contract for approval by the Engineer. Plan shall be updated and approved by the Engineer every year.
• Noxious weeds shall be treated before they reach 30 inches in height.
• Wildflowers shall be preserved utilizing the guidelines in the mowing specifications and vegetation management manuals.

Exit and Entrance Gore Areas
• Exit and entrance ramp gore areas shall match grades on either side of the gore area.

Landscaped Areas.
• All landscaped areas shall be maintained to their originally constructed condition.
• Landscaped areas and mowing limits are designated in the plans. All underpasses within incorporated cities shall be considered landscape areas.
• Items include but are not limited to mowing, litter pickup, irrigation system maintenance and operation, plant maintenance, pruning, insect, disease and pest control, fertilization, mulching, bed maintenance, watering, etc.
• The height of grass and weeds shall be kept between 2 in. and 8 in. Mowing shall begin before vegetation reaches 8 in.
• The Contractor shall replace any damaged or dead vegetation in a timeframe approved by the Engineer.
• Prune all trees in landscape areas including pampas grass once a year. Pruning shall be performed December thru February.
Channel Easements and Retention Ponds
- Easements and retention ponds as noted in the plans shall be included in urban mowing and litter pickup cycles.
- Ditch, channel or retention pond erosion and siltation located within ROW or drainage easements that adversely affect the drainage shall be graded to the original lines and grades. Adequate sodding, seeding, fertilizer, erosion control blankets, silt fences, rock berms, etc. shall be provided to allow the area to re-vegetate.

Litter and Debris Pickup.
- The right of way shall be kept in a neat condition.
- Litter and debris pickup shall include new Right Of Way purchased for future construction projects
- No more than 20 pieces of litter per roadside mile shall be visible when traveling at the posted highway speed.
- Dead animals that can be handled by one person shall be removed immediately upon discovery or notification. Large animals shall be immediately removed from the paved surfaces. Large animals shall be disposed of at an approved site within 24 hours of discovery or notification.
- Tires or tire tread shall be removed from paved surfaces daily upon discovery or notification
- All litter collected shall become the property of the Contractor and shall be disposed of at an approved solid waste site(s). Bagged litter shall be picked up and disposed of on the same day of collection.
- All vehicles used in transporting litter shall be equipped to prevent the accumulated litter from being strewn along the roadway.
- The Contractor shall immediately remove potentially dangerous debris.
- "Lost and Found" items are to be forwarded to the Engineer.

Graffiti Removal.
- Obscene, "gang related", or highly visible graffiti shall be removed immediately by a method approved by the Engineer.
- Graffiti that is not obscene, gang related or highly visible graffiti shall be removed within 1 week of discovery or notification by a method approved by the Engineer.
- Removal method shall be performed in a manner and include materials that restore the surface to a like appearance similar to adjoining surfaces. When painting is used as an approved method, the area painted shall be performed in an approved manner that leaves a uniform shape and appearance.

Picnic Areas.
- Trash barrels shall be painted in a manner acceptable to the Engineer and attached to their supports to prevent stealing.
- Picnic area locations will be shown in the plans.
- Picnic areas shall be kept clean and neat in appearance.
• It shall be the Contractor's responsibility to perform all needed repairs that are identified during the performance of this contract.
• "Lost and Found" items discovered at the picnic areas are to be forwarded to the Engineer.
• Litter should be removed from the picnic area grounds and barrels a minimum of 3 times a week. Litter shall not be allowed to accumulate outside of the barrels. All litter collected shall become the property of the Contractor and shall be disposed of at approved solid waste site(s).
• All vehicles used in transporting litter shall be equipped to prevent the accumulated litter from being strewn along the roadway.
• The height of grass and weeds shall be kept between 2 in. and 8 in. Mowing shall begin before vegetation reaches 8 in. The Contractor will be responsible for replacement of vegetation damaged due to improper or careless mowing and trimming operations or any other reason resulting in damage or death of vegetation.
• Weeds, grass and other undesirable growth shall be removed from beds of plants and shrubs as directed. In addition, trees and shrubs shall be trimmed to create an aesthetically pleasing appearance. All curbs and sidewalks shall be edged and repaired in a manner acceptable to the Engineer.

Tree and Brush Control.
• Trees, brush and ornamentals on the right of way shall be trimmed in accordance with Department standards to allow mowers access. Trees, brush and ornamentals shall be trimmed to insure they do not interfere with vehicles or sight distance, or inhibit the visibility of signs. Dead trees, brush, ornamentals and branches shall be removed within 3 months, unless considered to be a hazard. Potentially dangerous trees or limbs shall be removed as soon as possible.
• Prune ornamental trees and shrubs once a year. Pruning shall be performed December thru February.
• All undesirable trees and vegetation shall be removed.

Drainage
• Cross road and side road drainage structures shall be maintained with a maximum of 1/5 of the cross sectional area silted. They shall be maintained as originally constructed or subsequently modified condition. Any repair work performed to the structures shall be as approved by the Engineer.
• All culverts, pipes, channels, inlets, storm drain systems, ditches, traffic barrier drainage slots, etc. and their appurtenances shall be kept clear and functioning and free of debris, trees and brush. Any ponding on the roadway should be investigated immediately to insure drainage is functioning as designed. Any obstructions shown to cause ponding shall be removed immediately.
• Ditch or channel erosion and siltation located within ROW or drainage easements that adversely affect the drainage shall be graded to the original lines and grades. Adequate sodding, seeding, fertilizer, erosion control blankets, silt fences, rock berms, etc. shall be provided to allow the area to revegetate.
Guardrail and Cable Barrier Systems
- Damaged guardrail and cable barrier systems that will no longer function as designed shall be repaired or replaced within 7 days; remove debris and install warning signs immediately upon discovery or notification. Mow strip if damaged shall be repaired along with cable fence.
- Damaged, but functional, guardrail and cable barrier systems shall be replaced or repaired within 10 days after discovery or notification.
- If, in the opinion of the Engineer, they are required for access control, the Contractor shall install new post and cable fence.

Impact Attenuators
- Damaged impact attenuators that will no longer function as designed shall be repaired or replaced within 7 days. Remove debris and install warning signs immediately upon discovery or notification of damage.
- Inspect every 6 month and clean or adjust as necessary to ensure proper operation.
- Damaged, but functional, attenuators shall be replaced or repaired within 10 days.

Removal of Illegal Signing and Other Encroachments
- The Contractor shall insure that all illegal signs and other encroachments are promptly removed from the right of way. This includes political signs, advertising signs, brick entrances, vehicles, etc. The Contractor shall utilize Department policy to properly notify and collect reimbursement from owners of encroachments.

Mailbox Installations
- The Contractor shall install approved mailboxes supplied by the residents on posts, mounting hardware, and delineation furnished by the Contractor. Mailbox posts (supports) shall be the same type as existing. Mailboxes shall be installed within 3 days of request.
- The Contractor is responsible for coordinating with mailbox owners to remove any non-standard mailbox and/or supports that are installed on the right of way. Non-standard mailbox supports should be removed within 10 days.

(c) Bridge Maintenance.

Overall Bridge
- Structurally critical conditions must be addressed immediately upon discovery or notification.
- NBIS Evaluations shall be performed by others and sent to the contractor for maintenance work.
- Bridges and culverts shall be clear of drift and debris.
- When damage to a highway bridge structure or overpass is discovered, the safety of the traveling public shall be of immediate concern. If there is any question about the ability of the structure to function in a safe manner, detours shall be established immediately.
• When damage requires lane closures, work shall progress immediately to reopen the closed lane(s).

**Railing.**
• Repair or replace damaged bridge rail, approach guardrail within 50 feet of the bridge, end treatments or attenuators immediately to insure safety and repairs made as soon as possible; install warning signs and temporary railing as appropriate immediately upon discovery or notification or as approved by the Engineer.
• All bridge rails shall be free of rust.

**Deck.**
• Spalls or damaged areas shall be repaired immediately or as approved by the Engineer.
• Drains must be clean and functional.
• Joints shall be clean.
• Joints shall be checked with a straightedge to ensure the riding surface shall be satisfactory.
• Loose armor joints shall be repaired immediately or as approved by the Engineer.
• Contractor shall utilize the most current TxDOT Specification for repairs unless otherwise approved.

**Superstructures.**
• Steel fasteners shall be tight in place, with none missing.
• Concrete beams shall have minimal unrepaired damage, spalls or cracks.
• Contractor shall utilize the most current TxDOT Specification for repairs unless otherwise approved.

**Substructures.**
• The columns, pilings and caps shall have minimal unrepaired spalls, cracks or scaling.
• Abutment and bent caps should be clean with minimal debris.
• Contractor shall utilize the most current TxDOT Specification for repairs unless otherwise approved.

**Channels.**
• Debris that interferes with stream flow shall be removed within 30 days after storm events unless otherwise directed by the Engineer.
• Vegetation, including trees and brush, that interfere with stream flow shall be removed from channels; however, vegetation protecting or stabilizing channel banks may be allowed to remain if approved by the Engineer.
• Contractor shall obtain approval from the Engineer prior to performing work below the ordinary high water mark or other work that requires environmental approval and/or permits prior to construction. TxDOT will acquire environmental permits.
• Riprap protection should be maintained to its original configurations or modified as approved by the Engineer.
• Undermining or riprap failures should be repaired within 60 days of discovery or notification or as directed by the Engineer.

**Embankments.**
• Care should be taken, when working on the right-of-way, to avoid damaging slopes and embankments.
• Repair erosion or damage by filling to bring the right of way back to the original lines and grades.
• Riprap (concrete slope protection) shall have all joints free from vegetation.
• Slope failures shall be repaired by a method approved by the Engineer. Slopes shall approximately conform to the original cross-section and shall be revegetated.
• Retaining walls shall be maintained vertical, with drain holes clear. Reinforced earth walls shall be monitored for movement or for loss of backfill and repaired as approved by the Engineer.
• Adequate sodding, seeding, fertilizer, erosion control blankets, silt fences, rock berms, etc. shall be provided to allow repaired areas to revegetate.

(d) **Traffic Operations Maintenance**

**Signals.**
• Repair traffic signal operational problems immediately (within two hours of discovery or notification).
• Provide alternate traffic control during a period of failure within 1 hour of discovery or notification.
• Provide 1000 watt external generator(s) within 1 hour to power traffic signals at intersections during power outages predicted to last more than 2 hours. Contractor shall wire existing controller cabinets to accommodate external generators within two (2) months of beginning work on the contract.
• The signal timing and operational phasing shall be the responsibility of TxDOT or the city.
• Inspect the highway traffic signal system a minimum of once every 12 months. Inspection shall be documented on an approved TxDOT form. Inspections shall be sent to the Engineer for this review.
• Traffic signal lamps shall be LED in accordance with the latest Department Specification.
• Signal poles, controller pedestals and foundations are to be kept in alignment.
• Signal poles and controller cabinets are to be kept tight on their foundation(s) or pedestal(s).
• Replace damaged signal poles within 60 days. Use temporary measures as needed to support damaged signal poles until replaced. If inoperable, replace traffic signal controller cabinets within 1 day. Replace signal cabinets that have been damaged, but are still operable within 30 days.
• Contractor may purchase traffic signal controllers and cabinets from the Department. Cost of controller and cabinet will be deducted from the Contractors next estimate.
• Traffic and pedestrian signal heads are to be kept aligned and properly adjusted.
• Provide maintenance personnel trained in the maintenance of traffic signal equipment who will be available to respond to emergency calls 24 hours a day, including Saturdays, Sundays and holidays.
• Provide state and local law enforcement agencies the location and respective names and telephone numbers of individuals responsible for emergency maintenance.
• Document all checks and corrective actions in a separate logbook for each intersection. Logbooks shall be kept in the controller cabinet for each signalized intersection.
• Wash and/or replace controller cabinet filters every 6 months.
• Check conflict monitors and malfunction monitoring units with certified testers every 12 months.

Traffic Signal Detection
• Repair operational problems immediately upon discovery or notification.
• Inoperable traffic signal detection shall be replaced/repaired within 10 days.

Signs (includes small signs, large signs, and overhead signs).
• New signs added to the system, shall be installed by the Contractor as directed by the Engineer. Contractor shall install riprap around new or reconstructed large sign foundations as shown on Waco District Standard, “Vegetation Control Strip” or the latest Department Standard.
• The Department will provide details for all non-standard signs.
• Perform night sign inspections on six-month intervals and replace non-reflective signs within 30 days.
• When replacing large signs, replace with extruded aluminum or fiberglass signs.
• When replacing small signs, signs less than four (4) feet wide use flat aluminum, signs over four (4) feet wide use extruded aluminum or fiberglass.
• When replacing damaged or faded signs on a small sign support, all signs on the support shall be replaced to ensure consistent reflectivity and uniform appearance.
• Maintain all sign posts vertical with all break-away sign mounts clear of silt or other debris that could impede break-away features. Posts shall not be rusted.
• Signs shall be replaced when more than 5% of the face is damaged or vandalized.
• Longitudinal placement must be in accordance with SMD standard sheets.
• Lateral placement must be in accordance with Department's Sign Crew Field Book.
• Replace deficient warning and regulatory signs as soon as possible upon discovery or notification.
• Damaged "Stop," "Yield," "Do Not Enter," "One Way" and "Wrong Way" signs shall be repaired or replaced within two (2) hours of discovery or notification.
• Damaged standard small signs (with the exception of "Stop,” "Yield,” "Do Not Enter,” "One Way" and "Wrong Way") shall be repaired or replaced within 14 days.
• Damaged non-standard small signs including distance, direction, city limits, and other signs that require fabrication details shall be repaired or replaced within 30 days.
• Bridge Clearance Signs with incorrect bridge clearance shall be replaced within 7 days. Contractor shall verify clearance prior to sign fabrication.
• Damaged large signs excluding Exit Gore Signs shall be removed immediately to the ROW line or off the ROW, upon discovery or notification, and shall be repaired or replaced within 30 days. Sign faces shall be properly washed in accordance with manufacture recommendations prior to reinstallation.
• Damaged Exit Gore Signs shall be removed immediately to the ROW Line or off the ROW, upon discovery or notification. Place temporary Exit Gore Signs within 24 hours of discovery or notification. Temporary sign mounts shall be in accordance with the latest Barricades and Construction (BC) Standard Sheets. Permanent Exit Gore Sign shall be constructed with 14 days. Sign faces shall be properly washed in accordance with
• Signs warning of ice on road shall be opened in the fall and closed in the spring on a schedule as directed by the Engineer.
• Install temporary ground-mounted signs, within 10 days of removal of overhead sign structure. Sign mounts shall be in accordance with latest Barricades and Construction (BC) Standard Sheets.

Highway Lighting.
• A night inspection shall be performed monthly of luminaires (including highmast luminaires) and sign lighting and all deficiencies shall be repaired within 10 days after inspection. Contractor shall submit the monthly inspection report to the Engineer.
• Ensure 100% of access panels are present and secured.
• Non-functional lights will be repaired within 10 days of discovery or notification.
• Damaged luminaire poles shall be removed immediately upon discovery or notification, and shall be repaired or replaced within 14 days.
• Broken or damaged transformer bases shall be replaced within 14 days of discovery or notification. Bases shall meet the most current edition of AASHTO's "Standard Specifications for Structural Supports for Highway Signs, Luminaries and Traffic Signals"
• Inspect high mast lighting poles and assemblies and provide proper preventive maintenance in accordance with the TxDOT Illumination Manual. Inspection and preventive maintenance shall be performed every time the ring is lowered for any reason. Inspection and maintenance shall be documented using the Inspection Record for High Mast Lighting Pole Assembly form (TxDOT 1409) or as directed. Submit completed inspection reports to the Department.
Pavement Graphics.

- A night inspection shall be performed on pavement graphics every 6 months and all non-reflective graphics should be corrected within 30 days after inspection. Includes arrows, words, and symbols,

Striping.

- Water based paint shall not be used unless approved by the Engineer.
- Inspect pavement striping every 6 months after the contract begins using a mobile retroreflectometer in accordance with Special Specification 8094, “Mobile Retroreflectivity Data Collection for Pavement Markings” or the latest version of the specification. Restripe all markings not meeting the minimum retroreflectivity requirements shown below within 1 month after inspection. Minimum requirements:
  - White markings: 150 millicandela per square meter per lux (mcd/m²lx)
  - Yellow markings: 100 mcd/m²lx

- When restriping the roadway take a minimum of 1 retroreflectivity measurement per mile for each line in the presence of the State Inspector. Meet the following minimum retroreflectivity values for edgeline markings, centerline/no passing barrier-line, and lane lines when measured anytime after 3 days, but not later than 10 days after application:
  - White markings: 250 millicandela per square meter per lux (mcd/m²lx)
  - Yellow markings: 175 mcd/m²lx

A minimum of one measurement shall be taken per mile for each line. Markings not meeting the above minimum values shall be replaced.

- Restripe all pavement markings that have peeled or flaked away to where the marking is no longer nominal width, minus 1/2 in. and/or uniform cross section within 1 month after inspection. Restripe continuous stripe not less than 1000 ft. in any one location.

- See the Department's TMUTCD and Pavement Marking Standard Sheets for striping details.

Raised Reflective Pavement Markers (RRPM)

- Replace missing, cracked, nonreflective, or dim RRPMs every 6 months after the contract begins.
- RRPMs shall be placed using flexible bituminous as approved by the Engineer.
- All RRPMs shall be removed and replaced on the following schedule.
  - Mainlanes every year.
  - Wrong Way Arrows, Special Accent Lines, and symbols every year.
  - Frontage Roads every 2 years.
  - Gore areas every 2 years.

Overhead Sign Structures.

- Repair or remove overhead sign structures that present a safety hazard immediately upon discovery or notification.
- Replace overhead sign structures that must be replaced within 90 days upon discovery or notification. Repair or replacement of special designed overhead sign structures shall be approved by the Department prior to construction.
Object Markers and Delineators.

- No more than 5 object markers or delineators shall be defective per mile. They will be considered defective if they are not reflective, are not vertical or are missing. Use like type of delineators when replacing unless approved by the Engineer.
- Furnish a tubular post minimum of 2 inches diameter with a flat surface at least 3 inches wide and 15 inches long for delineator mounting meeting the requirements of DMS-4400. Use the Wedge Anchor Plastic System for ground mounted delineators set in concrete as shown on the Delineator and Object Marker Installation (D&OM) Standard Sheets. Submit one assembly or a material cut sheet to the Engineer for approval prior to installation.

(e) Emergency Maintenance.

Snow and Ice Control will be performed and paid for in accordance with Special Specification “Snow and Ice Control”

Incident Management and Debris in the Roadway

- Provide initial emergency traffic control within 45 minutes of notification, to close lanes as necessary for cleanup of incident. Following initial emergency setup, immediately proceed with setting up traffic control in accordance with the TMUTCD and the current Traffic Control Plan (TCP) Standard Sheets.
- Remove debris in the roadway immediately (within 45 minutes of discovery or notification).
- For any hazardous material spills, call appropriate local, state or federal governmental regulatory agency as necessary.
- The Department will remove spilled cargo to a safe location on the right-of-way as necessary to restore traffic flow.


(1) The Department will notify the Contractor of a performance standard as shown in Section 7, “Performance Standards,” that has not been met. After notification, if the Performance Standard is not met in a time frame determined by the Engineer, the Contractor will be charged penalties in accordance with the Schedule of Liquidated Damages, per item of work, per standard (including Saturdays, Sunday and holidays), until the standard is met, starting with the end of the aforementioned time frame. The costs associated with these measures will be deducted from any monies due the Contractor.

In addition, the Department may take steps to have the work corrected. This may include the use of State Forces or Emergency Contracts. Once the Contractor is notified that the Department is taking corrective action, the Contractor shall refrain from performing work on the item in question unless approved by the Engineer. The costs associated with these measures will be deducted from any monies due the Contractor.
Modified TxMAP Inspection: Also, in addition, the Department will perform random condition assessments in accordance with the Department’s Texas Maintenance Assessment Program (TxMAP) as modified in this specification no more than once a month unless the additional inspection is requested by the Contractor following an inspection with a performance below minimum standards. Each evaluation will be performed on at least 10% of the length of all roadways including frontage roads and both main lanes. Sections to be inspected will be selected randomly in approximately one mile length segments. Since the Department shall determine when pavement maintenance shall be performed, the rutting, failures, ride and shoulder elements of the pavement component shall be not be given an element score in the Modified TxMAP Condition Assessment. Likewise raised pavement markers will not be rated and will not be given a score.

Table 1 shows the required minimum standards and the reduced compensation that will be made for per month when the standards are not met.

**Table 1 Reduced Compensation**

<table>
<thead>
<tr>
<th>Payment Reduction</th>
<th>Items</th>
<th>Minimum Standard</th>
<th>Reduced compensation per month with performance below minimum standards. *</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>“Element”</td>
<td>70%</td>
<td>= $2.00 x P x LM for each Element</td>
</tr>
<tr>
<td></td>
<td>“Component”</td>
<td>80%</td>
<td>= $5.00 x P x LM for each Component</td>
</tr>
</tbody>
</table>

*Definition of Term

- P - the percentage below the minimum standard
- LM - total lane miles in the total project
- x - multiplication sign

The elements, components and the overall items are listed on the inspection form that follows. Descriptions of how these items are rated and examples calculations of values area also shown.

The average values for elements, components, and overall results of the last Modified TxMAP evaluation will be shown in the plans. For any element, component, or the overall average shown in the plans that meets minimum standards in Table 1 the Contractor will be required to meet the standards in Table 1 from the start of the contract.

If the overall score shown in the plans is below the value in Table 1 the Contractor will be given 6 months to bring the overall score up to standards shown in Table 1.

If the components scores shown in the plans are below the value in Table 1 the Contractor will be given the time listed in Table 2 to bring the components up to standards in Table 1.
Table 2 Components

<table>
<thead>
<tr>
<th>Components</th>
<th>Time Allotted at the beginning of contract to bring Modified TxMAP scores up to minimum standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement</td>
<td>4 months</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>4 months</td>
</tr>
<tr>
<td>Roadside</td>
<td>3 months</td>
</tr>
</tbody>
</table>

If the component elements scores shown in the plans of the last inspection are below the values shown in Table 1, the Contractor will be given the time listed in Table 3 to bring the elements up to the standard in Table 1.

Table 3 Elements

<table>
<thead>
<tr>
<th>Component</th>
<th>Component Element</th>
<th>Time Allotted at the beginning of contract to bring Modified TxMAP scores up to minimum standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement</td>
<td>Main Lane – Cracking</td>
<td>4 months</td>
</tr>
<tr>
<td></td>
<td>Edges</td>
<td>2 months</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>Raised Pavement Markers</td>
<td>4 months</td>
</tr>
<tr>
<td></td>
<td>Signs – Large</td>
<td>2 months</td>
</tr>
<tr>
<td></td>
<td>Signs – Small</td>
<td>2 months</td>
</tr>
<tr>
<td></td>
<td>Striping, Pavement Graphics</td>
<td>4 months</td>
</tr>
<tr>
<td></td>
<td>Attenuators</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td>Delineators</td>
<td>2 months</td>
</tr>
<tr>
<td>Roadside</td>
<td>Litter</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td>Sweeping</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td>Trees and Brush</td>
<td>3 months</td>
</tr>
<tr>
<td></td>
<td>Drainage</td>
<td>6 months</td>
</tr>
<tr>
<td></td>
<td>Encroachments</td>
<td>2 months</td>
</tr>
<tr>
<td></td>
<td>Guard Rails</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td>Mail Boxes</td>
<td>1 month</td>
</tr>
<tr>
<td></td>
<td>General Public Rating</td>
<td>3 months</td>
</tr>
</tbody>
</table>

The Contractor can request an evaluation when desired, however a minimum of 1 month’s reduced compensation will be imposed. The evaluation will be performed on random sections as stated above within 2 weeks of a written request.
Listed below is the Modified TxMAP inspection form, an example of the scoring sheet and the scoring criteria for each of the elements.

<table>
<thead>
<tr>
<th>Component</th>
<th>Element</th>
<th>Performance Standard (Average)</th>
<th>Rating</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pavement</td>
<td>Main Lane - Rutting</td>
<td>Do not count failures. Do not rate concrete.</td>
<td>Not Rated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Main Lane – Cracking</td>
<td>Do not rate failures.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Main Lane – Failures</td>
<td>No failures, Patches &lt;1/4&quot; high or low.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Main Lane – Ride</td>
<td>Ride smooth with no settlement.</td>
<td>Not Rated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Edges</td>
<td>1 ft. On and 1 ft. Off Pavement.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shoulders</td>
<td>Concrete, two feet or over.</td>
<td>Not Rated</td>
<td></td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>Raised Pavement Markers</td>
<td>Always rate.</td>
<td>Not Rated</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signs – Large</td>
<td>Installed on I or H beams or sign Bridge.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Signs – Small</td>
<td>Chevrons are small signs.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Striping, Pavement Graphics</td>
<td>Required Graphics are present. Score 1 if not striped.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Attenuators</td>
<td>Rate if present.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Delineators</td>
<td>Include OM3's.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadside</td>
<td>Chemical Treatment of Vegetation</td>
<td>Do not rate C/G Section. Do not count off if grass has been herbicided.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Litter</td>
<td>Do not rate in C/G Section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Sweeping</td>
<td>Rated as Needed. Turn Lanes, Bridges, along curbs and barriers.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Trees and Brush</td>
<td>Not rated in C/G Section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Drainage</td>
<td>Not rated in C/G Section. Includes high edges.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encroachments</td>
<td>Not rated in C/G Section.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guard Rails</td>
<td>Stand Up Ends. No approach Rail at Bridges.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Guardrail End Treatments (GETS)</td>
<td>End treatments other than turndowns.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mail Boxes</td>
<td>Rated as Needed. Includes Paper Boxes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Component</td>
<td>Element</td>
<td>Priority Multiplier</td>
<td>Inspection Score</td>
<td>Element Score</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------</td>
<td>--------------------</td>
<td>------------------</td>
<td>---------------</td>
</tr>
<tr>
<td>Pavement Rutting</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Pavement Cracking</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Pavement Failures</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Pavement Ride</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
<td>60%</td>
</tr>
<tr>
<td>Pavement Edges</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
<td>80%</td>
</tr>
<tr>
<td>Pavement Shoulders</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
<td>80%</td>
</tr>
<tr>
<td>Pavement Component Score</td>
<td>37.5 *</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic Operations Raised Reflective Markers</td>
<td>0</td>
<td>Not Rated</td>
<td>6.5</td>
<td>3</td>
</tr>
<tr>
<td>Traffic Operations Large Signs</td>
<td>3</td>
<td>0</td>
<td>60%</td>
<td>3.9</td>
</tr>
<tr>
<td>Traffic Operations Small Signs</td>
<td>3</td>
<td>4</td>
<td>80%</td>
<td>2.4</td>
</tr>
<tr>
<td>Traffic Operations Striping</td>
<td>4</td>
<td>3</td>
<td>60%</td>
<td>2.4</td>
</tr>
<tr>
<td>Traffic Operations Attenuators</td>
<td>4</td>
<td>0</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>Traffic Operations Delineators</td>
<td>3</td>
<td>3</td>
<td>60%</td>
<td>1.8</td>
</tr>
<tr>
<td>Traffic Operations Component Score</td>
<td>10*</td>
<td>10</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>Traffic Operations Component Score</td>
<td>10*</td>
<td>10</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>Roadside Chemical Vegetation Management</td>
<td>5.5</td>
<td>5</td>
<td>100%</td>
<td>5.5</td>
</tr>
<tr>
<td>Roadside Litter</td>
<td>2.5</td>
<td>5</td>
<td>100%</td>
<td>2.5</td>
</tr>
<tr>
<td>Roadside Sweeping</td>
<td>4.5</td>
<td>0</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>Roadside Trees and Brush</td>
<td>3.5</td>
<td>5</td>
<td>100%</td>
<td>3.5</td>
</tr>
<tr>
<td>Roadside Drainage</td>
<td>5</td>
<td>3</td>
<td>60%</td>
<td>3.0</td>
</tr>
<tr>
<td>Roadside Encroachments</td>
<td>3.5</td>
<td>5</td>
<td>100%</td>
<td>3.5</td>
</tr>
<tr>
<td>Roadside Guard Rails</td>
<td>5</td>
<td>0</td>
<td>0%</td>
<td>0.0</td>
</tr>
<tr>
<td>Roadside Mail Boxes</td>
<td>3</td>
<td>3</td>
<td>60%</td>
<td>1.8</td>
</tr>
<tr>
<td>Roadside General Public Rating</td>
<td>10</td>
<td>5</td>
<td>100%</td>
<td>10.0</td>
</tr>
<tr>
<td>Roadside Component Score</td>
<td>33 *</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Ratings are based upon the following: Excellent - New or like new, Good - No work needed, Average - Minimal acceptable condition as shown in the performance measures, Poor - Needs work, Fail - In failed condition, needs rehabilitation or reconstruction.
Modified TxMAPScoring System

Ratings are based upon the following conditions:

<table>
<thead>
<tr>
<th>Component</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Pavement</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rutting (Do not rate FAILURES)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavement - like new, no rutting.</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Very minor rutting &lt; 1/4&quot; Flushing, rock wearing</td>
<td>Minor rutting &lt; 1/4&quot; &lt; 1/2&quot; May be able to feel with vehicle</td>
<td>Moderate Rutting &gt; 1/2&quot;, &lt; 1&quot; May include major rutting at intersections only</td>
<td>Major Rutting &gt; 1”</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cracking</td>
<td>No Cracking</td>
<td>Very minor cracking or with few sealed cracks</td>
<td>Minor cracking or minor cracks sealed with some unsealed or moderate cracks all sealed</td>
<td>Moderate quantity of unsealed cracks or major cracks all sealed or some small spots of block or alligator cracking. May have some very minor spot pumping</td>
<td>Major cracking or block or alligator cracking or any cracking that has substantial pumping</td>
</tr>
<tr>
<td>Failures Do not rate</td>
<td>No Failures</td>
<td>One or two patched failures or &lt; three very minor failures</td>
<td>Several patched failures or &gt; three minor failures</td>
<td>Any moderate failures or a few unpatched potholes. Moderate failures will have tight cracking.</td>
<td>Many unpatched potholes, major failures or any failures that are pumping. Major failures will have loose materials.</td>
</tr>
<tr>
<td>Ride Do not rate</td>
<td>Ride very smooth with no humps or depressions</td>
<td>Ride smooth with few minor humps or depressions or all patches are smooth</td>
<td>Ride adequate with several minor humps or depressions or unlevel patches</td>
<td>Ride rough with many humps, depressions, patches, minor or moderate failures, etc. Unacceptable drop-offs &gt; 50 feet in length and 2” to &lt; 4”</td>
<td>Ride totally unacceptable, causing a reduction in speed below speed limit to control vehicle</td>
</tr>
<tr>
<td>Edges (One foot on and off )</td>
<td>None</td>
<td>Very minor, short lengths &lt; 2”</td>
<td>Minor with a few drop-offs &lt; 50 feet long, &lt; 2” or minor edge raveling</td>
<td>Unacceptable drop-offs &gt; 4” or major edge raveling</td>
<td></td>
</tr>
<tr>
<td>Shoulders Do not rate</td>
<td>Pavement like new with no cracking or failures</td>
<td>Pavement in good shape with very minor or with few sealed cracks or few</td>
<td>Minor cracking or cracks sealed with some unsealed, may have</td>
<td>Moderate amount of unsealed cracks. Few unpatched failures and/or</td>
<td>Shoulder totally failed, severe cracking or base failures or have many unfilled</td>
</tr>
</tbody>
</table>

* Multiplier for elements that are not present in the section of highway rated are not included in the sum.
### Concrete Pavement

#### Rutting

- **Concrete Pavement will not be rated**
- **Do not rate.**

#### Cracking

<table>
<thead>
<tr>
<th>JCP</th>
<th>CRCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>JCP - Very minor cracking; CRCP - Typical transverse cracking on 3-6’ spacing.</td>
<td>JCP - Minor cracking; CRCP - Typical transverse cracking on 3-6’ spacing with some minor shallow pop outs. May have some minor longitudinal tight cracks.</td>
</tr>
<tr>
<td>JCP - Both transverse and longitudinal cracking causing some spalling and very small punch outs; CRCP - both longitudinal and transverse cracking causing spalling and very small punch outs.</td>
<td></td>
</tr>
</tbody>
</table>

#### Failures

<table>
<thead>
<tr>
<th>JCP</th>
<th>CRCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>No Failures</td>
<td>One or two patched failures No asphalt patches</td>
</tr>
<tr>
<td>Several patched failures or a few unpatched shallow spalls or patched shallow spalls</td>
<td>May have some minor longitudinal tight cracks.</td>
</tr>
<tr>
<td>Many unpatched shallow spalls or few small punch outs or failures</td>
<td></td>
</tr>
</tbody>
</table>

#### Ride

<table>
<thead>
<tr>
<th>JCP</th>
<th>CRCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>Ride very smooth with no humps or depressions</td>
<td>Ride smooth with minor humps or depressions</td>
</tr>
<tr>
<td>Ride adequate with several humps, depressions or rough patches</td>
<td>Ride rough with many humps, depressions, patches, failures, etc.</td>
</tr>
<tr>
<td>Ride totally unacceptable, causing a reduction in speed below speed limit to control vehicle</td>
<td></td>
</tr>
</tbody>
</table>

#### Edge

<table>
<thead>
<tr>
<th>JCP</th>
<th>CRCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>None</td>
<td>Very minor, short lengths &lt; 2”</td>
</tr>
<tr>
<td>Minor with a few drop-offs &gt; 50 feet long, &lt; 2”</td>
<td></td>
</tr>
<tr>
<td>Unacceptable drop-offs &gt; 4”</td>
<td></td>
</tr>
</tbody>
</table>

#### Shoulders

<table>
<thead>
<tr>
<th>JCP</th>
<th>CRCP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>5</strong></td>
<td><strong>4</strong></td>
</tr>
<tr>
<td>Pavement like new with only typical cracking</td>
<td>Pavement in very good shape with typical cracking with some minor spalling or with few sealed cracks or few patched failures</td>
</tr>
<tr>
<td>Minor cracking, may have some longitudinal cracking sealed or minor unsealed, may have some patched failures</td>
<td>Major unsealed cracks, some minor unpatched failures. May have grass growing in cracks</td>
</tr>
<tr>
<td>Shoulder totally failed with severe cracking, potholes, base failures.</td>
<td></td>
</tr>
</tbody>
</table>

---

Failures Do not rate

- No Failures
- One or two patched failures No asphalt patches
- Several patched failures or a few unpatched shallow spalls or patched shallow spalls
- Many unpatched shallow spalls or few small punch outs or failures

Ride Do not rate

- Ride very smooth with no humps or depressions
- Ride smooth with minor humps or depressions
- Ride adequate with several humps, depressions or rough patches
- Ride rough with many humps, depressions, patches, failures, etc.
- Ride totally unacceptable, causing a reduction in speed below speed limit to control vehicle

Edge

- None
- Very minor, short lengths < 2”
- Minor with a few drop-offs > 50 feet long, < 2”
- Unacceptable drop-offs > 4”

Shoulders

- Pavement like new with only typical cracking
- Pavement in very good shape with typical cracking with some minor spalling or with few sealed cracks or few patched failures
- Minor cracking, may have some longitudinal cracking sealed or minor unsealed, may have some patched failures
- Major unsealed cracks, some minor unpatched failures. May have grass growing in cracks
- Shoulder totally failed with severe cracking, potholes, base failures.
<table>
<thead>
<tr>
<th>Traffic Operations</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raised Pavement Markers</td>
<td>Markers like new with none missing. Placed on standard placement.</td>
<td>Most in place, may have a few missing or obviously non-reflective, cracked or pressed into adhesive.</td>
<td>Most in place, maximum of 10% missing or obviously non-reflective, cracked or pressed into adhesive or adhesive over reflective face.</td>
<td>Many missing, maximum of &lt;25% missing or obviously non-reflective, cracked or pressed into adhesive or adhesive over reflective face.</td>
<td>Most &gt;25% missing or non-reflective or no markers installed</td>
</tr>
<tr>
<td>Large Signs (Installed on I or H beams or sign bridge)</td>
<td>Signs like new, with all background, lettering, borders and shields clean and reflective. No damage.</td>
<td>Signs generally good; background, lettering, borders and shields may be slightly faded. May have very minor damage.</td>
<td>Signs borderline acceptable; background, lettering, borders and shields may be slightly faded or mildewed. May have some damage.</td>
<td>Signs unacceptable with dirt or mildew. May be faded or have substantial damage. May have one or two high or low bases.</td>
<td>Signs totally unacceptable with severe dirt, mildew or fading. May be damaged or totally knocked down. Several bases are high or low.</td>
</tr>
<tr>
<td>Small Signs (Chevron are signs)</td>
<td>Signs like new, on standard posts, no repairs needed. All straight</td>
<td>All on standard supports. Very minor repairs needed. All required signs are in place. No high or low bases. Most are straight</td>
<td>All on standard supports, &lt;50% leaning or with dirty, damaged or bad sign faces. No high or low bases.</td>
<td>All on standard supports, most leaning or dirty, damaged or bad sign faces. One non-regulatory maybe missing. Some may have high or low bases.</td>
<td>Signs not on standard supports or any regulatory sign missing or more than one other sign missing. MOST ALL are leaning and bad or damaged sign faces. Stripes totally unacceptable with severe cracking, fading or severely worn. Major loss of reflectivity. ANY road without a stripe.</td>
</tr>
<tr>
<td>Striping Graphics</td>
<td>New or like new. All required graphics are in place and like new</td>
<td>Stripes in very good shape with no obvious loss of reflectivity. All required graphics are in good condition</td>
<td>Stripes in acceptable shape with some cracking or minor loss of reflectivity. May have crack seal slightly obscuring some stripe. Required graphics are present.</td>
<td>Stripes unacceptable with cracking, fading, or severely worn. May be substantially covered with crack seal material. Needs to be replaced. Graphics are missing.</td>
<td>Stripes totally unacceptable with severe cracking, fading or severely worn. Major loss of reflectivity. ANY road without a stripe.</td>
</tr>
<tr>
<td>Attenuator</td>
<td>New or like new to current standards with no damage.</td>
<td>Attenuator not damaged; may not be latest standard.</td>
<td>Attenuator functional but with very minor damage. May need painting.</td>
<td>Attenuator with moderate damage but will still function as designed.</td>
<td>Attenuator that will not function as designed</td>
</tr>
<tr>
<td>Delineators (OM3 or delineators)</td>
<td>Delineators, new or like new, straight, installed in accordance with standards. No repairs needed.</td>
<td>Delineators posts &lt;50% slightly leaning or with some damaged and non reflective delineators</td>
<td>Delineators &lt;50% slightly leaning and &lt;50% delineators damaged or non reflective, or most post slightly leaning, or most delineators non reflective.</td>
<td>Most post slightly leaning and delineators non reflective or one or two post bent, broken, down or missing.</td>
<td>Several bent, broken damaged or missing. Not installed in accordance with standards</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
</tbody>
</table>

**Roadside**

<table>
<thead>
<tr>
<th>Chemical Vegetation Management</th>
<th>5</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>No noxious weeds. No grass in pavement.</td>
<td>Very little noxious weeds, May have obvious signs of herbicide application.</td>
<td>May have some small stands of Johnson grass or other noxious weeds or have short areas of grass in pavement. ROW acceptable with one or two objectionable spots of litter or debris. Several single pieces of litter, or debris.</td>
<td>Large stands of Johnson grass or other noxious weeds or have grass along edge of pavement or in some cracks. ROW unacceptable, with much litter or debris.</td>
<td>Large stands of Johnson grass or other noxious weeds. May have severe sight distance problems. Grass is over one foot into edge of pavement</td>
<td></td>
</tr>
</tbody>
</table>

| Litter (Do not rate in C/G section) | ROW clean with no or very minor litter. Litter not visible at posted speed limit. No debris present. | ROW generally clean with only a few pieces of litter or debris visible at posted speeds. | ROW acceptable with one or two objectionable spots of litter or debris. Several single pieces of litter, or debris. | Substantial quantities of dirt, debris and/or ice rock built up along barriers, turn lanes, curbs or bridges. May cause minor drainage problem. | Debris built up along curbs, turn lanes, or bridges that would cause a hazard or drainage problem. |

<p>| Sweeping (Rate as needed) | Clean, no dirt debris or ice rock along curbs, bridges, turn lanes, or barriers. | Very minor dirt, ice rock, or debris along curbs, turn lanes, bridges, or barriers. | Some debris, dirt or minor ice rock on bridges, along curbs, turn lanes or barriers. | Debris built up along curbs, turn lanes, or bridges that would cause a hazard or drainage problem. | Debris built up along curbs, turn lanes, or bridges that would cause a hazard or drainage problem. |</p>
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trees and Brush</td>
<td>Trees trimmed to allow mowing beneath. No sight restrictions or sign obstructions. ROW neat. No trees in clear zone. No dead trees or limbs standing or laying in ROW.</td>
</tr>
<tr>
<td>Trees generally trimmed</td>
<td>No sight restrictions or sign obstructions. May have some minor brush or trees in need of cutting. Few dead trees or limbs standing or laying in ROW.</td>
</tr>
<tr>
<td>Trees and brush unkept</td>
<td>Trees and brush may have substantial growth. No sight restrictions or sign obstructions. May have a few trees within clear zone. Few dead trees or limbs present.</td>
</tr>
<tr>
<td>Trees and brush unkept</td>
<td>Trees and brush unkept. Tree limbs encroaching onto pavement or large trees &gt; 5” within clear zone. Has sight restrictions and/or sign obstructions. Dead trees and limbs present.</td>
</tr>
<tr>
<td>Drainage</td>
<td>Ditches and channels like originally constructed, clear of silt or erosion. Vegetation as appropriate in ditches. No high shoulders</td>
</tr>
<tr>
<td>Ditches and channels</td>
<td>Ditches and channels like originally constructed may have minor silt or erosion. Vegetation as appropriate in ditches. Minor spots of high shoulders</td>
</tr>
<tr>
<td>Ditches and channels</td>
<td>Substantial erosion or siltation in ditches or channels. Does not function as designed. Potential exists for additional erosion. High shoulders may trap water on pavement. Washouts around culverts, bridges and etc.</td>
</tr>
<tr>
<td>Drainage</td>
<td>Extreme erosion or siltation in ditches or channels. Does not function as designed. Potential exists for additional erosion. Erosion has created a safety hazard. High shoulders may trap water in travel lanes.</td>
</tr>
<tr>
<td>Encroachments</td>
<td>No illegal signs, buildings, vehicles, etc. encroaching on highway ROW. No apparent or frequent access control violations.</td>
</tr>
<tr>
<td>Access Control</td>
<td>May have a few illegal signs, buildings, or vehicles slightly encroaching onto ROW. Does not cause a safety problem. May have very minor or infrequent access control violations.</td>
</tr>
<tr>
<td>Has illegal signs</td>
<td>Has illegal signs, buildings or vehicles encroaching onto ROW. They are causing a safety problem and should be removed. Has more than one obvious access control violation.</td>
</tr>
</tbody>
</table>

**Notes:**
- Trees and Brush (Do not rate in C/G section)
- Drainage (Do not rate in C/G section)
- Encroachments Access Control (Do not rate in C/G section)
<table>
<thead>
<tr>
<th>Guardrail (Rate as needed)</th>
<th>Guardrail like new, appropriately placed, installed to the latest standards.</th>
<th>Guardrail all functional. May have one minor dent or may not be the latest standard.</th>
<th>Guardrail all functional with several minor dents or out of alignment.</th>
<th>Guardrail has been hit and is not functional. Guardrail has standup ends instead of turn down or turn down instead of GET. Guardrail is low.</th>
<th>Guardrail has major damage and should be repaired as soon as possible. Guardrail is required and not installed at bridge ends</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mailboxes</td>
<td>Mailboxes straight, all on standard supports and hardware, with standard delineation.</td>
<td>Mailboxes all on standard supports and hardware, with standard delineation. Some leaning</td>
<td>Mailboxes all on standard supports and hardware. Many leaning, some may not have standard delineation.</td>
<td>Several mailboxes on non-standard supports, some are safety problems, most other not to standard</td>
<td></td>
</tr>
<tr>
<td>Public Rating</td>
<td>Ride smooth, quiet, with no crack sealing or patches, all required signs straight and clean, good striping and RPM’s, no litter, vegetation of uniform height,</td>
<td>Ride generally smooth with little road noise, crack sealing, or patches, few signs may be leaning slightly, good striping and RPM’s, minor litter, vegetation of uniform height</td>
<td>Ride may be slightly rough, crack sealing and/or patched, signs leaning, Non required signs missing, minor litter, striping and RPM’S borderline vegetation borderline with small amount of noxious weeds.</td>
<td>Pavement condition may cause damage to vehicles, severe rutting holding water, signing faded and leaning, or missing regulatory signs, unacceptable amount of litter on shoulders and roadside, vegetation totally unacceptable, striping and RPM’S very bad or missing</td>
<td></td>
</tr>
</tbody>
</table>

7. **Measurement.** This Item will be measured by the highway freeway mainlane centerline mile and each frontage road centerline mile being maintained each month as required by the state.

Highway freeway mainlanes with frontage roads includes the travel lanes and area within the mainlane drainage ditches or 30 feet outside the mainlane travel lanes in areas with no ditches.

Highway freeway mainlanes without frontage roads includes the maintenance of all of the right of way on the sides of the main lanes without frontage roads.

Frontage road centerline mile includes the frontage road travel lanes and area from the mainlane ditches or 30 feet outside the travel lanes to the right of way line.

29-30  7569  07-10  319
8. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Total Maintenance and Operation of Highways Freeway Mainlanes," and “Total Maintenance and Operation of Highways Frontage Road”. This price shall be full compensation for this work and for furnishing all labor, equipment, materials, fuel, tools and incidentals necessary to complete the work. Maintenance of ramps and direct connectors are subsidiary to the maintenance of the highway freeway mainlanes. Maintenance of cross roads with locations shown on the plans are subsidiary to the maintenance of frontage roads.

Should construction or reconstruction project(s), which add mainlane capacity or totally reconstruct the pavement, occur or are ongoing, involving portions of highways covered by this contract, the Contractor shall be relieved of duties along those portions of highways for the duration of the construction project.

9. **Contract Extension.** If agreed upon in writing by both parties to the contract, the contract may be extended an additional 36 months
Exhibit C.3

**TxDOT: Rest Area Total Maintenance, Operation and Repair (Contract)**

This information was located at the main TxDOT website. This Rest Area contract specification is a currently used contract in Texas. Texas Rest Area contracts include incentives which are a unique feature to promote performance. This information was collected via email after a phone interview with Mr. Andy Keith, Rest Area program supervisor.

Reference:

Keith, Andy. Personal interview. 10 June 2011.

Used with permission by Andy Keith.
SPECIAL SPECIFICATION

7284

Rest Area Total Maintenance, Operation and Repair

1. **Description.** Perform complete maintenance and operation of rest areas shown on the plans, including all the existing features and any items installed by the Department or Contractor. Unless otherwise noted, the limits of work include all areas currently being maintained which generally begin at the beginning of the ramp entering the rest area and end at the end of the ramp leaving the rest area. It will also include any utility line or appurtenances serving the rest area outside these limits that belong to the Department. Accept the rest areas in an “as is” condition at the beginning of the work.

2. **General.** Perform janitorial services, maintenance of buildings, grounds, utilities and all necessary repairs to ensure the proper operation of rest areas. Operate, maintain and repair items such as, but not limited to, the following: electrical and plumbing systems, utilities, wind turbines, video surveillance systems, water and waste-water treatment systems, buildings (including vending building) and their structural elements, pavements, pavement markings, drainage facilities, landscaping, lavatory fixtures, toilets, signs, luminaires, flags, flag poles, irrigation system and playground equipment.

The intent of this specification is to relieve the Department of all duties traditionally performed in maintaining and operating rest areas. Be completely aware of the traditional functions of the Department concerning the maintenance and operation of rest areas.

This contract shall commence upon the issuance of a work order and continue for a period of 24 months. The contract may be extended in 24-month increments for a maximum of 3 extensions. Extensions will include maintenance, operation and repair. Provide appropriate information concerning subcontractors and receive approval prior to use.

3. **Materials.** Furnish previously approved replacement hardware, materials and supplies. Furnish replacement hardware of the same type as original unless otherwise approved. All water, electrical, gas and sewer service accounts will continue to be the responsibility of the Department. Pay for utility costs due to wasteful use or un-repaired leaks as determined by the Engineer, and based upon a historical comparison. Approval of materials and supplies by the Engineer does not relieve the Contractor of insuring their proper performance.
Provide fire extinguishers and first aid kits for rest area storage rooms. Provide a current Material Safety Data Sheets (MSDS) notebook and inventory list of every material used in the rest area. Keep the notebook in the storage area and make available at all times.

4. **Equipment.** Furnish all tools, equipment and uniforms. Supply a telephone for emergency use during all hours of operations. Provide a pressure washer of sufficient pressure to remove dirt, mildew, gum, etc., but not damaging to concrete finish.

5. **Personnel.** Rest area attendants have direct contact with the traveling public and project an image of the contractor and the Department. Provide courteous rest area attendants meeting high standards of personal hygiene and behavior. Prior to use, provide a list of all employees and as a minimum, a criminal background check. Any employee deemed objectionable by the engineer shall immediately be replaced.

Provide appropriately licensed personnel for specialized work including, but not limited to, electricians, plumbers, treatment plant operators, pesticide applicators, etc.

6. **Work Methods.** The number and location of rest areas, the attendant duty hours and other scheduled items of work are shown on the plans. Provide a minimum of 1 attendant at each rest area during the required duty hours. Perform work 7 days a week, including holidays. Install, to the design and at locations approved, signs with the Contractor’s name, address and toll free phone number at each rest area. Provide a contact person(s) available 24 hours a day to respond to emergencies. Do not allow employees to live at rest areas.

A. **General.**

1. Maintain a daily diary at each rest area detailing, the information shown below. Furnish the original diary to the Department annually. Make the diary available upon request. Include as a minimum the following:

   a. Date
   b. Employee entering information
   c. Maintenance procedures performed
   d. Problems encountered and resolution
   e. Equipment malfunctions, time of malfunction and time of repair.
   f. Incident occurrences of any nature
   g. Public complaints
   h. Lost and found items
   i. Employees, equipment used and hours worked
   j. Weather
k. Visiotrs on official business (TxDOT, TCEQ, Law Enforcement, contractor, etc.)

2. Submit a monthly summary report, on an approved format, by the 10th of each month indicating the following: the rest area, any facility malfunction, required repairs, repairs made, vandalism, complaints, incident and other items considered significant. Include at a minimum the following:

a. Description.

b. Date, time and location.

c. Action and time frame taken to rectify problem.

d. Subcontractors used.

3. Perform all work near roadways or highways utilizing a traffic control plan conforming to the Texas Manual on Uniform Traffic Control Devices (TMUTCD).

4. Close a rest area for major repairs, if approved. Notify the Engineer immediately of any rest areas closed because of malfunctions. Install approved signs on the advance notification signing that the rest area or rest rooms are closed and install barricades across the rest area entrance ramp if closing the entire rest area, as approved.

Provide temporary toilet facilities meeting the requirements of the Americans with Disabilities Act for any rest area closed more than 12 hours. Clean, sanitize and empty temporary facilities as needed or approved.

Reopen closed rest areas as soon as possible.

5. Take precautions during all operations to protect the rest area visitors, including but is not limited to mowing, edging, trimming, painting, pesticide application, etc.

6. Although lead based paint or other occupational hazards are not anticipated, take precautions as necessary to ensure the safety of employees and the traveling public.

7. Keep storage areas closed and locked when not occupied and in a clean and orderly condition at all times. Be responsible for equipment and supplies kept in the storage areas. Ensure cleaning chemicals are labeled.

8. For enclosed facilities with air conditioning or heaters, maintain temperature at 78°F in the Summer and 68°F in the Winter; plus or minus 3°F. For facilities with heating, ventilation, and air conditioning systems, change filters as required.
9. Report daily “lost and found” items discovered. Secure items found, until collected by the Department.

10. Treat all rest area visitors in a proper manner and use the utmost courtesy at all times.

11. Do not accept tips or other gratuities from the traveling public.

12. Ensure radios or similar devices are not audible by visitors.

13. Ensure no visitors of contract personnel, including relatives of the Contractor’s employees remain in the rest areas during working hours, unless they are bona fide employees of the Contractor.

14. Provide at least one English-speaking employee per rest area.

15. Relocate abandoned vehicles to an approved location, or coordinate the removal by law enforcement.

16. Ensure undesirable activities such as camping, vending or soliciting do not occur. Request law enforcement assistance as needed.

17. Provide approved professional tan uniforms with readily visible identification for all rest area personnel working at the rest areas unless otherwise approved. Provide identification consisting of the name of the person, and the name of the Contractor followed by the term “Contract Attendant”. Ensure attendants wear caps or hard hats emblazoned with an approved identification at all times. Provide additional protective clothing and headgear as needed bearing appropriate insignia previously described.

18. Comply with the provisions of Title 8, Chapter 122 of the Texas Human Resources Code, which outlines the requirement for the use of Community Rehabilitation Programs (CRPs).

State Use Contracts presently exist for rest areas shown on the plans. Renegotiate these contracts with TIBH Industries, Inc. Contact Ron Bartles with TIBH at (512)930-4232. Make payments to the Central Non-Profit Agency (CNA).

Renegotiate State Use contracts before their expiration in accordance of Chapter 122 with the Human Resource Code.

The Department reserves the right to arbitrate disputes involving subcontracts or potential subcontracts with CRPs and the CNA. Provide copies of the executed contracts to the Engineer within two weeks of execution.

19. Do not distribute, advertise or sell products or services of any kind in the rest area, unless approved.

Be aware of the provisions of Title 5, Chapter 94 of the Texas Human Resources Code, which outlines vending requirements by the Texas
Commission for the Blind. Maintain the vending building and its appurtenances.

20. Requests to establish holiday coffee rest stops at a rest area will be processed by the appropriate Department district. Copies of all approved requests will be forwarded to the Contractor. Cooperate with all approved entities and assist in any resulting cleanup necessary.

Prohibit any unapproved entities from establishing a holiday coffee rest stop.

21. Report spilled hazardous materials to the Texas Commission for Environmental Quality (TCEQ) and remEDIATE according to TCEQ requirements. Take responsibility for the cleanup and the cost if the responsible party cannot be identified. Clean up hazardous material as soon as possible.

B. **Janitorial Services.** Keep the rest area clean, pleasant smelling and free of all dirt, trash or insects at all times. Schedule restroom closures for janitorial work during off peak times. For rest areas with dual men’s and women’s facilities, ensure 1 men’s and 1 women’s restroom remains open at all times. Ensure all rest room facilities are open when no janitorial or repair work is being performed. Display ‘Caution Wet Floor’ signs when the floor is wet. Disinfect entire restroom after cleaning. Utilize the following check list to ensure rest areas are kept clean and presentable:

Perform the following services on a maximum of 8-hour intervals. Inspect each restroom a minimum of 1 time each hour during scheduled duty hours. Immediately address items requiring attention.

1. Mop floors with an appropriate cleaning solution. Thoroughly remove cleaning solution. Immediately clean floors if they become soiled prior to scheduled cleaning.

2. Clean restroom walls, partitions, fixtures, doors, woodwork and handrails. Thoroughly remove cleaning solution. Do not use abrasive cleaning powders to clean the walls and ceilings. Immediately clean listed items if they become soiled prior to scheduled cleaning.

3. Clean surfaces of the sinks and counter tops including levers, spouts and drains. Thoroughly remove cleaning solutions and wipe areas dry.

4. Scrub the inner surfaces of the urinals and toilets. Clean the seat, rim and other surfaces of the fixtures. Wipe the exterior surfaces and rims dry.

5. Clean glass mirrors with a streak free glass cleaner and wipe dry. Clean stainless steel mirrors with a mild liquid soap and wipe dry with a soft cloth.

6. Empty trash receptacles.
7. Ensure cleaning utensils (brushes, rags, etc.) used to clean toilets and urinals are not used to clean other fixtures or items. During cleaning, ensure that water from toilets and urinals does not splash or drip on to the floor.

8. Ensure the restrooms are sufficiently stocked with toilet tissue, air freshener and hand-soap at all times.

9. Keep all materials and tools in the storage area when not in use.

10. Minimize closing of restrooms for janitorial work. Schedule janitorial operations such as pressure washing of floors, ceilings, walls, or similar activities that would inconvenience the traveling public to off peak times. Ensure restrooms are closed for no more than 30 minutes during a cleaning operation.

11. Remove graffiti or other markings immediately. Paint over when necessary. Repair surface prior to applying paint, where graffiti is scratched into a surface. Display “Caution Wet Paint” signs. Paint entire surface if painting of graffiti results in mismatched colors.

12. Replace all cracked, broken, non-functioning items such as rusted lights, liquid soap dispensers, trash receptacles, hand dryers, sinks, mirrors, stall doors, partitions, urinals and commodes as soon as possible throughout the life of the contract.

13. Touch up paint as necessary to ensure rest area does not show any graffiti, rust stains or peeling paint.

14. Clean lobby or entry area as needed.

15. Clean inside and outside of display cases and windows daily. Use cleaner that does not damage acrylic material.

C. Rest Area Grounds. Perform the following services as often as needed. Perform inspections of each item hourly. If service is needed, address immediately.

1. Keep drinking fountains operational, clean and sanitary. Turn off and drain water from drinking fountains when freezing temperatures are forecast.

2. Clean and repair as needed; tables, benches, arbors, trash receptacles, barbecue pits, fireboxes and other outdoor appurtenances. Clean and disinfect soiled and stained items. Rinse thoroughly with clean water. Do not apply a disinfectant to table or bench tops unless the surfaces can be rinsed off immediately with clean water.

3. Keep slabs, walks and driveways free of chewing gum, sand, gravel, grease, leaves, spills and all other types of debris. Pressure wash slabs and walks at the beginning of the contract to remove existing gum and other
4. Remove animal droppings daily or more often if necessary. Utilize non-lethal methods to discourage bats, birds or other animals in cases of severe infestation.

5. Keep grounds free of litter. Pay particular attention around the rest area buildings, arbor units and trash receptacles. This includes, but is not limited to trash, wastepaper, garbage, scrap metals, paper, wood, plastic, glass products, bottle caps, ring-pull tabs, cigarette butts, gum wrappers, feces, animal remains and other items discarded.

6. Empty trash receptacles and replace liners. Clean trash receptacles periodically as needed. Temporarily store litter at an approved screened site located at the rest area. Empty dumpsters a minimum of twice a week. Clean or replace dumpsters retaining offensive odors, as necessary. Dispose of litter off the right-of-way in accordance with federal, state, and local regulations.

7. Clear ice and snow from roadways, parking lots and sidewalks as soon as practical. Utilize approved sand and anti or de-icing chemicals to facilitate utilization of the paved areas and sidewalks.

D. Landscape Maintenance. Keep landscape areas neat, mulched, with healthy plants and no weeds at all times.

1. Replace landscaping plants that are damaged or dying with like items. This includes, but is not limited to plants, shrubs and trees.

2. Treat all landscaping as necessary for insect infestations, damaging fungi, and damaging parasites. Use approved treatment methods and chemicals.

3. Replenish mulch as necessary to maintain a 3-in. depth. Do not allow bare spots or exposed irrigation pipes.

4. Plant and maintain ornamental bedding areas with blooming flowers or perennials as approved from March through November, annually. Replace flowers as necessary to compensate for varying growing and blooming seasons of the area or as approved. Utilize flowers that have proven to be successful within the area and during the respective season. Water ornamental bedding areas sufficiently to keep all plantings lush without distress. Remove ornamental bedding plants that appear to be distressed or beyond their useful life and replace regardless of the timing.

5. It is the intent of this specification to provide dense, lush, colorful and attractive ornamental bedding areas from March 1 through November 30 annually.

E. Vegetation Maintenance.
1. Water grass, trees and shrubs during the early morning hours. Follow all local limitations concerning drought or water restrictions. Utilizing approved fertilizer and rates, fertilize twice a year (early spring and mid fall) in accordance with manufacturer’s recommendations.

2. Treat all vegetation as necessary for insect infestations, damaging fungi, and damaging parasites.

3. Revegetate bare ground as needed or directed.

4. Mow areas shown on the plans. Maintain grass height between 2 to 5 in. Maintain remote areas from 4 to 8 in. when approved. Abide by local laws concerning air quality. Use push type lawnmowers or hand held trimmers around trees, arbor units and other appurtenances. Use tractor driven mowers in other areas, if approved. Equip all mowers with non-damaging turf type tires. Avoid mowing wildflowers in remote areas, except as directed or approved.

5. Edging and Trimming. In conjunction with each mowing, edge all sidewalks, concrete pads and curbs with an edger designed to provide a vertical cut. Using a string trimmer, trim around all buildings, trees, shrubs, light poles, guard posts, signs, delineator posts, culvert headwalls and any other appurtenances.

6. Remove noxious weeds and other undesirable growth from lawns, beds of plants and shrubs, as needed. Perform inspections and remove all weeds daily. Trim trees and shrubs as needed. Do not allow trees or shrubs to encroach upon walkways or structures at any time. Trim trees and shrubs in accordance with ANSI 300 standards to maintain uniform and aesthetically pleasing form. Take precautions as necessary to ensure oak wilt or other plant infestations or diseases are not spread. Herbicides that are proven safe for plants, grass and desirable plants may be used to kill weeds, but must be approved before application.

7. Remove all dead or dying trees as approved. Receive approval prior to removing other trees.

8. Remove and dispose of tree clippings, limbs, leaves and pine straw from grounds, buildings and arbors. Dispose of removed vegetation at appropriate offsite locations in accordance with applicable local, state and federal statutes.

F. Appurtenances. Maintain and repair all outdoor appurtenances. This includes but is not limited to tables, signs, benches, arbors, barbecue pits, fireboxes, litter barrels, lights, flags, flagpoles and other outdoor appurtenances. Replace any outdoor appurtenance that cannot be repaired as soon as possible.

G. Drainage. Maintain and repair rest area drainage-ways, including any underground facilities. Remove blockage of drainage facilities as soon as
possible after discovery. Inspect drainage facilities every 6 months to ensure their proper operation. Backfill eroded areas with approved soil and revegetate.

H. **Signing and Lighting.** Maintain, repair or replace all traffic operations appurtenances including, but not limited to, delineators, signs and luminaires in accordance with the TMUTCD and other appropriate departmental guidelines and policies.

I. **Sidewalks, Curbs and Pavements.** Maintain, repair or replace all rest area pavements, ramps, parking lots, sidewalks, curbs and slabs. Perform preventive maintenance such as crack sealing, spot seal coating, etc. at the first sign of deterioration to deter the need for repair. Repair all pavement failures, potholes, cracking, rutting, punch-outs, flushing and joint failures by approved methods as soon as possible or as approved.

J. **Striping and Raised Reflective Pavement Markers.** Maintain and repaint striping and specialty markings to the latest standard as needed. Replace missing or broken raised pavement markers as needed.

K. **Building Maintenance and Repair.** Maintain and repair all buildings and structures within the rest area complex. Maintenance and repair includes, but is not limited to, the following items:

1. Make all structural and architectural repairs of building interiors and exteriors. Ensure the structural integrity of all buildings is maintained at all times. Address necessary repairs affecting structural integrity immediately. Obtain approval of repair methods and schedules.

2. Repair or replace electrical system, plumbing system, utility lines, water and waste water system, hand dryers, light fixtures, lavatory fixtures, toilets, tiles and any other repairs necessary for operation of the rest areas. Perform repair or replacement of these items within 24 hours unless approved.

3. Address paint blistering, paint peeling, mildew, or mold within one week of discovery or as approved. If interior or exterior paint is faded, peeling, shows touchup painting of different shades or otherwise not aesthetically pleasing, perform a complete painting of the total structures and fixtures. Sandblast rusted metal to bare metal and prime with rust inhibiting primer prior to painting with exterior paint.

4. Maintain interactive computer and interpretive exhibits displays. Replace computer hardware for the internet and interactive exhibits on an as needed basis to insure displays are working. Ensure displays are repaired within 48 hours of failure.

L. **Water and Wastewater Facilities.** Some of the piping, lift stations or other water or wastewater facilities may not reside totally on the rest area grounds. The Contractor’s responsibility includes all Department facilities servicing the rest areas regardless of their location.
1. **Water Treatment Plant Operation.** Provide maintenance, testing, repair and operations of water treatment plant facilities servicing rest areas where applicable. Maintain and repair items such as piping, pumps, control systems, electrical systems, motors, chemical treatment systems, and filter media within the system. Test and maintain in accordance with the most current regulations, guidelines and revisions as required by federal, state and local codes or statutes. Provide operator licensing and associated facility licensing, permits and fees, as necessary.

2. **Water Well Operation.** Provide maintenance, testing, repair and operation of water well units serving rest area facilities where applicable. Maintain and repair items such as piping, pumps, chemical treatment systems, control systems, electrical systems, and motors above and below ground within the well unit. Test and maintain in accordance with the most current regulations, guidelines and revisions as required by federal, state and local codes or statutes. Provide policing of water well clearance zones, operator licensing and associated facility licensing, permits and fees.

Replace or re-drill wells if needed to provide adequate water for rest area operations. Acquire all permits as required.

3. **Wastewater Treatment Facility Operation.** Provide maintenance, testing, repair and operations of wastewater treatment facilities servicing rest area facilities where applicable. Wastewater treatment facilities include, but are not limited to, septic tanks, septic tank evaporative fields, evaporation/transpiration systems, gray water sprinkling systems, electrical systems, control systems, chemical treatment systems, and any facility utilized for wastewater treatment at a rest area facility. Test and maintain in accordance with the most current regulations, guidelines and revisions as required by federal, state and local codes or statutes. Provide licensed operators. Renew and pay for facility licensing, permits and fees as necessary.

4. **Wastewater Lift Stations.** Provide maintenance, repair and operations of wastewater lift stations servicing rest area facilities where applicable. Lift station facility includes such items as piping, pumps, control systems, electrical systems, wet wells, dry wells and associated buildings/covers.

5. **Water Reservoir(s) and Booster Pump Station Operation.** Provide maintenance and operations of water reservoirs, booster pump stations, water mains, and associated appurtenances servicing rest area facilities where applicable. Maintain pump stations as designed. Maintain pressures and volumes to facilitate full operation of all applicable rest area appurtenances in accordance with Texas Commission on Environmental Quality (TCEQ) requirements.

6. Coordinate as necessary with the Texas Commission for Environmental Quality. Comply with all TCEQ licensing, facility permit renewal and
M. Emergency Operations. Coordinate closures with the project engineer.


A. Inspection. TxDOT District personnel will inspect the rest areas on a frequent basis. Deficiencies will be noted and provided to the Project Engineer. These informal inspections will not be the basis for assessment of incentives or disincentives. They may be used to document contractors’ performance for the removal of disincentive pay reductions.

B. Incentives and Disincentive Payments. The Department will perform unannounced random evaluations of each rest area facility. The evaluation will be made utilizing an evaluation form as shown in the Appendix. Maintain a minimum overall score of 85% at each rest area facility. The Contractor will be notified of all evaluations below the standard after a review by the Engineer. Evaluation scores of less than 85% or 92% and over will result in incentive or disincentive payments as shown below, by taking the rest area’s monthly bid price, dividing by 30 to get a cost per day. The cost per day will then be multiplied by the Daily Payment Multiplier as shown below to determine the daily incentive/disincentive payment. Disincentive payments shall be charged daily, beginning on the day it is reported to the contractor, until a reevaluation results in the minimum acceptable overall score as shown above. Request a re-inspection for any rest areas receiving scores below 85% when corrections have been made to ensure a minimum 85%. The rest area will be reevaluated a maximum of 7 days after the Contractor’s request. A minimum disincentive payment of 7 days will be charged for scores below 85%. Incentive payments will be paid beginning on the day of a 92% or better inspection, until a future inspection results in scores below 92%. The daily incentive/disincentive payment will be multiplied by the number of days above/below the standard, to determine the total incentive/disincentive for the month.

<table>
<thead>
<tr>
<th>Score</th>
<th>Daily Payment Multiplier</th>
<th>Desirable</th>
<th>Acceptable</th>
<th>Needs Improvement</th>
<th>Poor</th>
<th>Unacceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>92% or Greater</td>
<td>+ 0.15/day</td>
<td>85% - 91.99%</td>
<td>80% - 84.99%</td>
<td>75% - 79.99%</td>
<td>Less than 75%</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>0</td>
<td>- 1.00/day</td>
<td>- 1.5/day</td>
<td>- 2.0/day</td>
<td></td>
</tr>
</tbody>
</table>
If for a specific rest area, an evaluation results in a score of less than 75% or 2 consecutive evaluations are less than 85%, or if a specific rest area element is rated one or less three consecutive evaluations or one or less in three out of four consecutive evaluations, even though the overall score meets the acceptable requirement, the Engineer will issue a notice with a deadline to correct deficiencies. The Contractor will pay an additional $5,000 a day, in addition to the disincentive payments, for every day past the deadline the work remains deficient. In addition, the Engineer may take steps to have the work corrected, including the use of Emergency Contracts. Once the Contractor is notified that the Department is taking corrective action, the Contractor will refrain from taking steps of its own. The costs associated with these measures will be deducted from any monies due the Contractor for work at the specific rest area where the contract deficiency occurred. If a rest area is closed due to a major malfunction, it may only remain closed for a maximum of three days. Unless otherwise approved by the Engineer, additional disincentive reductions of $5,000 a day will be charged for each day the rest area is closed beyond the 3-day limit.

C. **Contract Compliance.**

If the Contractor fails to perform items required by the contract but not covered by the site evaluations, payment will not be made for those items. The Engineer will determine the amount to be deducted.

7. **Accidents/Incidents and Third Party Claims.** Report no later than the 15th of each month, information from the previous month on any accident or incident related to work being performed, including, but not limited to any accident involving the traveling public that causes damage to an appurtenance or fixture within the right of way.

A. Include the following information as a minimum:

1. the date and time of the accident/incident;
2. the location of the problem;
3. the nature of the problem;
   a. digital photographs of traffic control items, accident/incident scene, damaged highway features, etc;
   b. all parties involved in the incident including name, address, telephone number and their involvement (including witnesses);
   c. responsible party and insurance information, description of vehicles involved;
   d. action taken to address the incident;
   e. documentation of traffic control in place at location;
   f. weather and road conditions;
   g. type of hazardous materials, if applicable; and
4. Immediately report to the Department the following:
   a. accidents involving Contractor or subcontractor personnel, equipment, barricades or tools;
   b. traffic accidents within the limits or in the vicinity of any work being performed by the Contractor or its subcontractors;
   c. accidents/incidents causing multiple fatalities, numerous injuries or significant property damage resulting from fire, explosion or the release of hazardous materials that necessitates the evacuation of the immediate area, or the closing of roads, streets, or highways;
   d. highway accidents involving any fatality;
   e. any accident involving a school bus;
   f. any incident that causes a major highway to be closed, except for closures (maintenance, construction, etc.) where the public has been notified in advance via newspaper, radio or television announcements;
   g. any incident than causes major damage to highway facilities;
   h. hazardous material spills; In addition, provide documentation that the city or county environmental office and the Texas Commission on Environmental Quality (TCEQ) have been notified.
   i. all bridge failures or closures;
   j. any chain reaction accident involving more than 10 vehicles, regardless of the number of fatalities, injuries or length of time the highway is closed;
   k. unusually hazardous weather conditions.

For third party claims, submit proposed claim to the Department who will review, revise, and approve the claim as appropriate. Once approved, file the claim in the Department’s name on a form provided by the Department. Any monies collected will be paid to the Department who will pay the Contractor on the next pay request. Damages not reimbursed will be turned over to the Texas Attorney General for determination for further action. Any monies collected as a result of further action will be paid to the Contractor on its next pay request minus the Texas Attorney General’s cost. The Contractor’s liability for non-reimbursed claim(s) will be limited to a maximum of $50,000 per incident.

8. **Capital Repair.** In the unlikely event that major damage caused by catastrophic events should occur, pay the first $50,000 per event per rest area not reimbursed by the FHWA or third parties. The Department will be responsible for any amount over $50,000 which
will be added to the Contractor’s monthly payment after the work is completed. The Department will be responsible for problems due to unknown pre-existing conditions or design defects. Submit a bid for the repair cost and if approved, receive an executed change order prior to commencing work. The Engineer reserves the right to reject the Contractor’s proposal and perform the work by state forces or other contract. In the event the Engineer exercises this option, the Contractor shall be responsible for the first $50,000 per event per rest area. Examples include flood, fire, hurricane or tornado damage of the rest area facility, failure of a sewage or water treatment plant, etc.

Perform work and provide materials for this contract conforming to the latest version of all Department manuals, standards, specifications, statewide special specifications, policies and procedures and their addenda.

9. **Measurement.** This Item will be measured by the month for the maintenance, operation and repair for each rest area location.

10. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for"Rest Area Total Maintenance, Operation and Repair” for the rest area specified. This price is full compensation for rest area facility enhancement, maintenance and repair, janitorial maintenance, grounds maintenance, landscape upgrading and for furnishing all labor, tools, materials, supplies, equipment and incidentals necessary to complete the work.

The Contractor should be aware that during the term of this contract additional rest areas may be added. The compensation for these new rest areas will be negotiated at that time. In addition, during the term of this contract rest areas may be closed for reconstruction or closed permanently. Payment will not be made for rest areas temporarily or permanently closed.

Contract extensions prices will be negotiated prior to the end of the current contract. Extension increases will not exceed changes in the national consumer price index (developed by the US Department of Labor Statistics).
**Appendix**

**Rest Area Evaluation Form**

<table>
<thead>
<tr>
<th>Traffic/Pavement/Markings</th>
<th>No maintenance required</th>
<th>Minor cleaning required (can be done on the spot)</th>
<th>Dirty or minor repairs required (may be completed same day)</th>
<th>Unacceptable-major repairs or major maintenance required</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Unit</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Signs/supports/delineators</td>
<td></td>
<td></td>
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<tr>
<td>Pavement markings</td>
<td></td>
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</tr>
<tr>
<td>Sidewalks</td>
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</tr>
<tr>
<td>Pavement</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Edges/curbs</td>
<td></td>
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</tr>
<tr>
<td>Guardrail/guardposts</td>
<td></td>
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</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subtotal

|        |        |        |

Subtotal
<table>
<thead>
<tr>
<th>Grounds</th>
<th>No maintenance required</th>
<th>Minor cleaning required(can be done on the spot)</th>
<th>Dirty or minor repairs required(may be completed same day)</th>
<th>Unacceptable-major repairs or major maintenance required</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Units</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Grass (mowing, edging, trimming, raking)</td>
<td></td>
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</tr>
<tr>
<td>Litter</td>
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<tr>
<td>Trees, shrubs</td>
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<tr>
<td>Landscaping</td>
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<tr>
<td>Insect control</td>
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<tr>
<td>Playground</td>
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<tr>
<td>Miscellaneous</td>
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<tr>
<td>Subtotal</td>
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</tr>
<tr>
<td>Outdoor Fixtures</td>
<td>No maintenance required</td>
<td>Minor cleaning required(can be done on the spot)</td>
<td>Dirty or minor repairs required(may be completed same day)</td>
<td>Unacceptable-major repairs or major maintenance required</td>
</tr>
<tr>
<td>15%</td>
<td>Units</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>*Arbors</td>
<td></td>
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<tr>
<td>*Slabs</td>
<td></td>
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<tr>
<td>*Tables</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>*Litter containers</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>*BBQ pits</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>*Water fountains/jug fillers</td>
<td></td>
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</tr>
<tr>
<td>Miscellaneous</td>
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<tr>
<td>Subtotal</td>
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</tr>
</tbody>
</table>

* Count each item in rest area and enter the number in column that applies to how the item rates.
<table>
<thead>
<tr>
<th>Building</th>
<th>No maintenance required</th>
<th>Minor cleaning required (can be done on the spot)</th>
<th>Dirty or minor repairs required (may be completed same day) May be out of service part of day</th>
<th>Unacceptable - Major repairs or items to be replaced or repainted</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Units</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Structure</td>
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<tr>
<td>Information display/arbor</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Entry/lobby (floors, walls, ceilings)</td>
<td></td>
<td>0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat/AC (lobby)</td>
<td></td>
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</tr>
<tr>
<td>Lighting (entry/lobby)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benches</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trash receptacles</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Interactive Displays</td>
<td></td>
<td></td>
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<tr>
<td>Miscellaneous</td>
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<tr>
<td>Subtotal</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Men's Restroom</td>
<td>No maintenance required</td>
<td>Minor cleaning required (can be done on the spot)</td>
<td>Dirty or minor repairs required (may be completed same day) May be out of service part of day</td>
<td>Unacceptable - Major repairs or items to be replaced or repainted</td>
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<td>----------------</td>
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<td>---------------------------------------------------</td>
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<td>---------------------------------------------------------------</td>
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<tr>
<td>25.0%</td>
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</tr>
<tr>
<td>Units</td>
<td>2.5%</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Rating</td>
<td>Total Poss</td>
<td>Sect %</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Sinks
*Hand dryers
*Toilets/urinals
*Toilet paper dispenser
*Mirrors
*Trash receptacles
*Soap dispenser
*Stalls (partisians/doors)
Lighting (inside)
Floors
Ceiling
Walls
Diaper changing area
Heat/AC
Odor/deodorant device
Miscellaneous

* Count each item in rest area and enter the number in column that applies to how the item rates

Subtotal
<table>
<thead>
<tr>
<th>Women's Restroom</th>
<th>No maintenance required</th>
<th>Minor cleaning required (can be done on the spot)</th>
<th>Dirty or minor repairs required (may be completed same day)</th>
<th>May be out of service part of day</th>
<th>Unacceptable - Major repairs or items to be replaced or repainted</th>
</tr>
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<tbody>
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<table>
<thead>
<tr>
<th></th>
<th>Units</th>
<th>3</th>
<th>2</th>
<th>1</th>
<th>0</th>
<th>Rating</th>
<th>Total Poss</th>
<th>Sect %</th>
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<tr>
<td>*Sinks</td>
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<td>*Hand dryers</td>
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<td>*Toilets</td>
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<tr>
<td>*Toilet paper dispenser</td>
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<tr>
<td>*Mirrors</td>
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<td>*Trash receptacles</td>
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<tr>
<td>*Soap dispenser</td>
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<tr>
<td>*Stalls (partisians/doors)</td>
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<tr>
<td>*Sanitary napkin receptacles</td>
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<tr>
<td>Lighting (inside)</td>
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<tr>
<td>Floors</td>
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<td>Ceiling</td>
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<td>Walls</td>
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<tr>
<td>Diaper changing area</td>
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<tr>
<td>Heat/AC</td>
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<td></td>
</tr>
<tr>
<td>Odor/deodorant device</td>
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<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Count each item in rest area and enter the number in column that applies to how the item rates

Subtotal | 0
<table>
<thead>
<tr>
<th>Assisted Use Restroom</th>
<th>No maintenance required</th>
<th>Minor cleaning required (can be done on the spot)</th>
<th>Dirty or minor repairs required (may be completed same day)</th>
<th>May be out of service part of day</th>
<th>Unacceptable - Major repairs or items to be replaced or repainted</th>
<th>When assisted use restrooms apply, they will carry 10% of the total and the women's and men's restrooms will carry 20% each</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>Units</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>Rating</td>
</tr>
<tr>
<td>Sinks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand dryers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilets</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilet paper dispenser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirrors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trash receptacle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soap dispenser</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanitary napkin receptacle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lighting (inside)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Floors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ceiling</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walls</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diaper changing area</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heat/AC</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odor/deodorant device</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Miscellaneous</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<p>| Subtotal              |                          |                                                   |                                                             |                                 |                                                               |        |            |        |</p>
<table>
<thead>
<tr>
<th>Attendants/ Required Documentation</th>
<th>Meets contract requirements</th>
<th>Minor areas do not meet contract requirements</th>
<th>Borderline in meeting contract requirements</th>
<th>Does not meet contract requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>5%</td>
<td>Units</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>

| Attendant(s)                      |                             |                                               |                                             |                                 |                                 |        |            |        |
| Diary/MSDS                       |                             |                                               |                                             |                                 |                                 |        |            |        |
| Storage area                     |                             |                                               |                                             |                                 |                                 |        |            |        |

|                                        | Subtotal                    |                                               |                                             |                                 |                                 |        |            |        |
|                                        | Grand Total                 |                                               |                                             |                                 |                                 |        |            |        |
Exhibit C.4

TxDOT: Performance Results from 2010

This information was located at the main TxDOT website in the 2010 performance results report. For the entire report please see the report located at:
<http://www.txdot.gov/about_us/sppm/measures.htm>

Reference:

Used with permission by TxDOT.
## GOAL: REDUCE CONGESTION

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>FY 2009 Results</th>
<th>FY 2010 Results</th>
<th>Progress</th>
<th>FY 2010 Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Construction Projects Completed On Time</td>
<td>70%</td>
<td>78%</td>
<td>↑</td>
<td>74%</td>
<td>Although the department exceeded the performance target set in state law, it continues to identify areas for improvement.</td>
</tr>
<tr>
<td>Construction Projects Completed On Budget</td>
<td>91.37%</td>
<td>91.74%</td>
<td>↑</td>
<td>97%</td>
<td>The department’s performance increased slightly from FY 2009 to FY 2010.</td>
</tr>
<tr>
<td>Design Projects Delivered On Time</td>
<td>NA</td>
<td>76%</td>
<td>NA</td>
<td>90%</td>
<td>The department expects to improve performance every year to approach its long term goal of 100%.</td>
</tr>
<tr>
<td>Design Projects Delivered On Budget</td>
<td>22%</td>
<td>41%</td>
<td>↑</td>
<td>50%</td>
<td>TxDOT has evaluated its design project estimating procedures and made quality control process improvements evident in this year’s performance.</td>
</tr>
<tr>
<td>Percent of Projects Awarded On Schedule</td>
<td>93%</td>
<td>100+%</td>
<td>↑</td>
<td>100%</td>
<td>For FY 2010, the percent of projects awarded on schedule actually exceeded 100%.</td>
</tr>
<tr>
<td>Right of Way Budget</td>
<td>88.6%</td>
<td>49.8%</td>
<td>↓</td>
<td>97-103%</td>
<td>Project management tools have improved the timing of acquisitions in order to optimize expenditures. The unexpended balances in FY 2010 will be transferred forward to FY 2011, where the amount is anticipated to be spent in full.</td>
</tr>
<tr>
<td>Right of Way Acquisition</td>
<td>81%</td>
<td>78.3%</td>
<td>↓</td>
<td>NA</td>
<td>The agency successfully acquired 1,073 parcels in FY 2010.</td>
</tr>
</tbody>
</table>

↑ Up arrow indicates performance trend is favorable.
↓ Down arrow indicates performance trend is unfavorable.
← Left-Right arrow indicates performance trend is holding steady.
### GOAL: ENHANCE SAFETY

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>FY 2009 Results</th>
<th>FY 2010 Results</th>
<th>Progress</th>
<th>FY 2010 Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fatality Rate</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of fatalities / 100 million VMT</td>
<td>1.48 (CY 2008)</td>
<td>1.34 (CY 2009)</td>
<td></td>
<td>1.38</td>
<td></td>
</tr>
<tr>
<td><strong>Roadways with Improved Shoulders</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of two-lane roads with shoulders</td>
<td>55.9% (CY 2009)</td>
<td>56.8% (CY 2010)</td>
<td></td>
<td>54.2%</td>
<td></td>
</tr>
<tr>
<td><strong>Railroad Crossings Signalization</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of railroad crossings with signalization</td>
<td>57.0%</td>
<td>57.8%</td>
<td></td>
<td>56.8%</td>
<td></td>
</tr>
<tr>
<td><strong>Traffic Assessment Condition Score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Texas Traffic Assessment Program condition score</td>
<td>84.44</td>
<td>87.56</td>
<td></td>
<td>86.5</td>
<td></td>
</tr>
</tbody>
</table>

### GOAL: EXPAND ECONOMIC OPPORTUNITY

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>FY 2009 Results</th>
<th>FY 2010 Results</th>
<th>Progress</th>
<th>FY 2010 Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TxDOT On-Budget</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual expenditures / total appropriations</td>
<td>95.86%</td>
<td>81.13%</td>
<td></td>
<td>97-103%</td>
<td></td>
</tr>
<tr>
<td><strong>State Highway Fund (Fund 6) Revenue Forecast</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projected revenues to actual revenues</td>
<td>97.13%</td>
<td>100.46%</td>
<td></td>
<td>97-103%</td>
<td></td>
</tr>
<tr>
<td><strong>HUB Activity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of all contract funds awarded to HUBs</td>
<td>10.7%</td>
<td>12.8%</td>
<td></td>
<td>See report for categories</td>
<td></td>
</tr>
<tr>
<td><strong>Project to Funding Ratio</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dollar volume of highway projects delayed in the fiscal year</td>
<td>1.03</td>
<td>1.04</td>
<td></td>
<td>1.15</td>
<td></td>
</tr>
<tr>
<td><strong>Small Urban and Rural Public Transit Trips</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% change in non-metro transit trips</td>
<td>5%</td>
<td>8.77%</td>
<td></td>
<td>1%</td>
<td></td>
</tr>
<tr>
<td><strong>Yearly Letting Caps to Actual Letting Caps (State Highway Fund)</strong></td>
<td>75%</td>
<td>88%</td>
<td></td>
<td>97-103%</td>
<td></td>
</tr>
</tbody>
</table>

© The data suggests that TxDOT is making steady progress in improving the condition and safety of two-way, two-lane highways.

© Performance exceeded target for FY 2010. The department predicts the statewide condition score will level out over the next 3-4 years.

© The department has spent 81.13% of the total appropriation established by state law for FY 2010. It is anticipated that the department will not expend the total appropriation amount for FY 2010 due to cash flow issues and reduced spending.

© Performance is on target.

© The department increased contracted dollars to HUBs by approximately 2%.

© Based on current economic conditions and the recent levels of funding, TxDOT anticipates that the department will continue to have more projects available for award than can be awarded.

© Performance is exceeding target, mainly due to increased university student ridership in College Station and Lubbock. The agency anticipates continuing progress but at a slower pace in the future.

© Reflects letting amounts from State Highway Fund revenues only. The primary reason for the 12% variance between the originally set letting cap and the actual dollar volume of projects awarded is due to an economic climate that resulted in unanticipated, lower bid amounts from the contracting community.
## GOAL: IMPROVE AIR QUALITY

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>FY 2009 Results</th>
<th>FY 2010 Results</th>
<th>Progress</th>
<th>FY 2010 Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Greenhouse Gas Emissions</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TxDOT fleet gas emissions</td>
<td>111,458 metric tons</td>
<td>107,433 metric tons</td>
<td>🟢</td>
<td>Less than 110,458 metric tons (1% Reduction)</td>
<td>The department continues to experience positive results year after year through the purchase of green vehicles and equipment.</td>
</tr>
</tbody>
</table>

## GOAL: PRESERVE TRANSPORTATION ASSETS

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>FY 2009 Results</th>
<th>FY 2010 Results</th>
<th>Progress</th>
<th>FY 2010 Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pavement Condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of pavement in good or better condition</td>
<td>85.9%</td>
<td>87.0%</td>
<td>🟢</td>
<td>90%</td>
<td>TxDOT expects that Condition Scores will slightly improve due to the ARRA funding spent during the Spring and Summer of 2010, and TxDOT’s initiatives to improve pavement maintenance practices.</td>
</tr>
<tr>
<td><strong>Bridge Condition</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>% of bridges in good or better condition</td>
<td>79.6%</td>
<td>80.3%</td>
<td>🟢</td>
<td>80.4%</td>
<td>Assuming current trends, TxDOT expects to reach 81.0% by 2011.</td>
</tr>
<tr>
<td><strong>Roadway Surface Treatments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of actual lane miles surfaced compared to planned</td>
<td>97%</td>
<td>99%</td>
<td>🟢</td>
<td>100%</td>
<td>TxDOT uses this information to determine if the current amount of pavement preservation funding is adequate to preserve the life of the state highway system.</td>
</tr>
<tr>
<td><strong>Texas Maintenance Assessment Program</strong></td>
<td>76.91</td>
<td>78.45</td>
<td>🟢</td>
<td>80</td>
<td>Scores for interstate conditions have exceeded target over the past 10 fiscal years. However, the overall system condition scores (interstate and non-interstate combined) falls short of the target.</td>
</tr>
</tbody>
</table>
## EXTERNAL PERFORMANCE INDICATORS

<table>
<thead>
<tr>
<th>Performance Measure</th>
<th>FY 2009 Results</th>
<th>FY 2010 Results</th>
<th>Progress</th>
<th>FY 2010 Target</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vehicle Miles Traveled</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roadway utilization</td>
<td>235 billion</td>
<td>231 billion</td>
<td>NA</td>
<td>NA</td>
<td>In recent years, the statewide VMT has slightly decreased while population continued to increase. The results indicate a general public trend in reducing vehicle miles traveled.</td>
</tr>
<tr>
<td><strong>Urban Congestion Index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment of extra travel time in four largest urban areas</td>
<td>1.40</td>
<td>1.40</td>
<td>↔️</td>
<td>Less than 1.45</td>
<td>The 2010 results indicate the congestion conditions in the four transportation management areas of Texas have not significantly changed from 2009 to 2010.</td>
</tr>
<tr>
<td><strong>Statewide Congestion Index</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment of extra travel time in the 17 smaller urban areas</td>
<td>1.10</td>
<td>1.10</td>
<td>↔️</td>
<td>Less than 1.10</td>
<td>The congestion level for all 17 areas is unchanged from the previous reporting year.</td>
</tr>
<tr>
<td><strong>CTTS Forecasting Accuracy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual vs. forecast revenue for Central Texas Turnpike System</td>
<td>118.7%</td>
<td>110.8%</td>
<td>↑️</td>
<td>97-103%</td>
<td>Traffic volume and toll revenues continue to exceed projections.</td>
</tr>
</tbody>
</table>


Exhibit C.5

TxDOT: TxMAP Element Scoring Descriptions

This information is used during inspections to rate roadway elements. Ms. Brandye Munn of TxDOT provided this information thru email.

Reference:

Munn, Brandye. Personal interview. 6 June 2011.

Used with permission by Brandye Munn,
# TxMAP Scoring System

Ratings are based upon the following conditions:

<table>
<thead>
<tr>
<th>Component</th>
<th>Excellent</th>
<th>Good</th>
<th>Fair</th>
<th>Poor</th>
<th>Failed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asphalt Pavement</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Rutting</td>
<td>No rutting</td>
<td>Minor &lt; ¼” flaming, Rock wearing</td>
<td>Moderate (¼” to ½”) May be able to feel when crossing in vehicle</td>
<td>Major (&gt; ½” to 1”)</td>
<td>Severe (&gt; 1”)</td>
</tr>
<tr>
<td>Cracking</td>
<td>No cracking</td>
<td>Minor cracking (tight cracking that a seal would cover). All cracks sealed and no sealed areas wider than 3”</td>
<td>Moderate cracking (cracking wide enough to be crack sealed). Minor cracking thru out the section. All cracks sealed and sealed areas are wider than 3”.</td>
<td>Major cracking (cracks wider than ½”). Moderate cracking throughout the section. May have some pumping or may have some squeegee seal areas.</td>
<td>Severe cracking (cracks wider than 1”). Major cracking throughout section. Substantial pumping and substantial squeegee seal areas.</td>
</tr>
<tr>
<td>Failures</td>
<td>No repairs of any type.</td>
<td>All patched and repaired areas are smooth and level. Small depressed areas, (gopher runs, settled areas, ant towns or etc.)</td>
<td>Moderate failures (small areas that have minor pavement movement and/or tight cracking, that you will need to dig in near future). Several small depressed areas. Un-level repairs. Small open potholes.</td>
<td>Major failures (areas in need of repair, that have cracking and may have some pavement movement, needs repairs now). Has several moderate failures. Large open potholes.</td>
<td>Severe failure (areas that have loose pavement or missing pavement). Several major failures.</td>
</tr>
<tr>
<td>Ride (Settlement)</td>
<td>Very smooth with no humps, bumps or depressions</td>
<td>Smooth with few minor humps, bumps or depressions. All patches are smooth and level.</td>
<td>Adequate with several minor humps, bumps or depressions. Some repairs are not smooth and level. May have 3 moderate humps, bumps or depressions (will feel sharpness in vehicle).</td>
<td>Rough with many moderate humps, bumps or depressions. Most repairs are not smooth and level. May have 2 locations that you feel the vehicle bottom out.</td>
<td>Unacceptable, causing a reduction in speed (Example: Open failure).</td>
</tr>
<tr>
<td>Edges</td>
<td>No repairs made. May have complete edge seal.</td>
<td>Minor drop-offs (short lengths &lt; 50’ and &lt; 2’ deep) and/or minor broken edge (areas &lt; 100’ and up to 3” wide). All repaired.</td>
<td>Moderate drop-offs (short areas of &lt; 50’ and 2” to 4” deep. Long areas of minor drop-offs. Moderate broken edge (areas under 100’ and up to 6” wide). Long areas of minor broken edge. Not all repaired</td>
<td>Major drop-offs (over 4” to 6’). Long areas of moderate drop-offs. Major broken edge (areas over 6” wide). Long areas of moderate broken edge.</td>
<td>Severe drop-offs (over 6’). Long areas of major drop-offs. Long areas of major broken edge.</td>
</tr>
<tr>
<td>-------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Shoulders</td>
<td>Very good condition no repairs made.</td>
<td>Pavement in good condition (few repairs) or very few repairs needed.</td>
<td>Pavement in fair condition (several repairs). Some minor repairs needed.</td>
<td>Pavement in poor condition major repairs needed.</td>
<td>Pavement is coming apart.</td>
</tr>
<tr>
<td>Concrete Pavement</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Rutting</td>
<td>Concrete Pavement will not be rated</td>
<td>Has typical tight transverse cracking on 3’ - 6’ spacing.</td>
<td>Minor cracking, (typical transverse cracking on 3’ - 6’ spacing with very minor spalls along cracks). May have a very few tight transverse cracks.</td>
<td>Moderate cracking (most transverse cracking closer than the typical 3’ - 6’ spacing). May have a very few minor longitudinal cracks.</td>
<td>Major cracking (transverse or longitudinal cracks that are wide enough to be sealed with some minor spalling.) A large amount of moderate cracking. More unsealed than sealed.</td>
</tr>
<tr>
<td>Cracking/CRCP</td>
<td>No cracking</td>
<td>Minor cracking (a few tight transverse or longitudinal cracks). All cracks sealed, none wider than 3”.</td>
<td>Moderate cracking (transverse or longitudinal cracks that are wide enough to be sealed). A large amount of minor cracking. Some sealed and some unsealed. All cracks sealed,</td>
<td>Major cracking (transverse or longitudinal cracks that are wide enough to be sealed with some minor spalling.) A large amount of moderate cracking. More unsealed than sealed.</td>
<td>Severe cracking (wide transverse and longitudinal cracking, some may have minor pop outs.)</td>
</tr>
<tr>
<td>Cracking/JCP</td>
<td>No cracking</td>
<td>Minor cracking (a few tight transverse or longitudinal cracks). All cracks sealed, none wider than 3”.</td>
<td>Moderate cracking (transverse or longitudinal cracks that are wide enough to be sealed). A large amount of minor cracking. Some sealed and some unsealed. All cracks sealed,</td>
<td>Major cracking (transverse or longitudinal cracks that are wide enough to be sealed with some minor spalling.) A large amount of moderate cracking. More unsealed than sealed.</td>
<td>Severe cracking (wide transverse or longitudinal cracks &gt; ¾”. A large amount of major cracking.)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>some wider than 3”</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
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<td>------------</td>
<td>------------</td>
<td></td>
</tr>
<tr>
<td><strong>Failures</strong></td>
<td>No pop outs or punch outs. No repairs.</td>
<td>All repairs are smooth and level. No asphalt patches. No more than 3 very small pop outs (small pieces missing pavement, may be by joints)</td>
<td>Some rough repairs. May have some small pop outs patched with asphalt. More than 3 very small pop outs. No more than 3 small low severity punch outs (longitudinal and transverse cracks are tight and will have minor spalling)</td>
<td>More than 3 small low severity punch outs. No more than 3 moderate severity punch outs (longitudinal and transverse cracks are wide and will have spalling, needs repair in near future)</td>
<td>More than 3 moderate severity punch outs. Any high severity punch out (longitudinal and transverse cracks are wide and concrete will move under traffic or is missing)</td>
</tr>
<tr>
<td><strong>Ride</strong></td>
<td>Ride smooth with no humps, bumps or rough joints</td>
<td>Smooth with few minor humps, bumps or rough joints. All repairs are smooth and level.</td>
<td>Adequate with several minor humps, bumps or rough joints (will feel sharpness in vehicle)</td>
<td>Rough with many moderate humps, bumps or rough joints. Most repairs are not smooth and level. May have 2 locations that you feel the vehicle bottom out.</td>
<td>Unacceptable causing a reduction in speed (Example: open punch outs)</td>
</tr>
<tr>
<td><strong>Edges</strong></td>
<td>No repairs made</td>
<td>Minor drop-offs (short lengths less than 50” and less than 2” deep) and/or all repaired.</td>
<td>Moderate drop-offs (short areas of less than 50” and 2” to 4” deep) Long areas of minor drop-offs. Not all repaired</td>
<td>Unacceptable drop-offs &gt; 50 feet in length and 2” to &lt; 4”</td>
<td>Unacceptable drop-offs &gt; 4”</td>
</tr>
<tr>
<td><strong>Shoulders</strong></td>
<td>Very good condition, no repairs made</td>
<td>Pavement in good condition (few repairs) or very few repairs needed</td>
<td>Pavement in fair condition (several repairs). Some minor repairs needed.</td>
<td>Pavement in poor condition, major repairs needed.</td>
<td>Pavement is coming apart.</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>----------------------------------------</td>
<td>----------------------------------------</td>
<td>------------------------------------</td>
<td>----------------------------------------</td>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Raised Pavement Markers</td>
<td>Markers like new with none missing. Placed on standard placement.</td>
<td>Most in place, may have a few missing or obviously non-reflective, cracked or pressed into adhesive.</td>
<td>Most in place, maximum of 10% missing or obviously non-reflective, cracked or pressed into adhesive or adhesive over reflective face.</td>
<td>Many missing, maximum of &lt;25% missing or obviously non-reflective, cracked or pressed into adhesive or adhesive over reflective face.</td>
<td>Most &gt;25% missing or non-reflective or no markers installed</td>
</tr>
<tr>
<td>Large Signs</td>
<td>Signs like new, with all background, lettering, borders and shields clean and reflective. No damage.</td>
<td>Signs generally good; background, lettering, borders and shields may be slightly faded. May have very minor damage.</td>
<td>Signs borderline acceptable; background, lettering, borders and shields may be slightly faded or mildewed. May have some damage.</td>
<td>Signs unacceptable with dirt or mildew. May be faded or have substantial damage. May have one or two high or low bases.</td>
<td>Signs totally unacceptable with severe dirt, mildew or fading. May be damaged or totally knocked down. Several bases are high or low.</td>
</tr>
<tr>
<td>Small Signs</td>
<td>Signs like new, on standard posts, no repairs needed. All straight</td>
<td>All on standard supports. Very minor repairs needed. All required signs are in place. No high or low bases. Most are straight</td>
<td>All on standard supports, &lt; 50% leaning or with dirty, damaged or bad sign faces. No high or low bases.</td>
<td>All on standard supports, most leaning or dirty, damaged or bad sign faces. One non-regulatory maybe missing. Some may have high or low bases.</td>
<td>Signs not on standard supports or any regulatory sign missing or more than one other sign missing. MOST ALL are leaning and bad or damaged sign faces.</td>
</tr>
</tbody>
</table>

<p>| Large Signs (Installed on I or H beams or sign bridge) | Signs like new, with all background, lettering, borders and shields clean and reflective. No damage. | Signs generally good; background, lettering, borders and shields may be slightly faded. May have very minor damage. | Signs borderline acceptable; background, lettering, borders and shields may be slightly faded or mildewed. May have some damage. | Signs unacceptable with dirt or mildew. May be faded or have substantial damage. May have one or two high or low bases. | Signs totally unacceptable with severe dirt, mildew or fading. May be damaged or totally knocked down. Several bases are high or low. |</p>
<table>
<thead>
<tr>
<th><strong>Striping Graphics</strong></th>
<th>New or like new. All required graphics are in place and like new</th>
<th>Stripes in very good shape with no obvious loss of reflectivity. All required graphics are in good condition</th>
<th>Stripes in acceptable shape with some cracking or minor loss of reflectivity. May have crack seal slightly obscuring some stripe. Required graphics are present.</th>
<th>Stripes unacceptable with cracking, fading, or severely worn. May be substantially covered with crack seal material. Needs to be replaced. Graphics are missing.</th>
<th>Stripes totally unacceptable with severe cracking, fading or severely worn. Major loss of reflectivity. ANY road with out a stripe.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Attenuator</strong></td>
<td>New or like new to current standards with no damage.</td>
<td>Attenuator not damaged; may not be latest standard.</td>
<td>Attenuator functional but with very minor damage. May need painting.</td>
<td>Attenuator with moderate damage but will still function as designed.</td>
<td>Attenuator that will not function as designed.</td>
</tr>
<tr>
<td><strong>Delineators</strong></td>
<td>Delineators, new or like new, straight, installed in accordance with standards. No repairs needed.</td>
<td>Delineators posts &lt;50% slightly leaning or with some damaged and non reflective delineators</td>
<td>Delineators &lt;50% slightly leaning and &lt;50% delineators damaged or non reflective, or most post slightly leaning, or most delineators non reflective.</td>
<td>Most post slightly leaning and delineators non reflective or one or two post bent, broken, down or missing.</td>
<td>Several bent, broken damaged or missing. Not installed in accordance with standards</td>
</tr>
<tr>
<td><strong>Roadside</strong></td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Vegetation Management</strong></td>
<td>Vegetation recently mowed or of uniform height. No noxious weeds. No grass in pavement. May contain “non-mow” areas.</td>
<td>Vegetation generally good, of uniform height and with very little noxious weeds, May have obvious signs of herbicide application. May contain “non-mow” areas.</td>
<td>Vegetation acceptable. May have some small stands of Johnson grass or other noxious weeds. or have grass along edge of pavement or in some cracks. No sight distance problems. May contain “non-mow” areas.</td>
<td>Vegetation needs mowing with large stands of Johnson grass or other noxious weeds or have grass along edge of pavement. May have minor sight distance problems.</td>
<td>Vegetation unacceptable. Large stands of Johnson grass or other noxious weeds. May have severe sight distance problems. Grass is over one foot into edge of pavement.</td>
</tr>
</tbody>
</table>

(OM3 or delineators)

**Vegetation Management** (Do not rate in C/G section)
<p>| Litter (Do not rate in C/G section) | ROW clean with no or very minor litter. Litter not visible at posted speed limit. | ROW generally clean with only a few pieces of litter or debris visible at posted speeds. | ROW acceptable with one or two objectionable spots of litter or debris. Several single pieces of litter, or debris. | ROW unacceptable, with much litter or debris. | ROW totally unacceptable with large quantities of litter or debris. |
| Sweeping (Rate as needed) | Clean, no dirt debris or ice rock along curbs, bridges, turn lanes, or barriers. | Very minor dirt, ice rock, or debris along curbs, turn lanes, bridges, or barriers. | Some debris, dirt or minor ice rock on bridges, along curbs, turn lanes or barriers. | Substantial quantities of dirt, debris and/or ice rock built up along barriers, turn lanes, curbs or bridges. May cause minor drainage problem. | Debris built up along curbs, turn lanes, or bridges that would cause a hazard or drainage problem. |
| Trees and Brush (Do not rate in C/G section) | Trees trimmed to allow mowing beneath. No sight restrictions or sign obstructions. ROW neat. No trees in clear zone. | Trees generally trimmed. No sight restrictions or sign obstructions. May have some minor brush or trees in need of trimming. | Trees and brush may have substantial growth. No sight restrictions or sign obstructions. May have a few trees within clear zone. | Trees and brush unkept. Tree limbs encroaching onto pavement or large trees &gt; 5” within clear zone. May have sight restrictions or sign obstructions. | Trees and brush unkept. Tree limbs encroaching onto travel lanes or large trees &gt; 5” within clear zone. Has sight restrictions and/or sign obstructions. |
| Drainage (Do not rate in C/G section) | Ditches and channels like originally constructed, clear of silt or erosion. Vegetation as appropriates in ditches. No high shoulders. | Ditches and channels like originally constructed may have minor silt or erosion. Vegetation as appropriates in ditches. Minor spots of high shoulders. | Ditches and channels like originally constructed, may have some silt or erosion (pipes 50% full). Vegetation as appropriates in ditches. Several areas of high shoulders. | Substantial erosion or siltation in ditches or channels. Does not function as designed. Potential exists for additional erosion. High shoulders may trap water on pavement. Washouts around culverts, bridges and etc. | Extreme erosion or siltation in ditches or channels. Does not function as designed. Potential exists for additional erosion. Erosion has created a safety hazard. High shoulders may trap water in travel lanes. |</p>
<table>
<thead>
<tr>
<th><strong>Encroachments Access Control</strong> (Do not rate in C/G section)</th>
<th>No illegal signs, buildings, or vehicles encroaching on highway ROW. No apparent or frequent access control violations.</th>
<th>May have a few illegal signs, buildings, or vehicles slightly encroaching onto ROW. Does not cause a safety problem. May have very minor or infrequent access control violations.</th>
<th>May have illegal signs, buildings or vehicles encroaching onto ROW. They should not cause a safety problem, however it is apparent they have been there for a long period of time. May have one minor access control violation.</th>
<th>Has illegal signs, buildings or vehicles encroaching onto ROW. They are causing a safety problem and should be removed. May have one obvious access control violation.</th>
<th>Has illegal signs, buildings or vehicles encroaching onto ROW. They are causing a safety problem and should be removed. Has more than one obvious access control violation.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Guardrail</strong> (Rate as needed)</td>
<td>Guardrail like new, appropriately placed, installed to the latest standards.</td>
<td>Guardrail all functional. May have one minor dent or may not be the latest standard.</td>
<td>Guardrail all functional with several minor dents or out of alignment.</td>
<td>Guardrail has been hit and is not functional. Guardrail has standup ends instead of turn down or turn down instead of GET. Guardrail is low.</td>
<td>Guardrail has major damage and should be repaired as soon as possible. Guardrail is required and not installed at bridge ends.</td>
</tr>
<tr>
<td><strong>Mailboxes</strong></td>
<td>Mailboxes straight, all on standard supports and hardware, with standard delineation.</td>
<td>Mailboxes all on standard supports and hardware, with standard delineation. Some leaning</td>
<td>Mailboxes all on standard supports and hardware. Many leaning, some may not have standard delineation.</td>
<td>One or two mailboxes on non-standard supports. Most other boxes are too standard. Missing or incorrect delineation</td>
<td>Several mailboxes on non-standard supports, some are safety problems, most other not to standard</td>
</tr>
<tr>
<td>Public Rating</td>
<td>Ride smooth, quiet, pavement with no crack sealing or patches, all required signs straight and clean, good striping and RPM’s, no litter, vegetation of uniform height,</td>
<td>Ride generally smooth with little road noise, crack sealing, or patches, few signs may be leaning slightly, good striping and RPM’s, minor litter, vegetation of uniform height</td>
<td>Ride may be slightly rough, crack sealing and/or patched, signs leaning, Non required signs missing, minor litter, striping and RPM’s borderline vegetation borderline with small amount of noxious weeds.</td>
<td>Ride rough, pavement may have some minor unrepairs failures, leaning or faded signing, missing required signs, lot of litter, vegetation needs mowing and/or herbicide work, striping or RPM’s bad, ruts may hold water..</td>
<td>Pavement condition may cause damage to vehicles, severe rutting holding water, signing faded and leaning, or missing regulatory signs, unacceptable amount of litter on shoulders and roadside, vegetation totally unacceptable, striping and RPM’S very bad or missing</td>
</tr>
</tbody>
</table>
Exhibit C.6

TxDOT: TxMAP Sample Inspection Sheet

This is the inspection sheet used by the overall maintenance division when conducting inspections. A modified, project specific, sheet can be seen in C.2.

Reference:

**Texas Maintenance Condition Assessment Inspection Report**

**DISTRICT/SECTION** Lubbock / 7

**COUNTY** Lamb

**HIGHWAY** FM0054

**INSPECTOR** Carla Baze, Rickey Gates

**ACCOMPANIED BY** Al Houston, Roberto Cardoza, Ja

**FISCAL YEAR** 2006

**ASSESSMENT #** 7965

**INSPECTION** 13033

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**Element Scores**

Each non-zero score is accessed a maximum of 5.

Not applicable scores = 0.

Total scores are derived from dividing the accessed score by the maximum score.

Applicable scores = 1(20%); 2(40%); 3(60%); 4(80%); 5(100%)

**Priority Multiplier**

Each element is assigned a weighted factor of priority with that component class.

The element score is multiplied by the priority multiplier to create the component score.

**Component Overall Rating**

Component Overall Rating Score = Total Component Scores / Total Priority Multipliers

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**Inspection Scores**

The inspection score is the sum of the Pavement Weighted Score, Traffic Operations Weighted Score, and Roadside Weighted Score.

**PAVEMENT WEIGHT FACTOR** = 50%

**TRAFFIC OPERATIONS WEIGHT FACTOR** = 20%

**ROADSIDE WEIGHT FACTOR** = 30%

---

**Component/Element**

<table>
<thead>
<tr>
<th>Component/Element</th>
<th>Rating</th>
<th>Element Score</th>
<th>Priority Multiplier</th>
<th>Component Score</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pavement</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Main Lane - Rutting</td>
<td>4</td>
<td>80%</td>
<td>6.5</td>
<td>5.20</td>
</tr>
<tr>
<td>Main Lane - Cracking</td>
<td>5</td>
<td>100%</td>
<td>6.5</td>
<td>6.50</td>
</tr>
<tr>
<td>Main Lane - Failures</td>
<td>4</td>
<td>80%</td>
<td>9</td>
<td>7.20</td>
</tr>
<tr>
<td>Main Lane - Ride</td>
<td>4</td>
<td>80%</td>
<td>6</td>
<td>4.80</td>
</tr>
<tr>
<td>Edges</td>
<td>5</td>
<td>100%</td>
<td>4.5</td>
<td>4.50</td>
</tr>
<tr>
<td>Shoulders</td>
<td>5</td>
<td>100%</td>
<td>5</td>
<td>5.00</td>
</tr>
</tbody>
</table>

**Pavement Component Score** 33.20 / 37.50 = 88.53%

---

**Traffic Operations**

<table>
<thead>
<tr>
<th>Component/Element</th>
<th>Rating</th>
<th>Element Score</th>
<th>Priority Multiplier</th>
<th>Component Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Raised Pavement Markers</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Signs - Large</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Signs - Small</td>
<td>5</td>
<td>100%</td>
<td>3</td>
<td>3.00</td>
</tr>
<tr>
<td>Striping, Pavement Graphics</td>
<td>5</td>
<td>100%</td>
<td>4</td>
<td>4.00</td>
</tr>
<tr>
<td>Attenuators</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Delineators</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Traffic Operations Component Score** 7.00 / 7.00 = 100.00%

---

**Roadside**

<table>
<thead>
<tr>
<th>Component/Element</th>
<th>Rating</th>
<th>Element Score</th>
<th>Priority Multiplier</th>
<th>Component Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetation Management</td>
<td>5</td>
<td>100%</td>
<td>5.5</td>
<td>5.50</td>
</tr>
<tr>
<td>Litter</td>
<td>5</td>
<td>100%</td>
<td>2.5</td>
<td>2.50</td>
</tr>
<tr>
<td>Sweeping</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Trees and Brush</td>
<td>5</td>
<td>100%</td>
<td>3.5</td>
<td>3.50</td>
</tr>
<tr>
<td>Drainage</td>
<td>5</td>
<td>100%</td>
<td>5</td>
<td>5.00</td>
</tr>
<tr>
<td>Encroachments</td>
<td>5</td>
<td>100%</td>
<td>3.5</td>
<td>3.50</td>
</tr>
<tr>
<td>Guard Rails</td>
<td>0</td>
<td>0%</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Mail Boxes</td>
<td>4</td>
<td>80%</td>
<td>3</td>
<td>2.40</td>
</tr>
<tr>
<td>General Public Rating</td>
<td>5</td>
<td>100%</td>
<td>10</td>
<td>10.00</td>
</tr>
</tbody>
</table>

**Roadside Component Score** 32.40 / 33.00 = 98.18%

**INSPECTION OVERALL RATING** 93.72%

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Exhibit C.7

TxDOT: Special Specification for Snow and Ice Control

This specification complements the “Routine Maintenance and Operations of Highways” contract in Waco, Texas. There are other special specification online at the Texas Expressway database. Log on to the main TxDOT website and search “Specifications” for the database link.

Reference:


Used with permission by Tammy Sims.
SPECIAL SPECIFICATION

7551

Snow and Ice Control

1. **Description.** Treat bridges and designated locations with de-icing material.

2. **General.** Trucks, loaders, spreaders, and other equipment as approved by the Engineer shall be fully equipped and ready for use as outlined herein.

   The number of hours of use will vary with the number and severity of winter storms. Contractor will mobilize at the discretion of the Engineer. Depending on the storm event the Engineer may direct a full or partial mobilization.

3. **Materials.** Deicing materials will be provided by the Department. Department stockpile locations will be located in Hillsboro, Waco, and Belton. Deicing material will consist of granular Meltdown 20 and sand.

4. **Equipment and Personnel.** Furnish the following equipment for a full mobilization unless otherwise directed by the Engineer:

   a) A minimum of twelve (12) trucks with 10 yard capacity (including personnel) equipped with 14’ "V" Bottom, self contained aggregate spreader with an approximate loaded weight of 24,000 lb. and a remote in-cab control. Trucks shall generally be divided between the stockpile locations (4 trucks at each stockpile). However, the Engineer may shift truck locations as necessary.

   Contractor may submit for the approval the Engineer the use of other types of spreader equipment. Submittal shall include type of equipment, rate of application, capacity, and other information as requested by the Engineer.

   b) Provide a shadow vehicle equipped with a truck mounted attenuator and arrow board for each slow mowing operation in accordance with TCP(3-2)-98.

   c) One front end loader equipped with a 2 yard minimum bucket or equivalent equipment capable of loading material (including personnel) at each stockpile location.

   d) All labor, tools, fuel, tire chains, equipment transportation, safety equipment and any other items necessary to complete the work.

   Provide operators with appropriate driver’s licenses. Maintain equipment in good working condition. Furnish backup operators and equipment. Be prepared to work continuously 24 hours a day.
Contractor shall have a supervisor on duty for all snow and ice events. Supervisor shall perform as the Department’s point of contact. Supervisor shall maintain the ability to communicate with the Department and contractor personnel.

**Warning Lights.** Traffic control for snow and ice shall be in accordance with TCP(3-2)-98, “Mobile Operations Divided Highways”. Shadow vehicles are required for all slow moving operations. Shadow vehicles shall be equipped with warning lights, truck mounted attenuator, arrow board, and sign CW21-10, “Work Convoy”. Work vehicle shall be equipped with warning lights. Trail vehicle and ramp control vehicle are not required

5. **Methods of Operation.** Contractor will be allowed a maximum of two (2) hours to mobilize equipment and personnel and report for work at the designated stockpile locations. The time to mobilize will begin at the first attempt of notification. Failure to mobilize in two (2) hours will result in the assessment of disincentives as noted in the General Notes.

Contractor shall provide one (1) treatment of all freeway mainlane bridges. Contractor shall continue treatment of bridges, steep grades, sharp curves, intersections and other trouble spots as directed by the Engineer throughout the duration of the event. The Department will monitor weather conditions and request additional treatments as necessary.

The application rate for de-icing material will be determined by the Engineer.

Unless otherwise approved, personnel will be limited to a maximum of 12 hours of operation during any 24 hour time period. Furnish backup personnel as needed.

**Post Storm Reporting.** Immediately after a storm event, contractor shall report the following information to the Engineer:

a) total man-hours worked,

b) amount of de-icing material applied (cy),

c) other information as requested by the Engineer.

**Failure to Respond.** Failure to respond to the notification by the Engineer to mobilize within 2 hours of notification and continually perform work as directed will result in the assessment of penalties as noted in the General Notes.

6. **Measurement.** Work will be measured by the hour for each truck, shadow vehicle, and loader. Partial hours will be rounded to the nearest on-half hour of work performed. Time charges begins when the contractor is requested to mobilize and ends when work is complete and the Engineer has determined that winter weather event is no longer a hazard to the traveling public and authorizes full or partial demobilization.

7. **Payment.** The work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for “Snow and Ice Control (Truck)”, “Snow and Ice Control (Shadow Vehicle)”, and “Snow and Ice Control (Loader). This price shall be full compensation for personnel, equipment, labor, fuel, tools and incidentals.
Appendix D

Supplemental Documents

Florida Department of Transportation (FDOT)

Exhibits D.1 and D.2
**Exhibit D.1**

**FDOT: Sample AM Contract - Customized Scope of Services**

This customized scope was provided by Mr. David Sumner of FDOT Maintenance. The document lists all basic contracting information and guidelines for performance criteria. Specifications for Division 1 are also included in this document. All other specifications can be found online in the document list:

<http://www.dot.state.fl.us/statemaintenanceoffice/asset.shtm>

Reference:

Sumner, David. Personal interview. 19 July 2011

Used with permission by David Sumner.
SCOPE OF SERVICES
ASSET MAINTENANCE CONTRACT
(REV. 01-19-2010)

CONTRACT ADMINISTRATION

Contract Number: EXAMPLE
Financial Project Number (s): 12345

OBJECTIVE

This performance-based contract requires the inspection, management and performance of the maintenance of all components of the transportation facility as identified herein. All such maintenance activities the Department’s Maintenance Division formerly performed within the limits of this contract are now to be performed by the Contractor, unless otherwise exempted in this contract. Rather than the Department directing specific work as in most traditional maintenance contracts, this performance-based contract requires the Contractor to continually produce a quality product. The Department will continually evaluate the Contractor’s quality of work performed and if applicable rules and procedures were followed to achieve results. The Department is entrusting the Contractor to care for and maintain select roadways, structures, and facilities of Florida’s state roads and fully expects the Contractor to take pride in performing a high level of maintenance. The continual quality of the maintenance of the roadways, structures, and facilities will be a direct reflection, under public scrutiny, of the quality and integrity of the Contractor. The roadways, structures, and facilities included in the scope of this contract are as follows:

GENERAL REQUIREMENTS

1.1 Current Standards and Subsequent Updates

Perform all work to current Department Standards and Specifications throughout the contract duration, as may be updated throughout the life of the contract. Inspect, manage and maintain all assets within the project limits as identified in this scope, perform work that is consistent with the Department’s maintenance practices, and produce end results in accordance with Contract Documents in effect at the time of the performance of any work. Contract Documents include Florida Statutes, Florida Administrative Code, Design Standards, Maintenance Activity Standards, Rules, Procedures, Handbooks, Guides, Manuals, and applicable Department Specifications. Obtain the latest Department Specifications, including the Standard Specifications for Road and Bridge Construction, Workbook of Implemented Modifications to the Standard Specifications, and Mandatory Revisions to the Workbook, from the State Specifications Office Website on the Internet (http://www.dot.state.fl.us/specificationsoffice/). Obtain the latest Standard Maintenance Special Provisions from the Maintenance Office Website on the Internet http://www.dot.state.fl.us/statemaintenanceoffice/.

1.2 Contract Length
The initial Contract term is 5 years with a renewal option for one or more additional terms with the combined length of all renewal terms not to exceed the length of the original term of the contract. Renewals will be made at the sole discretion and option of the Department and must be agreed upon in writing by both parties. If the Department elects to renew, the Department will negotiate with the Contractor an adjustment factor to be applied to the original annual contract amount. The adjustment factor may be positive, negative, or zero. If negotiations do not lead to a mutually agreed upon adjustment factor, the contract shall not be renewed. The renewed contract amount will be calculated by applying the adjustment factor to the original contract amount, then adjusting for supplemental agreements as appropriate.

Renewal is contingent upon the availability of funds, satisfactory performance of the Contractor, and other factors as determined by the Department.

1.3 Invoicing and Compensation

This is a lump sum contract. Invoice the Department monthly according to the monthly amounts shown in payout schedule. Breakdown the monthly invoice by maintenance area for all work units completed for each Maintenance Management System (MMS) activity number.

1.4 Organizational Structure

Upon contract execution, provide a detailed organizational structure. Clearly define the responsibilities of each position identified in the organization structure. Provide qualifications of all personnel. Throughout the contract duration, submit all changes to organizational structure or position responsibility to the Department.

Decisions regularly require engineering judgment that may affect public health and safety. These decisions require the services of a Professional Engineer registered in the State of Florida. Identify at least one (1) individual licensed as a Professional Engineer in the State of Florida to perform these services. Identify a person in responsible charge of the contract who has the ability to instill public confidence and can responsibly act as a representative of the State of Florida Department of Transportation.

1.5 Performance Expectations and Evaluation

Inspect, manage and maintain the roadways, structures, and facilities as identified in the Scope uniformly and consistently throughout the contract period by meeting the performance specifications/measures established in this scope. The Department will evaluate Contractor performance in two ways: 1) by comparing actual work performance to the performance criteria established within this scope, and 2) by semiannually grading the Contractor according to the Performance Based Contracting Procedure. Unsatisfactory performance of work or failure to perform in accordance with the Contractor’s technical proposal or other contract documents will affect the Contractor’s semiannual grade and may further result in contract default.

1.6 Partnering

For this Contract, a non-bid pay item has been established for Partnering in the amount of $3,500. The objective of partnering is to establish a partnership charter and action plan between the Contractor, the Department and other parties associated with this Contract.
1.7 Contractor Responsibilities

Review and confirm for validity the data contained on the project CD, which is provided by the Department in conjunction with the Request for Proposal (RFP). Use the supplied project CD to assist in developing a complete understanding of all quantities and workloads pertaining to this scope of work.

Continually monitor all Department policies, procedures, specifications, and other Contract Documents for changes and updates. Be prepared to comply with any revisions.

Manage the maintenance of all assets identified in this scope. Tasks include work needs assessment; resource management; work activity planning and execution; and quality control performance to ensure work complies with contractual requirements. Develop an annual work plan to ensure the desired maintenance is performed.

Perform Routine and Periodic maintenance activities at a frequency that ensures uniform and consistent compliance with the Maintenance Rating Program (MRP) criteria, the required maintenance rating level, and any other established requirements of the Department. Research maintenance activity numbers, activity descriptions, and units of measure in the Department’s Maintenance Cost Handbook.

Take proper health and safety measures to ensure safety for the traveling public, Department employees, Contractor employees, and Subcontractor employees.

Manage and coordinate existing Department contracts within the limits of this contract until expiration of the Department contracts (Attachment I). Existing Department contracts will continue until money exhaustion or time expiration on the contract, whichever comes first. Document any instances of poor performance by the existing Department Contractor. If the Department prematurely terminates any existing contract, the Department will compensate the Asset Maintenance Contractor, in accordance with Performance Based Contracting Procedure, for assuming the unanticipated workload remaining on the terminated contract.

Comply with current lane closure restrictions, requirements, and individual lane closure analysis results. In some locations this may require nighttime work. Lane closure restrictions are subject to change due to updated traffic counts or various other events. Work with Department staff to coordinate lane closures during special events.

Develop and implement a Customer Service Resolution Plan. Maintain a customer service log detailing complaints and requests and the resolution of the items contained in the log. Include Customer name and contact information in the log.

Before performing any non-standard repairs or implementing any innovative ideas, submit the non-standard repair or innovative idea to the Department for approval.

Purchase (via monthly invoice deduction) all needed sign panels from the State Sign Shop in Lake City using the statewide process for requesting and receiving finished sign panels; or, as an alternative, obtain sign panels from a source of the Contractor’s choosing. Before installation, ensure sign panels meet minimum design requirements. Maintain a record of all Department provided sign panels.
Monitor and report to the Department all DBE utilization properly detailed as required in Specifications.

Manage the district Adopt-A-Highway as required by Chapter 403.4131 (3), *Florida Statutes*.

Consider participation in the Department’s Youth Work Experience Program, as provided by Chapter 334.351, *Florida Statutes*.

Provide any lists, summaries, logs, reports, or other documents to the Department for review as requested.

Pay all fines, fees, and penalties levied to the Department by any Governmental Agency resulting from negligent maintenance.

Pay all tolls required for usage of roads and bridges.

### 1.8 Department Responsibilities

The Department will provide all potential Contractors (bidders) with a project CD containing a variety of data and information about the roadways, structures, and facilities within the limits of this contract. Although the information on the CD is not complete, it will be useful in determining the extent of expected maintenance activities. The Department will place the following items on the project CD:

(a) Historical Contract Reports

(b) Historical MRP Reports

(c) Summary Spreadsheet for MRP Workloads

(d) RCI Converted Inventory

(e) Structure Information

(f) In-House-Crew Unit Cost Reports

Upon request, the Department will provide finished sign panels to the Contractor for sign maintenance and repair on the State Highway System within the project limits. The Department will verify that the Contractor has made a deduction from the Contractor’s monthly invoice for the cost of each sign panel obtained from the Lake City Sign Shop.

Annually, the Department will provide additional compensation to the Contractor via Supplemental Agreement or Unilateral Payment if the Contractor experiences a combined substantial economic impact during the previous year due to compliance with any of the following four (4) possible occurrences.

(a) A change to statewide maintenance programs or practices.
(b) A change to any of the policies, procedures, standards, manuals, handbooks, guides, specs, or any other State, Local, or Federal documents used to monitor the performance of this contract.

(c) Increased maintenance due to the construction of roadways, structures, and facilities that were not included in the Department’s Work Program at the time of the Contractor’s proposal due date or renewal date.

(d) Increased maintenance due to the transfer of ownership to the Department of non-state roadways, structures, and facilities within the contract limits.

A substantial economic impact is defined as documented financial burden on the Contractor exceeding five percent (5%) of the annual contract amount. If additional compensation is warranted, the Department will compensate only for the value of economic impact beyond the five percent (5%) threshold. The five percent (5%) is not cumulative year to year; it is reset each anniversary of contract start date. The Contractor will not receive any additional compensation for maintenance of projects scheduled in the Department’s Work Program at the time of the proposal due date or renewal dates.

Similarly, the Department will reduce payment to the Contractor if the Contractor experiences a combined substantial economic savings during the previous year due to occurrence of any of the following four (4) possibilities:

(a) A change to statewide maintenance programs or practices.

(b) A change to any of the policies, procedures, standards, manuals, handbooks, guides, specs, or any other State, Local, or Federal documents used to monitor the performance of this contract.

(c) Reduced maintenance due to the elimination or planned destruction of roadways, structures, and facilities.

(d) Reduced maintenance due to the transfer of ownership of Department-owned roadways, structures, and facilities to other non-Department entities.

A substantial economic savings is defined as a cost savings exceeding five percent (5%) of the annual contract amount. If cost savings are identified, payment to the Contractor will be reduced only for savings greater than the five percent (5%) threshold. The five percent (5%) is not cumulative year to year; it is reset each anniversary of contract start date.

2. EMERGENCY MANAGEMENT

2.1 General

The Department categorizes Emergency Management into two classifications: “Governor Declared Emergencies” and “Other Emergencies”. For Governor Declared Emergencies, perform pre-event preparation and provide initial response post-event to protect the traveling public from grievous hazards created by the event. For Other Emergencies, perform all aspects of responding to the incident/event, including pre-event preparation, post-event initial response, and post-event cleanup and repair. For both classifications of Emergency Management, perform
the following six (6) activities before every foreseeable Emergency Management incident/event:

(a) Contact vendors and subcontractors to verify quantity, availability, and priority of appropriate equipment and personnel (e.g. MOT devices, variable message boards, chainsaws, sand spreaders, etc.). Develop a complete up-to-date list of equipment resources and staging locations and of all stockpiled materials and their locations.

(b) In case of possible area evacuations, prepare for implementation of one-way evacuation plans including the pre-staging of necessary one-way evacuation resources.

(c) If directed by the Department implement one-way evacuation and remove one-way evacuation devices when complete.

(d) Secure and lockdown all structures covered under this contract.

(e) In preparation for high winds, rains, and other impending elements, secure all existing worksites associated with this contract.

(f) Lower all high mast lights within the projected path of a hurricane where wind speeds are projected to be category two or higher at location of high mast lights, or as otherwise directed by the Department. Lower lights to within ten (10) feet of the ground. If the lowered position of lights places them at risk of adjacent tree damage, place lights as low as possible while avoiding tree damage risk. Do not lower high mast lights on routes that are expected to be used for one-way evacuation.

If high mast lighting has been lowered, repaired, or raised due to preparation/reaction to storm events, submit a separate informational invoice detailing the cost of such lowering, repairing, and raising of the high mast lights. Show the high mast lighting costs by maintenance area, by Financial Project Number, and by activity (lower, repair, raise). Retain all documentation required for the Department to apply for Federal Reimbursement for this activity.

For any one-way evacuation activities performed to prepare/react to storm events, submit a separate informational invoice detailing the cost of such one-way evacuation activities. Show the one-way evacuation costs by maintenance area, by Financial Project Number, and by activity. Retain all documentation required for the Department to apply for Federal Reimbursement for one-way evacuation activities.

For any activities associated with securing bascule bridges in preparation/reaction to storm events, submit a separate informational invoice detailing the cost of such activities. Show the costs to secure bascule bridges by maintenance area, by Financial Project Number, and by activity. Retain all documentation required for the Department to apply for Federal Reimbursement for these activities.

Unless otherwise noted in this contract, the Department will not provide additional compensation to the Contractor through this contract for any Emergency Management activities, including the six activities described above.

For all Emergency Management activities, the Department reserves the right to take control of the incident and/or perform recovery work with its own or other contracted forces when the Department determines it is in the Department’s best interest to do so.
2.2 Emergency Management Plan

Know the applicable District Comprehensive Emergency Management Plan as well as the FHWA and FEMA guidelines for federal reimbursement. Ensure compliance with all State and Federal Emergency Management Requirements. Administer all response and recovery efforts in accordance with these documents. Develop an Emergency Management Plan that sufficiently replicates the intent of the District’s Comprehensive Emergency Management Plan and incorporate this plan with the Technical Proposal. Include details in the Emergency Management Plan including, but not limited to:

- procedures for incident/event management
- agency & public notifications
- assurance of motorist safety
- handling of hazardous waste
- coordination with Law Enforcement and other appropriate agencies
- traffic control
- coordination with the Department and other agencies to establish or implement pre-established detour routes
- maintenance of detour routes
- making emergency repairs
- debris removal
- evacuation/ one-way evacuation response
- submission of incident/event reports
- plan for compliance with the Open Roads Policy
- detailed organizational structure with the functions, qualifications, experience level, and contact information of staff assigned to respond to incidents/events

Comply with all Department plans and with all Local, State, and Federal laws and regulations concerning evacuation routes and the handling and disposal of hazardous waste. Update the Emergency Management Plan in April of each year by engaging in an iterative process of discussion between the Department and the Contractor whereby lessons learned from past experience can be implemented for future use. Prior to the occurrence of any incidents/events, ensure an approved Emergency Management Plan is in effect and be prepared to act upon that plan.
2.3 Specific Contractor Responsibilities for Governor Declared Emergencies

Governor Declared Emergencies are incidents/events that prompt the Governor of Florida to declare a State of Emergency in response to the incident/event. Governor Declared Emergencies will most commonly be major hurricanes and other natural disasters, but can include smaller natural disasters/events/storms (Acts of God), collisions with structures and related components, and incidents/events resulting from human interactions.

If directed by the Department in writing, perform the following three (3) Pre-Event activities and separately track and invoice the Department for associated costs. The Department will compensate the Contractor for their direct costs of performing these three (3) Pre-Event activities as described in the Department’s written directions to the Contractor:

(a) Supplement Road Ranger Service Patrols and provide fuel assistance to stranded motorists.

(b) Provide additional security at Rest Areas and Welcome Center facilities.

(c) Provide additional portable rest room facilities at Rest Areas, Weigh Stations, Welcome Centers, and other locations as directed by the Department.

Perform the following six (6) Post-Event activities. The Department will not provide additional compensation to the Contractor for the performance of these six (6) Post-Event activities:

(d) Search all roadways covered by this contract for grievous hazards (roadway washouts/cave-ins, downed electrical lines, non-traversable bridges, etc.). This may include clearing some debris from the roadway in order to access these hazardous areas. Minimal clearing required to access hazardous areas will not be considered first-push roadway clearing.

(e) Immediately respond to perform traffic control, set up safety devices, and layout established or improvised detour routes in order to protect the traveling public from grievous hazards created by the incident/event. When detour routes are required due to an incident/event occurring on a roadway and/or structure covered by this contract, manage and maintain the entire detour route within the State of Florida, even if the route extends onto roadways and/or structures not covered by this contract (state or non-state). For portions of a detour route extending outside Florida, coordinate detour setup and maintenance with the appropriate State.

(f) Notify the Department’s designated contact person immediately upon occurrence of all major incidents/events and immediately upon road closure for all roadway and/or structure closures exceeding one (1) hour. Notify the Department again upon roadway and/or structure reopening.

(g) Inspect, perform any minor repairs, and raise all high mast lighting back to their original position as directed by the Department. “Minor repairs” is defined as repairs not eligible for Federal reimbursement.

(h) Inspect, unlock, and perform any minor repairs to all bascule bridges. “Minor repairs” is defined as repairs not eligible for Federal reimbursement.
(i) Assist the Department in performing damage assessment reviews as per *Bridge, Overhead Sign Structures and High Mast Light Poles Damage Assessment Review Guidelines*.

(j) Do not perform first-push activities, debris removal, cleanup, or federally reimbursable repair work necessitated by a Governor Declared Emergency incident/event.

2.4 Specific Contractor Responsibilities for Other Emergencies

Other Emergencies are incidents/events that do not prompt the Governor of Florida to declare a State of Emergency in response to the incident/event. Other Emergencies will most commonly be traffic crashes, guardrail hits, severe potholes, debris within travel lanes, attenuator hits, roadway shoulder wash-outs, roadway cave-ins, and downed light poles but can include natural disasters/events/storms (Acts of God), collisions with structures and related components, and incidents/events resulting from human interactions.

Respond and deploy resources according to the goals established in the *Open Roads Policy*. Arrive on-site, prepared to take necessary action with necessary manpower and emergency response equipment. Working hours referenced under the Department responsibilities in the *Open Roads Policy* are defined as Monday through Friday 7:00 am to 5:30 pm. Be available to relieve Law Enforcement personnel of traffic control functions within fifteen (15) minutes of arriving onsite.

Manage all aspects of traffic control related to an incident/event, including coordination with Governmental agencies when incidents/events spill over onto roadways and/or structures not covered by this contract. When detour routes are required due to an incident/event occurring on a roadway and/or structure covered by this contract, manage and maintain the entire detour route, even if the route extends onto roadways and/or structures not covered by this contract (state or non-state). Notify the Department’s designated contact person immediately upon occurrence of all major incidents/events and immediately upon road closure for all roadway and/or structure closures exceeding one (1) hour. Notify the Department again upon roadway and/or structure reopening.

2.5 Recovery of Costs, Reimbursement and Coverage for Other Emergencies

When an incident/event causes damage to any Department facilities, structures or property (hereinafter collectively referred to as Property), which is subject to the terms of this Agreement, the Department authorizes the Contractor to pursue recovery against any responsible party for reimbursement of costs incurred by the Contractor in accordance with this agreement (hereinafter Costs). Certain Property (assets) of the Department is insured by the Insurance Company under the State of Florida, Department of Transportation’s Bridge, Property and Business Interruption Insurance Program (Insurance Program). The following procedures and terms shall apply to the recovery of Costs incurred by the Contractor, Reimbursement by the Department and Coverage by the Insurance Company (as defined herein).

Upon learning that damage has been caused to Department Property covered by this agreement the Contractor will immediately notify the Department Project Manager and Department Claims Attorney (Office of the General Counsel) who will confirm whether the Property is an insured asset. The Department shall notify the Insurance Company.

A. The damaged asset is not insured under the Insurance Program (or the FDOT does
not make a claim on the insurance coverage) and Costs are equal to or less than $1,000,000.

1. The Contractor is authorized to pursue recovery against any and all parties responsible for Costs caused by damage to the Property to the extent permitted by law. The Department will assist the Contractor as necessary and will confirm the Contractor’s authorization to pursue recovery. The Contractor will be responsible for all attorneys’ fees and litigation costs incurred in its recovery activities.

B. The damaged asset is not insured under the Insurance Program (or the FDOT does not make a claim on the insurance coverage) and Costs are in excess of $1,000,000.

1. In this situation the Department may be responsible to reimburse the Contractor for any Costs incurred in excess of $1,000,000. Under these circumstances the Department retains its rights to pursue recovery against any and all parties for the amount of any reimbursement made to the Contractor in excess of $1,000,000 (hereinafter Reimbursement). The Department and Contractor agree to coordinate their pursuit of recovery of their respective Costs and Reimbursement from the responsible parties, and not to execute any documents or take any actions which would impair or limit the other’s right to recovery. The Department and Contractor may enter into an agreement for sharing attorney’s fees and litigation costs. The Department and Contractor agree to share any recovery on a pro-rata basis based upon their respective Costs and Reimbursement, in accordance with Florida law, unless otherwise agreed to in a separate writing.

C. The damaged asset is insured under the Insurance Program (and FDOT makes a claim for insurance coverage) and Costs are equal to or less than $1,000,000.

1. In this situation the Insurance Company retains a subrogated interest in the recovery against any and all responsible parties to the extent of its payment for coverage under the appropriate policy (Coverage). The Coverage may include damages other than the Costs incurred by the Contractor. The Contractor is authorized to pursue recovery against any and all parties responsible for Costs caused by damage to the Property to the extent permitted by law. The Department will assist the Contractor as necessary and will confirm the Contractor’s authorization to pursue recovery. The Department and Contractor agree to coordinate their pursuit of recovery of their respective Costs and Reimbursement with the Insurance Company and its claim for Coverage from the responsible parties, and not to execute any documents or take any action which would impair or limit the others’ right to recovery. The Department, Contractor and Insurance Company may enter into an agreement for sharing attorney’s fees and litigation costs, otherwise each will bear its own fees and costs. The Department, Contractor and Insurance Company agree to share any recovery on a pro-rata basis based upon their respective Costs, Reimbursement and Coverage in accordance with Florida law, unless otherwise agreed to in a separate writing.

D. The damaged asset is insured under the Insurance Program (and FDOT makes a claim for insurance coverage) and Costs are in excess of $1,000,000.

1. In this situation the Department may be responsible to reimburse the Contractor for any Costs incurred in excess of $1,000,000. Under these circumstances the Department retains its rights to pursue recovery against any and all parties for the amount of any reimbursement made to the Contractor in excess of $1,000,000 (hereinafter Reimbursement) and the insurance company retains a subrogated interest in the recovery against any and all
responsible parties to the extent of its payment for coverage under the appropriate policy (Coverage). The Coverage may include damages other than the Costs incurred by the Contractor. The Contractor is authorized to pursue recovery against any and all parties responsible for Costs caused by damage to the Property to the extent permitted by law. The Department will assist the Contractor as necessary and will confirm the Contractor’s authorization to pursue recovery. The Department and Contractor agree to coordinate their pursuit of recovery of their respective Costs and Reimbursement with the Insurance Company and its claim for Coverage from the responsible parties, and not to execute any documents or take any actions which would impair or limit the others’ right to recovery in accordance with Florida law. The Department, Contractor and Insurance Company may enter into an agreement for sharing attorney’s fees and litigation costs, otherwise each will bear its own fees and costs. The Department, Contractor and Insurance Company agree to share any recovery on a pro-rata basis based upon their respective Costs, Reimbursement and Coverage in accordance with Florida law, unless otherwise agreed to in a separate writing.

In paragraphs 5C and 5D above, the Contractor shall submit all proposed settlement documentation (settlement agreement, release and order of dismissal) for review and approval by the Office of the General Counsel prior to execution. Approval by the Department shall not be unreasonably withheld.

E. Failure to coordinate and cooperate in pursuing recovery, or impairment or limitation of a party’s right to recovery.

1. With regard to paragraphs 5A, B, C and D, above, if either the Department or Contractor fails to coordinate and cooperate in the pursuit of any recovery under these provisions or impairs or limits the lawful recovery of the other or the Insurance Company, it will be liable to the other and the Insurance Company for reasonable attorneys’ fees and costs incurred in compelling coordination and cooperation or correcting any impairment or limitation to its lawful recovery. The Contractor shall not be entitled to any Coverage which may be available to the Department from the Insurance Company.

Although the Contractor is responsible for repairing damage resulting from an act that is officially declared by the State of Florida as an “act of terrorism”, the Department will compensate the Contractor via Supplemental Agreement or Unilateral Payment for “act of terrorism” damage repair costs.

2.6 Financial Relief for Severe Incidents

For any single incident, the Department will reimburse the Contractor for any damage repair construction costs in excess of $1,000,000.

Such financial relief for severe single incidents does not apply if the incident was caused, created, or magnified by the Contractor’s negligence.

3. CONTRACT DOCUMENTS

Obtain the complete, up-to-date list of Contract Documents (Specifications, Procedures, Manual, Guides and Handbooks) incorporated as a part of this contract from the Maintenance Office Website on the Internet
ASSET MAINTENANCE PERFORMANCE MEASURES

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Deduction/Retainage</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to meet overall MRP score requirements (Periods 1 &amp; 2)</td>
<td><strong>Retain</strong> one half percent (.5%) of one-third of the annual contract amount for each MRP point below procedural requirements for overall MRP score</td>
</tr>
<tr>
<td>b. Substandard MRP for individual elements (Periods 1 &amp; 2)</td>
<td><strong>Retain</strong> one quarter percent (.25%) of one-third of the annual contract amount for each MRP point below procedural requirements for each element rating</td>
</tr>
<tr>
<td>c. Substandard MRP for individual characteristics (Periods 1 &amp; 2)</td>
<td><strong>Retain</strong> one eighth percent (.125%) of one-third of the annual contract amount for each MRP point below procedural requirements for each characteristic rating</td>
</tr>
<tr>
<td>d. Failure to meet overall MRP score requirements (Final Annual Rating)</td>
<td><strong>Deduct</strong> one half percent (.5%) of the annual contract amount for each MRP point below procedural requirements for overall MRP score</td>
</tr>
<tr>
<td>e. Substandard MRP for individual elements (Final Annual Rating)</td>
<td><strong>Deduct</strong> one quarter percent (.25%) of the annual contract amount for each MRP point below procedural requirements for each element rating</td>
</tr>
<tr>
<td>f. Substandard MRP for individual characteristics (Final Annual Rating)</td>
<td><strong>Deduct</strong> one eighth percent (.125%) of the annual contract amount for each MRP point below procedural requirements for each characteristic rating</td>
</tr>
</tbody>
</table>

PERFORMANCE CRITERIA NOTES:

For **ALL** performance measures identified in all charts found in this scope, the “Time Allowed/Criteria” is **PER APPLICABLE PROCEDURE**. If the applicable procedure is non-specific for time allowed or criteria, then use the “Time Allowed/Criteria” given in the applicable chart.

For all times allowed in all charts found in this scope, the District Maintenance Engineer/Administrator may grant a time extension for unusual circumstances if the extension is requested during the original time period allowed.

All deductions withheld from the Contractor will occur through adjustments to the next appropriate monthly invoice amount.

GUARDRAIL

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to perform timely</td>
<td>Per Procedure, Manuals,</td>
<td>$500 per day per delinquent</td>
</tr>
<tr>
<td>Inspection Deficiency</td>
<td>Time Allowed/Criteria</td>
<td>Deduction</td>
</tr>
<tr>
<td>------------------------</td>
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<tr>
<td><strong>b. Failure to timely submit Inspection Sheets/Reports</strong></td>
<td>Due within 15 days after completion of inspection</td>
<td>$100 per day per delinquent report</td>
</tr>
<tr>
<td><strong>c. Failure to make repairs identified in Inspection Reports</strong></td>
<td>Within 30 days of identification</td>
<td>$500 per day per guardrail</td>
</tr>
<tr>
<td><strong>d. Failure to make temporary safety repairs resulting from incidents</strong></td>
<td>Must secure with proper Maintenance of Traffic (MOT) before leaving the site</td>
<td>$1,000 per day per guardrail</td>
</tr>
<tr>
<td><strong>e. Failure to make permanent repairs resulting from incidents</strong></td>
<td>Repair within 10 calendar days of Incident</td>
<td>$1,000 per day per guardrail</td>
</tr>
</tbody>
</table>

**ATTENUATORS**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Failure to perform timely inspections</strong></td>
<td>Per Procedure, Manuals, Codes, etc.</td>
<td>$500 per day per delinquent inspection</td>
</tr>
<tr>
<td><strong>b. Failure to timely submit Inspection Sheets/Reports</strong></td>
<td>Per Procedure, Manuals, Codes, etc.</td>
<td>$100 per day per delinquent report</td>
</tr>
<tr>
<td><strong>c. Failure to make repairs identified in Inspection Reports</strong></td>
<td>Within 30 days of identification</td>
<td>$500 per day per attenuator</td>
</tr>
<tr>
<td><strong>d. Failure to make temporary safety repairs resulting from incidents</strong></td>
<td>Must secure with proper MOT before leaving the site</td>
<td>$1,000 per day per attenuator</td>
</tr>
<tr>
<td><strong>e. Failure to make permanent repairs resulting from incidents</strong></td>
<td>Repair within 5 calendar days of Incident</td>
<td>$1,000 per day per attenuator</td>
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</tbody>
</table>

**SIGNS**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a. Failure to perform timely Inspections</strong></td>
<td>Per Procedure, Manuals, Codes, etc.</td>
<td>$500 per day per delinquent inspection</td>
</tr>
<tr>
<td><strong>b. Failure to timely submit Inspection Sheets/Reports</strong></td>
<td>Due within 15 days after completion of inspection</td>
<td>$100 per day per delinquent report</td>
</tr>
<tr>
<td><strong>c. Failure to make repairs identified in Inspection Reports</strong></td>
<td>Per Procedure, Manuals, Codes, etc.</td>
<td>$500 per day per sign assembly</td>
</tr>
<tr>
<td><strong>d. Failure to replace missing signs and signs downed by incidents</strong></td>
<td>Per Procedure, Manuals, Codes, etc.</td>
<td>Permanent regulatory and warning signs $2,000 per day per sign assembly. Temporary signs $100 per day per sign assembly. Permanent signs $500 per day per sign assembly</td>
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**CLEAR ZONE OBSTRUCTIONS**
<table>
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<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
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</thead>
<tbody>
<tr>
<td>a. Failure to temporarily secure reported or discovered clear zone obstructions</td>
<td>Must respond within 1 hour &amp; secure with proper MOT before leaving the site</td>
<td>Response - $100 per hour per location, Secure - $1,000 per day per location</td>
</tr>
<tr>
<td>b. Failure to remove or correct clear zone obstructions</td>
<td>Within 7 days</td>
<td>$1,000 per day per location</td>
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</tbody>
</table>

**BARRIER WALL**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to replace or repair damaged barrier wall</td>
<td>Secure with proper MOT before leaving the site. Permanent Repairs within 7 days of notification.</td>
<td>Secure MOT $1,000 per day per location, Permanent repairs $1,000 per day per location</td>
</tr>
</tbody>
</table>

**CUSTOMER SERVICE RESOLUTION**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to contact customer</td>
<td>Contact customer within 24 hours</td>
<td>$500 per day per customer</td>
</tr>
<tr>
<td>b. Failure to resolve customer service request to the satisfaction of the Department</td>
<td>Resolve within 2 weeks of customer contact</td>
<td>$500 per day per customer request</td>
</tr>
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**EMERGENCY RESPONSE**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>a. Failure to properly respond to incidents/events as required in Emergency Management section of this scope or according to the goals established in the Open Road Policy.</td>
<td>Per Emergency Management section requirements established in this scope and in the Open Road Policy.</td>
<td>$1,000 per hour, prorated, per incident/event</td>
</tr>
</tbody>
</table>

**EMERGENCY DEBRIS REMOVAL (INCLUDING DEAD ANIMALS)**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to promptly and properly remove and dispose of emergency debris</td>
<td>Per Emergency Response for Debris Removal Specifications (SMSP)</td>
<td>$500 per day per incident</td>
</tr>
</tbody>
</table>

**GRAFFITI**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to promptly remove or cover graffiti</td>
<td>Remove or cover graffiti within 36 hours of discovery</td>
<td>$1,000 per day per roadway mile</td>
</tr>
</tbody>
</table>

**SUBMISSION OF DEPARTMENT REQUESTED DOCUMENTS**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Upon Department request, failure to submit any documents the Contractor is required to maintain</td>
<td>Submit document by the end of the business day following the day of the Department’s request</td>
<td>$100 prorated per business day per requested document</td>
</tr>
</tbody>
</table>

**DEPARTMENT POLICIES AND PROCEDURES**
<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Violation of any Department procedures, policies, handbooks, or any other contract document</td>
<td>$500 per occurrence of violation</td>
</tr>
</tbody>
</table>

**CONTRACTOR’S TECHNICAL PROPOSAL**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Deviating from any claims, promises, statements, guarantees, or other assurances made within the Contractor’s original Technical Proposal</td>
<td>$500 per occurrence of violation</td>
</tr>
</tbody>
</table>

Contract includes Interchanges, crossroads and ramps to the point at which the right-of-way terminates or as shown by the Department through supplemental description. Includes utility locates.

Contract includes overpasses and approach roadways over the transportation facilities within limits of right-of-way.

Contract includes waterways, canals, ditches, outfalls, and intermittent waterway canals to the right-of-way line including compliance with any permit requirements.

Contract includes stormwater management and mitigation areas associated with the highway corridor including compliance with all permit requirements.

**MAINTENANCE RATING PROGRAM PERFORMED BY THE DEPARTMENT**

Achieve and maintain a Maintenance Rating Program (MRP) rating as required in Department procedures for all elements and characteristics. Use the criteria established in Department procedures to constantly evaluate the level of maintenance attained to ensure a uniform and consistent level of maintenance at all times.

The Department will perform a complete MRP rating three (3) times per year using the criteria outlined in the MRP Handbook. The Department will randomly generate locations to be rated each period. The Department will calculate the MRP scores for the Contractor. The Department may perform interim MRP ratings for specific characteristics as quality control checks of the Contractor and to ensure that the Contractor is consistently maintaining the state highway system. The Department will use the randomly generated points when performing interim MRP checks. The Department will consider these interim rating scores when the Department determines the Contractor’s semiannual grades, as per Performance Based Contracting Procedure.

At least five (5) working days in advance of scheduled MRP evaluation, the Department will invite the Contractor to accompany the Department MRP team in their review. The Contractor may accompany the Department’s MRP team with a maximum of two trained MRP team members. If the Contractor does not attend the MRP evaluation, they cannot contest the MRP scores. Upon encountering any disagreement associated with an MRP evaluation, attempt to resolve the dispute in the field with the Department MRP team. If no resolution can be reached in the field, both parties will document the dispute and elevate the issue to the Department’s Contract Administrator. Failure to reach resolution of the dispute at this level will result in further escalation through the District Maintenance Administrator/Engineer and finally up to the Director of the Office of Maintenance whose decision is final. Beginning from the time the
dispute is elevated to the Contract Administrator, the Department is allowed a total of ten (10) business days to resolve the dispute. If the ten (10) business days elapse before the dispute is resolved or if the dispute is resolved in favor of the Contractor, the disputed MRP characteristic will be changed to reflect the Contractor’s evaluation for the disputed MRP sample point. After all disputes are resolved, the Department will recalculate official MRP scores accordingly.

**HIGHWAY LIGHTING**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Unsatisfactory</td>
<td>Per Procedures, Manuals, Codes, and Per Performance Lighting Specifications (Standard Maintenance Special Provisions)</td>
<td>$5,000 per survey identifying excessive outage</td>
</tr>
<tr>
<td>Department lighting outage survey</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b. Failure to make temporary safety repairs resulting from Incidents</td>
<td>Must secure public safety from hazards and establish proper MOT before leaving the site</td>
<td>$1,000 per day per light pole</td>
</tr>
<tr>
<td>c. Failure to replace light poles damaged by Incidents</td>
<td>Per Performance Lighting Specifications (Standard Maintenance Special Provisions)</td>
<td>$500 per day per light pole</td>
</tr>
</tbody>
</table>

**PERMITS COORDINATION, PROCESSING, ADMINISTRATION, & INSPECTION**

Perform all permitting activities within or associated with Department Right of Way. Meet all the requirements in *Florida Administrative Code (F.A.C.)*.

Coordinate, process, administer, and inspect all permits on the roadways covered by this contract. Enter all permit related data into the Permits Information Tracking System. Collect all permit fees and turn them over to the Department's representative. The Department will retain all approvals and signatures as required by the F.A.C. Process all permits expeditiously as required by *Florida Statutes* and F.A.C. Process "General Use" Permits in accordance with District requirements. Process all permits to completion, which is either approval or denial. The scope of this contract does not include permitting of outdoor advertising billboards or permitting of overweight/overdimension vehicles.

In the Technical Proposal, include a Permit Processing Plan which details the permitting process, adherence to permitting requirements, and processes to ensure customer satisfaction.

**Permits Performance Criteria**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to timely processed permits via permits Information Tracking System</td>
<td>Per <em>Florida Statutes, F.A.C.</em>, procedures, permit requirements, etc.</td>
<td>$500 per day per permit</td>
</tr>
<tr>
<td>b. Failure to inspect permitted activity as required</td>
<td>Per <em>Florida Statutes, F.A.C.</em>, procedures, permit requirements, etc.</td>
<td>$500 per day per permit</td>
</tr>
</tbody>
</table>
### CALL BOXES

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to perform timely inspections and testing</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$100 per day per delinquent inspection</td>
</tr>
<tr>
<td>b. Failure to timely repair deficiencies identified by inspection, testing, or highway patrol</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$500 per day per call box</td>
</tr>
<tr>
<td>c. Failure to replace non-repairable call boxes identified by inspection, testing, or highway patrol</td>
<td>Within 3 days of identification</td>
<td>$500 per day per call box</td>
</tr>
<tr>
<td>d. Failure to repair non-critical deficiencies identified by inspection, testing, or highway patrol</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$100 per day per call box</td>
</tr>
<tr>
<td>e. Failure to replace call boxes damaged by Incidents</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$500 per day per call box</td>
</tr>
</tbody>
</table>

### ROADWAY CHARACTERISTICS INVENTORY (RCI)

Update the Maintenance Roadway Characteristics Inventory (RCI) when changes occur to any roadway characteristic within the project limits. Verify and update each RCI characteristic periodically as directed by the Maintenance Roadway Characteristics Inventory Manual. Maintain updated coding sheets in Contractor files.

#### RCI Performance Criteria

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to timely and accurately update RCI</td>
<td>Per RCI Manual, Procedures, etc.</td>
<td>$100 per day per delinquent or incorrect RCI data entry</td>
</tr>
</tbody>
</table>

### REST AREAS, WELCOME CENTERS, and WAYSIDE PARKS

Manage, operate, and perform maintenance on all Rest Areas, Welcome Centers, and Wayside Parks within the contract limits in accordance with the requirements in the *Standard Scope of Services for Rest Area Maintenance (RA Scope)* found on the Office of Maintenance website. Maintain all components of the Rest Area and Welcome Center facilities including but not limited to buildings, roadways, parking lots, grounds, picnic areas, potable water facilities, stormwater management facilities, wastewater treatment facilities, and emergency generators. All items listed in the *RA Scope* as “Department Responsibility” will be the Contractor’s responsibility, up to but not including one hundred percent (100%) refurbishing or replacement of the entire facility. Keep all Rest Area and Welcome Center permits up-to-date, operate and maintain all facilities in accordance with those permits, and manage all environmental issues involving the Rest Areas and Welcome Centers. Perform frequent Rest Area and Welcome Center inspections as required in the *RA Scope* and record the inspection results using the *Quality Assessment Review - Rest Area Inspection Checklist (RA Checklist)* form. Calculate
Rest Area and Welcome Center scores from RA Checklists and maintain copies of checklists and scores in Contractor files. Achieve and maintain at least the minimum Rest Area and Welcome Center scores required by Department Procedure.

For each Rest Area and Welcome Center inspection, invite the Department to perform a simultaneous independent inspection also utilizing the RA Checklist. Depending on historical Contactor performance, the Department may or may not accept the invitation. Discuss inspection score results with the Department in order to identify and rectify any differences in inspection techniques and opinions. When simultaneous inspections are performed, the Department’s inspection score will become the official score upon which performance deductions are based. When the Department elects not to perform a simultaneous inspection, the Contractor’s inspection score will become the official score upon which performance deductions are based. For each monthly invoice, reduce the monthly lump sum amount by the total of all Rest Area and Welcome Center performance deductions.

The scope of this contract does not include management or maintenance of Information Centers within the Rest Areas and Welcome Centers. Refer to Office of Maintenance website for a comprehensive list of all Rest Areas and Welcome Centers.

### Rest Area/Welcome Center Performance Criteria

<table>
<thead>
<tr>
<th>REST AREAS &amp; WELCOME CENTERS</th>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Facility rating falls below minimum allowed</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$1,000 per point below minimum per facility</td>
<td></td>
</tr>
<tr>
<td>b. Facility closure due to Contractor negligence</td>
<td>Facility closure</td>
<td>$1,000 per hour per facility</td>
<td></td>
</tr>
</tbody>
</table>

### REST AREA SECURITY

The Contractor will provide Security Guard Services in accordance with the requirements in Standard Scope of Services for Security Guard Services (Security Scope). In addition, the Contractor will be assessed reductions, as defined in the Security Scope. The scope of this contract does not include providing Security Guard Services at Weigh Stations.

#### Security Guard Service Performance Measures

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Not properly equipped</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>b. No cellular phone or inoperative phone</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>c. Inoperative vehicle or no vehicle</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>d. No revolver or ammunition</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>e. Inadequate literacy (unable to communicate verbally or in writing)</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>f. Invalid drivers license</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>g. Inadequate health interfering with performance of duty</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>h. Lack of post/location coverage</td>
<td>Per Rest Area Security</td>
<td>$250.00 day per</td>
</tr>
</tbody>
</table>
### WELCOME CENTER SECURITY

The Contractor will provide Security Guard Services in accordance with the requirements in *Standard Scope of Services for Security Guard Services (Security Scope)*. In addition, the Contractor will be assessed reductions, as defined in the *Security Scope*. The scope of this contract does not include providing Security Guard Services at Weigh Stations.

#### Security Guard Service Performance Measures

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Not properly equipped</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>b. No cellular phone or inoperative phone</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>c. Inoperative vehicle or no vehicle</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>d. No revolver or ammunition</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>e. Inadequate literacy (unable to read)</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>i. Lack of contract supervision</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>j. Excessive hours on duty (not approved in advance by the Department)</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>k. Reassignment of a security officer previously suspended from duty by the Department</td>
<td>Per Rest Area Security</td>
<td>$200.00 day per incident</td>
</tr>
<tr>
<td>l. Ineligible person not meeting the contract criteria (not including drivers license)</td>
<td>Per Rest Area Security</td>
<td>$500.00 day per incident</td>
</tr>
<tr>
<td>m. Late for duty</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>n. Inappropriate behavior (reading, lounging, inattention, etc.)</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>o. Sleeping on duty</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>p. Failing to make a report</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>q. Improper rounds</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>r. Failing to follow post orders</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>s. Abandoning post</td>
<td>Per Rest Area Security</td>
<td>$250.00 day per incident</td>
</tr>
<tr>
<td>t. Improper or badly soiled uniform</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>u. Not having proper documentation on file or on them not showing compliance with Section 14-B and 14-C (this fine is per person)</td>
<td>Per Rest Area Security</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>v. Missing Rest Area security sign</td>
<td>Per Rest Area Security</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>Deficiency Identification</td>
<td>Time Allowed/Criteria</td>
<td>Deduction</td>
</tr>
<tr>
<td>--------------------------</td>
<td>-----------------------</td>
<td>-----------</td>
</tr>
<tr>
<td>a. Truck not properly equipped or maintained</td>
<td>Per Road Ranger Scope of Service</td>
<td>$50.00 per occurrence/per day</td>
</tr>
<tr>
<td>b. Truck not properly equipped or maintained</td>
<td>Per Road Ranger Scope of Service</td>
<td>$100.00 per incident</td>
</tr>
<tr>
<td>c. Truck not properly equipped or maintained</td>
<td>Per Road Ranger Scope of Service</td>
<td>$250.00 per incident</td>
</tr>
<tr>
<td>d. Truck not properly equipped or maintained</td>
<td>Per Road Ranger Scope of Service</td>
<td>$50.00 per day per incident</td>
</tr>
<tr>
<td>e. Truck not properly equipped or maintained</td>
<td>Per Road Ranger Scope of Service</td>
<td>$250.00 per day per incident</td>
</tr>
<tr>
<td>f. Invalid drivers license</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>g. Inadequate health interfering with performance of duty</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>h. Lack of post/location coverage</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$250.00 day per incident</td>
</tr>
<tr>
<td>i. Lack of contract supervision</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>j. Excessive hours on duty (not approved in advance by the Department)</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>k. Reassignment of a security officer previously suspended from duty by the Department</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$200.00 day per incident</td>
</tr>
<tr>
<td>l. Ineligible person not meeting the contract criteria (not including drivers license)</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$500.00 day per incident</td>
</tr>
<tr>
<td>m. Late for duty</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>n. Inappropriate behavior (reading, lounging, inattention, etc.)</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>o. Sleeping on duty</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>p. Failing to make a report</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>q. Improper rounds</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>r. Failing to follow post orders</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>s. Abandoning post</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$250.00 day per incident</td>
</tr>
<tr>
<td>t. Improper or badly soiled uniform</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
<tr>
<td>u. Not having proper documentation on file or on them not showing compliance with Section 14-B and 14-C (this fine is per person)</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$100.00 day per incident</td>
</tr>
<tr>
<td>v. Missing Rest Area security sign</td>
<td>Per Rest Area Security Scope of Service</td>
<td>$50.00 day per incident</td>
</tr>
</tbody>
</table>
b. No cellular telephone or inoperative telephone  
   Per Road Ranger Scope of Service  
   $100.00 per occurrence/per day

c. No alpha/numeric pagers  
   Per Road Ranger Scope of Service  
   $100.00 per occurrence/per day

d. Sleeping on duty  
   Per Procedure 250-012-011 & Florida Administrative Code  
   $100.00 per occurrence/per day

e. Incomplete motorist aid service log  
   Per Road Ranger Scope of Service  
   $50.00 per occurrence/per day

f. Improper uniforms  
   Per Road Ranger Scope of Service  
   $50.00 per occurrence/per day

g. Non-compliance of Department conduct standards  
   Per Procedure 250-012-011 & Florida Administrative Code  
   $50.00 per occurrence/per day

h. Use of the vehicle for personal or other business  
   Per Procedure 250-012-011 & Florida Administrative Code  
   $500.00 per occurrence/per day

i. Covering Department identification marking  
   Per Road Ranger Scope of Service  
   $500.00 per occurrence/per day

---

**PAYMENT OF REST AREA UTILITY BILLS**

Pay all utility bills (water, electric, sewer) associated with each Rest Area before the due date each month.

**Utility Bill Payment Performance Criteria**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to pay utility bill on time</td>
<td>As per specific utility bill due date</td>
<td>25% of total amount of utility bill per month</td>
</tr>
<tr>
<td>b. Utility is disconnected at facility due to non-payment</td>
<td>$5,000 per day per occurrence until utility is restored</td>
<td></td>
</tr>
</tbody>
</table>

---

**PAYMENT OF WELCOME CENTER UTILITY BILLS**

Pay all utility bills (water, electric, sewer) associated with the Rest Area portion of each Welcome Center before the due date each month.

**Utility Bill Payment Performance Criteria**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to pay utility bill on time</td>
<td>As per specific utility bill due date</td>
<td>25% of total amount of utility bill per month</td>
</tr>
<tr>
<td>b. Utility is disconnected at facility due to non-payment</td>
<td>$5,000 per day per occurrence until utility is restored</td>
<td></td>
</tr>
</tbody>
</table>

---

**PAYMENT OF ROADWAY ELECTRIC UTILITY BILLS**

Pay all electric utility bills associated with each Roadway covered by this contract.

**Utility Bill Payment Performance Criteria**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to pay utility bill on time</td>
<td>As per specific utility bill due date</td>
<td>25% of total amount of utility bill per month</td>
</tr>
<tr>
<td>b. Utility is disconnected at facility due to non-payment</td>
<td>$5,000 per day per occurrence until utility is restored</td>
<td></td>
</tr>
</tbody>
</table>
WEIGH STATIONS EXCLUDING SCALES

Perform maintenance and repair of all Weigh Stations including facilities, buildings, pavement, and grounds. The scope of this contract does not include maintenance and inspection of the Weigh Station scale system. Provide Weigh Station attendant(s) sufficient to comply with performance measures found in the Standard Scope of Services for Rest Area Maintenance (RA Scope) and in the Standard Scope of Services for Weigh Scales & Lightning Systems (Scale Scope). Ensure the controlled pavement at weigh scales continually meets the requirements of the Department of Agriculture and Motor Carrier Compliance. Ensure Weight Station lights properly illuminate the immediate area around the weigh scales and the areas where trucks are being weighed. Repair malfunctioning illuminating lights within twenty-four (24) hours of discovery of light outage.

Perform frequent Weigh Station inspections as required in the RA Scope and record the inspection results using the Quality Assessment Review â€“ Weigh Station Inspection Checklist (WS Checklist) form. Calculate Weigh Station scores from WS Checklists and maintain copies of checklists and scores in Contractor files. Achieve and maintain at least the minimum Weigh Station scores required by Department Procedure.

For each Weigh Station inspection, invite the Department to perform a simultaneous independent inspection also utilizing the WS Checklist. Depending on historical Contactor performance, the Department may or may not accept the invitation. Discuss inspection score results with the Department in order to identify and rectify any differences in inspection techniques and opinions. When simultaneous inspections are performed, the Department’s inspection score will become the official score upon which performance deductions are based. When the Department elects not to perform a simultaneous inspection, the Contractor’s inspection score will become the official score upon which performance deductions are based. For each monthly invoice, reduce the monthly lump sum amount by the total of all Weigh Station performance deductions.

<table>
<thead>
<tr>
<th>WEIGH STATION PERFORMANCE CRITERIA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>WEIGH STATIONS</strong></td>
</tr>
<tr>
<td>Deficiency Identification</td>
</tr>
<tr>
<td>a. Facility rating falls below minimum allowed</td>
</tr>
<tr>
<td>b. Facility closure due to Contractor negligence</td>
</tr>
</tbody>
</table>

PAYMENT OF WEIGH STATION UTILITY BILLS

Pay all utility bills (water, electric, sewer) associated with each Weight Station before the due date each month.

<table>
<thead>
<tr>
<th>WEIGH STATION UTILITY BILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency Identification</td>
</tr>
<tr>
<td>a. Failure to pay utility bill on time</td>
</tr>
<tr>
<td>b. Utility is disconnected at facility due to non-payment</td>
</tr>
</tbody>
</table>
a. Failure to pay utility bill on time
   As per specific utility bill due date 25% of total amount of utility bill per month
b. Utility is disconnected at facility due to non-payment $5,000 per day per occurrence until utility is restored

OVERLANE SIGN STRUCTURE INSPECTION AND MAINTENANCE

Perform overlane sign structure inspection and maintenance, including collision damage repair. Inspect overlane sign structures according to the Department’s Bridge and Other Structures Inspection Reporting Procedures Manual.

Overlane Sign Structure Performance Criteria

<table>
<thead>
<tr>
<th>OVERLANE SIGN STRUCTURES</th>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to perform timely Inspections</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td></td>
<td>$1,000 per day per delinquent inspection</td>
</tr>
<tr>
<td>b. Failure to timely submit Inspection Sheets/Reports</td>
<td>Within 60 days from inspection</td>
<td></td>
<td>$100 per day per delinquent report</td>
</tr>
<tr>
<td>c. Failure to make repairs identified in Inspection Reports</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td></td>
<td>$1,000 per day per overlane sign structure</td>
</tr>
<tr>
<td>d. Failure to make temporary safety repairs resulting from incidents</td>
<td>Must secure public safety from hazards and establish proper MOT before leaving the site</td>
<td></td>
<td>$1,000 per day per location</td>
</tr>
<tr>
<td>e. Failure to replace sign structures damaged by incidents</td>
<td>Temporary signs installed within 3 days Permanent signs installed within 180 days</td>
<td></td>
<td>Temporary signs $500 per day per location Permanent signs $500 per day per location</td>
</tr>
</tbody>
</table>

HIGH MAST LIGHT STRUCTURE INSPECTION AND MAINTENANCE

Perform all high mast light structure inspection and maintenance, including collision damage repair. Inspect high mast light structures according to the Department’s Bridge and Other Structures Inspection Reporting Procedures Manual.

High Mast Light Structure Inspection Performance Criteria

<table>
<thead>
<tr>
<th>HIGH MAST LIGHT POLES</th>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to perform timely Inspections</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td></td>
<td>$500 per day per delinquent inspection</td>
</tr>
<tr>
<td>b. Failure to timely submit Inspection Sheets/Reports</td>
<td>Within 60 days from inspection</td>
<td></td>
<td>$100 per day per delinquent report</td>
</tr>
<tr>
<td>c. Failure to make repairs identified in Inspection Reports</td>
<td>Per Department Procedures, Manuals, Codes, etc.</td>
<td></td>
<td>$1,000 per day per high mast light structure</td>
</tr>
<tr>
<td>d. Failure to make temporary safety repairs resulting from incidents.</td>
<td>Must secure public safety from hazards and establish proper MOT before leaving.</td>
<td></td>
<td>$1,000 per day per location</td>
</tr>
</tbody>
</table>

MOVABLE BRIDGE INSPECTION (Including Locals)
In accordance with the Florida Administrative Code (F.A.C.), request Department approval for all Bridge Inspection Team Leaders, Bridge Inspection Supervisors, and the approving Professional Engineer. Request for Department approval any changes in such personnel.

Inspect all publicly owned bridges, including off-system local bridges and other State Agency bridges, according to frequencies and criteria required by the Code of Federal Regulations, the F.A.C., the Department’s Bridge and Other Structures Inspection Reporting Procedures Manual, the Department’s Bridge Underwater Operations Manual, the Department’s Bridge Operations and Maintenance Manual, and other applicable Contract Documents. Create inspection reports using the Department's Bridge Management System. Furnish the Department with original signed and sealed inspection reports within timeframes established in these same Contract Documents.

As a part of bridge inspection duties, determine if a review of the current load rating capacity is warranted for each inspection. If warranted, perform revised bridge load rating analyses.

Immediately notify the Department verbally if field observations reveal deficiencies sufficiently critical to warrant immediate and substantial traffic restriction or closing of the bridge. Confirm the verbal notification with a written notification within twenty-four (24) hours.

Maintain all bridge records in Contractor files at all times in preparation for audit reviews. Ensure bridge inspectors attend appropriate bridge inspection training as provided by the Department. The Department will provide District-specific Quality Control checklists/criteria to the Contractor. The Department (District) will perform quality assurance reviews using these checklists by inspecting bridges that have been previously inspected by the Contractor and by reviewing the inspection records for conformity with the Department's findings.

### Bridge Inspection Performance Criteria

<table>
<thead>
<tr>
<th>BRIDGE INSPECTION</th>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Failure to perform timely Bridge Inspections</td>
<td>Per Procedures, Codes, Manuals, etc.</td>
<td>$1,000 per day per delinquent inspection</td>
</tr>
<tr>
<td></td>
<td>b. Failure to timely submit Inspection Sheets/Reports</td>
<td>Within 60 days from inspection</td>
<td>$500 per day per delinquent report</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUALITY CONTROL</th>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a. Bridge inspection District QAR score falls below minimum allowed</td>
<td>Per Procedures, Codes, Manuals, District-provided QAR checklist, etc.</td>
<td>Per District-provided QAR checklist and criteria</td>
</tr>
</tbody>
</table>

### NON-MOVABLE BRIDGE INSPECTION (Including Locals)

In accordance with the Florida Administrative Code (F.A.C.), request Department approval for all Bridge Inspection Team Leaders, Bridge Inspection Supervisors, and the approving Professional Engineer. Request for Department approval any changes in such personnel.

Inspect all publicly owned bridges, including off-system local bridges and other State Agency bridges, according to frequencies and criteria required by the Code of Federal Regulations, the F.A.C., the Department’s Bridge and Other Structures Inspection Reporting Procedures
Manual, the Department’s Bridge Underwater Operations Manual, the Department’s Bridge Operations and Maintenance Manual, and other applicable Contract Documents. Create inspection reports using the Department's Bridge Management System. Furnish the Department with original signed and sealed inspection reports within timeframes established in these same Contract Documents.

As a part of bridge inspection duties, determine if a review of the current load rating capacity is warranted for each inspection. If warranted, perform revised bridge load rating analyses.

Immediately notify the Department verbally if field observations reveal deficiencies sufficiently critical to warrant immediate and substantial traffic restriction or closing of the bridge. Confirm the verbal notification with a written notification within twenty-four (24) hours.

Maintain all bridge records in Contractor files at all times in preparation for audit reviews. Ensure bridge inspectors attend appropriate bridge inspection training as provided by the Department. The Department will provide District-specific Quality Control checklists/criteria to the Contractor. The Department (District) will perform quality assurance reviews using these checklists by inspecting bridges that have been previously inspected by the Contractor and by reviewing the inspection records for conformity with the Department's findings.

### Bridge Inspection Performance Criteria

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to perform timely Bridge Inspections</td>
<td>Per Procedures, Codes, Manuals, etc.</td>
<td>$1,000 per day per delinquent inspection</td>
</tr>
<tr>
<td>b. Failure to timely submit Inspection Sheets/Reports</td>
<td>Within 60 days from inspection</td>
<td>$500 per day per delinquent report</td>
</tr>
</tbody>
</table>

### QUALITY CONTROL

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Bridge inspection District QAR score falls below minimum allowed</td>
<td>Per Procedures, Codes, Manuals, District-provided QAR checklist, etc.</td>
<td>Per District-provided QAR checklist and criteria</td>
</tr>
</tbody>
</table>

### MOVABLE BRIDGE MAINTENANCE (INCLUDE PERIODIC MAINTENANCE AND MAJOR REPAIR)

Bridge tasks are divided into appropriate maintenance activities as described in the Departments Maintenance Cost Handbook. Perform Routine/Preventive Bridge Maintenance and Minor Repair, and Periodic Maintenance and Major Repair, including collision damage repair, defined as follows:

(a) Routine/Preventive Maintenance: The preservation and upkeep of a structure, including all its appurtenances, maintenance and servicing of mechanical, electrical and hydraulic systems, in its original condition (or as subsequently improved) insofar as practical. Preventive maintenance includes any activity intended to maintain an existing condition or to prevent deterioration. Examples include but are not limited to: cleaning, lubrication, spot painting, dirt and debris removal, and application of protective systems. Ideally, preventive maintenance is anticipated (i.e. planned) routine maintenance and does not require a Bridge Work Order to accomplish the work.
(b) Minor Repair: The restoration of a structure, including all its appurtenances, to its original condition (or as subsequently improved) insofar as practical. Minor repairs include any activity intended to correct the effects of minor material deterioration by restoring the damaged member. Minor repairs are generally defined as repairs to bridge elements that are structurally sound (i.e., no loss of strength), but may have minor section loss, cracking, spalling, or scour. Minor repairs are un-anticipated routine maintenance, usually identified by bridge inspectors and require a Work Order to schedule and accomplish the work. Examples include but are not limited to repair and/or replacement of an in-kind deck joint and localized material restoration of: deck expansion joints and joints system, deck surfaces, sidewalks, drainage systems, bridge railing systems, superstructure members and bearing devices, substructure members, waterway channels, approach slabs, anchorages, all fender system components, mechanical, electrical or hydraulic systems, replacement of individual parts of the mechanical, electrical or hydraulic systems and structural crack injection and matrix loss restoration. Should a joint or joint system be partially or completely damaged, then the entire bridge width of the joint and affected nosing portion of joint system shall be replaced.

(c) Periodic Maintenance and Major Repair: The restoration of a structure, including all its appurtenances, to its original condition (or as subsequently improved) insofar as practical. Major repairs include any activity intended to correct deteriorated members. Conditions requiring major repairs include loss of section, deterioration, spalling, or scour that affect the strength of the member, replacement or upgrading of the mechanical, electrical or hydraulic systems. Engineering analysis is often performed to determine the extent of the lost strength. Examples include but are not limited to localized or full material restoration of: deck expansion joints and joint systems, deck surfaces, sidewalks, drainage systems, bridge railing systems, superstructure members and bearing devices, substructure members, waterway channels, approach slabs, anchorages, all fender system components, concrete restoration requiring reinforcement splicing, structural crack injection and matrix loss restoration, and metal fabrication to restore the integrity of or to replace structural elements.

The scope of this contract does not include performance of Bridge Rehabilitation defined as follows:

(a) Rehabilitation: The improvement or betterment of a structure, including all its appurtenances, to a condition meeting or exceeding current design standards, insofar as practical. Examples of rehabilitation include: widening a bridge to meet lane/shoulder width requirements, replacement of substandard bridge rails, raising a bridge to meet clearance requirements, strengthening a bridge to increase load carrying capacity to accepted limits, and upgrading the operational equipment of a movable span.

The Department (District) will periodically perform quality assurance reviews by inspecting bridge repairs and maintenance activities recently completed by the Contractor.

### Bridge Maintenance Performance Criteria

<table>
<thead>
<tr>
<th>BRIDGE MAINTENANCE</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to timely make repairs identified in bridge work orders (delinquent work orders)</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$1,000 per day per delinquent work order</td>
</tr>
<tr>
<td>b. Failure to make temporary safety repairs resulting from hazards and establish</td>
<td>Must secure public safety</td>
<td>$1,000 per day per location</td>
</tr>
</tbody>
</table>
Table: Incidents

<table>
<thead>
<tr>
<th>Incidents</th>
<th>Action</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>c. Failure to replace or repair</td>
<td>Temporary Repairs within 24 hrs of</td>
<td>Temporary repairs $2000 per day per location</td>
</tr>
<tr>
<td>damaged bridge railing</td>
<td>notification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Permanent Repairs within 7 days of</td>
<td>Permanent repairs $1000 per day per location</td>
</tr>
<tr>
<td></td>
<td>notification</td>
<td></td>
</tr>
</tbody>
</table>

### NAVIGATION LIGHTING

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to temporarily</td>
<td>Per Performance Lighting</td>
<td>Per Performance Lighting Specifications (SMSP)</td>
</tr>
<tr>
<td>repair outage following</td>
<td>Specifications</td>
<td>Per Performance Lighting Specifications (SMSP)</td>
</tr>
<tr>
<td>notification or discovery</td>
<td>(Standard Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special Provisions)</td>
<td></td>
</tr>
<tr>
<td>b. Failure to permanently</td>
<td>Per Performance Lighting</td>
<td>Per Performance Lighting Specifications (SMSP)</td>
</tr>
<tr>
<td>repair outage following</td>
<td>Specifications</td>
<td>Per Performance Lighting Specifications (SMSP)</td>
</tr>
<tr>
<td>notification or discovery</td>
<td>(Standard Maintenance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Special Provisions)</td>
<td></td>
</tr>
</tbody>
</table>

### QUALITY CONTROL

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to properly</td>
<td>Per Procedures, Manuals,</td>
<td>$500 per day per location until deficient repair is corrected</td>
</tr>
<tr>
<td>complete bridge repairs</td>
<td>Codes, Design Standards, etc.</td>
<td></td>
</tr>
<tr>
<td>as identified through</td>
<td></td>
<td></td>
</tr>
<tr>
<td>District QAR</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NON-MOVABLE BRIDGE MAINTENANCE (INCLUDING PERIODIC MAINTENANCE AND MAJOR REPAIR)

Bridge tasks are divided into appropriate maintenance activities as described in the Departments Maintenance Cost Handbook. Perform Routine/Preventive Bridge Maintenance and Minor Repair, and Periodic Maintenance and Major Repair, including collision damage repair, defined as follows:

(a) Routine/Preventive Maintenance: The preservation and upkeep of a structure, including all its appurtenances, maintenance and servicing of mechanical, electrical and hydraulic systems, in its original condition (or as subsequently improved) insofar as practical. Preventive maintenance includes any activity intended to maintain an existing condition or to prevent deterioration. Examples include but are not limited to: cleaning, lubrication, spot painting, dirt and debris removal, and application of protective systems. Ideally, preventive maintenance is anticipated (i.e. planned) routine maintenance and does not require a Bridge Work Order to accomplish the work.

(b) Minor Repair: The restoration of a structure, including all its appurtenances, to its original condition (or as subsequently improved) insofar as practical. Minor repairs include any activity intended to correct the effects of minor material deterioration by restoring the damaged member. Minor repairs are generally defined as repairs to bridge elements that are structurally sound (i.e., no loss of strength), but may have minor section loss, cracking, spalling, or scour. Minor repairs are un-anticipated routine maintenance, usually identified by bridge inspectors and require a Work Order to schedule and accomplish the work. Examples include but are not limited to repair and/or replacement of an in-kind deck joint and localized material restoration of: deck expansion joints and joints system, deck surfaces, sidewalks, drainage systems, bridge railing systems, superstructure members and bearing devices, substructure members, waterway channels, approach slabs, anchorages, all fender system components, mechanical, electrical or
hydraulic systems, replacement of individual parts of the mechanical, electrical or hydraulic systems and structural crack injection and matrix loss restoration. Should a joint or joint system be partially or completely damaged, then the entire bridge width of the joint and affected nosing portion of joint system shall be replaced.

(c) Periodic Maintenance and Major Repair: The restoration of a structure, including all its appurtenances, to its original condition (or as subsequently improved) insofar as practical. Major repairs include any activity intended to correct deteriorated members. Conditions requiring major repairs include loss of section, deterioration, spalling, or scour that affect the strength of the member, replacement or upgrading of the mechanical, electrical or hydraulic systems. Engineering analysis is often performed to determine the extent of the lost strength. Examples include but are not limited to localized or full material restoration of: deck expansion joints and joint systems, deck surfaces, sidewalks, drainage systems, bridge railing systems, superstructure members and bearing devices, substructure members, waterway channels, approach slabs, anchorages, all fender system components, concrete restoration requiring reinforcement splicing, structural crack injection and matrix loss restoration, and metal fabrication to restore the integrity of or to replace structural elements.

The scope of this contract does not include performance of Bridge Rehabilitation defined as follows:

(a) Rehabilitation: The improvement or betterment of a structure, including all its appurtenances, to a condition meeting or exceeding current design standards, insofar as practical. Examples of rehabilitation include: widening a bridge to meet lane/shoulder width requirements, replacement of substandard bridge rails, raising a bridge to meet clearance requirements, strengthening a bridge to increase load carrying capacity to accepted limits, and upgrading the operational equipment of a movable span.

The Department (District) will periodically perform quality assurance reviews by inspecting bridge repairs and maintenance activities recently completed by the Contractor.

**Bridge Maintenance Performance Criteria**

<table>
<thead>
<tr>
<th>BRIDGE MAINTENANCE</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to timely make repairs identified in bridge work orders (delinquent work orders)</td>
<td>Per Procedures, Manuals, Codes, etc.</td>
<td>$1,000 per day per delinquent work order</td>
</tr>
<tr>
<td>b. Failure to make temporary safety repairs resulting from Incidents</td>
<td>Must secure public safety from hazards and establish proper MOT before leaving the site</td>
<td>$1,000 per day per location</td>
</tr>
<tr>
<td>c. Failure to replace or repair damaged bridge railing</td>
<td>Temporary Repairs within 24 hrs of notification Permanent Repairs within 7 days of notification</td>
<td>Temporary repairs $2000 per day per location Permanent repairs $1000 per day per location</td>
</tr>
</tbody>
</table>

**NAVIGATION LIGHTING**

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Failure to temporarily repair outage following notification</td>
<td>Per Performance Lighting Specifications (Standard)</td>
<td>Per Performance Lighting Specifications (SMSP)</td>
</tr>
<tr>
<td>or discovery</td>
<td>Maintenance Special Provisions</td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------</td>
<td></td>
</tr>
<tr>
<td>b. Failure to permanently repair outage following notification or discovery</td>
<td>Per Performance Lighting Specifications (Standard Maintenance Special Provisions)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Per Performance Lighting Specifications (SMSP)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>QUALITY CONTROL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency Identification</td>
</tr>
<tr>
<td>a. Failure to properly complete bridge repairs as identified through District QAR</td>
</tr>
</tbody>
</table>

**MOVABLE BRIDGE TENDING & PREVENTATIVE MAINTENANCE**

Perform movable bridge tending duties and preventative maintenance according to the *Standard Scope of Services for Bridge Tending and Preventative Maintenance*.

<table>
<thead>
<tr>
<th>MOVABLE BRIDGE OPERATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency Identification</td>
</tr>
<tr>
<td>a. Failure to operate bridges in accordance with procedures</td>
</tr>
</tbody>
</table>

**PAYMENT OF MOVABLE BRIDGE UTILITY BILLS**

Pay all utility bills (water, electric, sewer) associated with each Movable Bridge before the due date each month.

**Utility Bill Payment Performance Criteria**

<table>
<thead>
<tr>
<th>MOVABLE BRIDGE UTILITY BILLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency Identification</td>
</tr>
<tr>
<td>a. Failure to pay utility bill on time</td>
</tr>
<tr>
<td>b. Utility is disconnected at facility due to non-payment</td>
</tr>
</tbody>
</table>

**TRAFFIC SIGNAL MAINTENANCE**

Maintain all flashing signs and traffic signals that are not covered by a maintenance agreement with a city or county. Perform maintenance according to applicable procedures, specifications, and other contract documents.

**Traffic Signal Maintenance Performance Criteria**

<table>
<thead>
<tr>
<th>TRAFFIC SIGNAL MAINTENANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deficiency Identification</td>
</tr>
<tr>
<td>a. Failure to make temporary safety repairs resulting from Incidents</td>
</tr>
<tr>
<td>b. Failure to repair damaged or malfunctioning signal or flashing sign</td>
</tr>
</tbody>
</table>
TRAFFIC OPERATIONS WORK ORDERS

Perform or construct all Traffic Operations Work Orders as directed by the Department. The Department will separately compensate the Contractor for all work performed on Traffic Operations Work Orders up to the amount provided in the Traffic Operations Work Orders Pay Item as established pre-bid.

Traffic Operations Work Orders Performance Criteria

<table>
<thead>
<tr>
<th>Deficiency Identification</th>
<th>Time Allowed/Criteria</th>
<th>Deduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Traffic Operations Work Order not completed within allowed timeframe</td>
<td>Work must be completed within timeframe established in Work Order.</td>
<td>1% of Work Order amount per day late</td>
</tr>
<tr>
<td>b. Traffic Operations Work Order not completed correctly or according to requirements</td>
<td>Work must be completed according to requirements established in the Work Order, procedures, specifications, and other Contract Documents.</td>
<td>Re-perform the work until correct plus any deductions due to exceeding allowed timeframe</td>
</tr>
</tbody>
</table>

INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

INSERT DISTRICT-SPECIFIC ITS SCOPE HERE. Perform all ITS activities according to the ITS performance measures identified in the State Traffic Engineering & Operations Office website. INSERT DISTRICT-SPECIFIC ITS PERFORMANCE DEDUCTIONS HERE

ATTACHMENTS

Attachments I thru III are incorporated into this contract.

PAYMENT SCHEDULE

The Contractor shall be paid monthly according to the schedule below. For all contract years of the original contract term, the monthly dollar amount will be the total Contract amount multiplied by the monthly factor listed below divided by number of years of original contract term. If renewal is allowed, the monthly dollar amount will be the total Renewal amount multiplied by the monthly factor listed below divided by number of years of renewal term.

<table>
<thead>
<tr>
<th>Month</th>
<th>Contract Year 1</th>
<th>Middle Contract Years</th>
<th>Final Year of Original Term</th>
<th>Each Renewal Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.100</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>2</td>
<td>0.100</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>3</td>
<td>0.075</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>4</td>
<td>0.075</td>
<td>0.084</td>
<td>0.090</td>
<td>0.084</td>
</tr>
<tr>
<td>5</td>
<td>0.075</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>6</td>
<td>0.075</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>7</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>8</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
</tbody>
</table>
### 4. OTHER CONTRACTUAL REQUIREMENTS

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>10</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>11</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
<tr>
<td>12</td>
<td>0.070</td>
<td>0.083</td>
<td>0.090</td>
<td>0.083</td>
</tr>
</tbody>
</table>
HIGHWAY LIGHTING SYSTEM (PERFORMANCE)
(REV. 09-22-09) (01-10)

PAGE 813. The following is a new Section added at the end of Section 715 and is a Standard Maintenance Special Provision:

SECTION ME715-50
HIGHWAY LIGHTING SYSTEM (PERFORMANCE)
(REV. 09-22-09)

ME715-50-1 Description.

The highway lighting system consists of overhead, underdeck, sign and navigational lighting. Maintain the highway lighting system with a minimum of ninety percent (90%) of highway lighting (including Overhead, Underdeck and Sign Lighting) operational and one hundred percent (100%) of Navigational Lighting operational as describes below in ME715-50.2.2.

ME715-50-2 Requirements.

ME715-50-2.1 General: Possess a license to do business as a certified or registered electrical contractor pursuant to Chapter 489, Part II, Florida Statutes. Submit a copy of the license with the bid proposal package. All work is to be supervised by an onsite Journeyman Electrician possessing a current license from the local municipality or county.

Comply with all local licensing requirements and ordinances governing performance of the work. Perform all work in accordance with the laws of the State, all municipal ordinances, all regulations and requirements of the Public Service Commission, the National Electrical Code, the National Electrical Safety Code, the current edition of the Manual of Uniform Traffic Control Devices, the Florida Department of Transportation Design Standards for Design, Construction, Maintenance and Utility Operations on the State Highway System current at the time of the contract letting, and Department Standard Specifications. Employees will be familiar with and apply all appropriate safety practices during the life of this Contract. Training in the application of “Occupational Safety and Health Standards” (reference 29 of the Code of Federal Regulations, Part 1910.333) relating to “lockout and tagging” procedures will be MANDATORY for all persons employed on this Contract.

Immediately report to the Engineer any fatalities or serious injuries to either employees or members of the public and any extensive damage to property occurring during the performance of any of the work.

When substitutions are proposed for existing systems, they must be both functionally and aesthetically compatible with the existing components.

Maintain storage sites outside the right-of-way limits on any state maintained highway. Materials may be temporarily stored on the right-of-way outside of the clear recovery zone (excluding medians) for a period not to exceed twenty-four (24)-hours, if approved by the Engineer.

Adhere to the requirements of “Occupational Safety and Health Standards” (reference 29 of the Code of Federal Regulations, Part 1910), “Mobile and Locomotive Cranes” (American Society Mechanical Engineers International, ASME B30.5), and “Vehicle Mounted Elevating and Rotating Devices” (American National Standards Institute ANSI/SIA A92.2) for items relating to lifting devices (cranes, etc.).
ME715-50-2.2 Navigational Lighting: Navigational lighting outages that cannot be repaired within one (1) hour, during the periods when navigational lights are to be in operation, will require placement of temporary navigational lights until permanent repairs can be completed. Permanent repairs to any navigational lighting must be repaired within twenty-four (24) - hours.

ME715-50-2.3 Salvaged Materials: All replaced poles and parts will remain the property of the Department, unless determined by the Engineer to have no salvage value. Deliver all salvageable materials to storage sites identified by the Engineer. Dispose of all material in accordance with applicable Federal, State and local regulations. Provide documentation verifying proper disposal of all components removed containing mercury or other hazardous material.

ME715-50-2.4 Emergency Work: Be responsible at all times, including after normal work hours and weekends, for the immediate removal of downed poles or mast arms impeding traffic or threatening the public. Take immediate action to protect the safety of the traveling public by removing any elements of the pole assembly that may cause a hazard.

Replace light poles damaged by traffic within five (5) working days or within seven (7) working days if new foundations are required. Take immediate action to protect the safety of the traveling public by removing any elements of the pole assembly that may cause a hazard.

Repair the electrical system in a way that prevents electrical shock to the public, the Department’s and Contractor’s work force. Secure or replace any inspection plate, access panel cover or pull box cover that is not properly secured in place, damaged or missing.

Provide a contact person twenty-four (24)-hours-per-day and seven (7)-days-per-week including all holidays, for the duration of this Contract, to receive and respond to verbal and written work directions. This person will be required to respond, either in person or by telephone, within fifteen (15) minutes of being called or paged, and to report to emergency work site location(s) within one (1) hour after being notified.

ME715-50-3 Performance Measures.

The Department may perform highway lighting system inspections (Review of five (5) percent of the lighting, and a minimum of ten (10) for each cost center). The following performance measures will be used in determining the reduction to each monthly invoice. If, in any Department inspection, the performance measures are not met.

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>If the overhead, underdeck or sign lighting outage (individually or combined) exceeds ten percent (10%).</td>
<td>Reduction of $5000.00 per cost center.</td>
</tr>
<tr>
<td>2.</td>
<td>For periods in excess of two (2) hour when navigational lights (either permanent or temporary lights) are nonfunctional, during times when navigational lights should be in operation, following notification.</td>
<td>Reduction of $100.00 per hour or portion thereof, per bridge, reduction per cost center.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Penalty</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>3.</td>
<td>If any inspection plate, access panel cover or pull box cover is found to</td>
<td>Reduction of $250.00, each occurrence per cost center.</td>
</tr>
<tr>
<td></td>
<td>be damaged, not secured, or missing</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>If it is determined that the Contractor does not respond to an emergency</td>
<td>Reduction of $1000.00 per hour past the allowed response time or portion</td>
</tr>
<tr>
<td></td>
<td>site within one (1) hour of initial notification.</td>
<td>thereof, per incident per cost center.</td>
</tr>
</tbody>
</table>

**ME715-50-4 Basis of Payment.**

Price and payment will be full compensation for all work and costs specified under this section. Payment will be based upon the lump sum price divided into sixty (60) equal monthly payments.

Payment will be made under the item specified in the Bid Price Proposal.
Exhibit D.2

FDOT: AMPER User Guide

This user guide was produced to help districts conduct the AMPER (quality based performance monitoring) semi-annual evaluations. These evaluations take into account MRP evaluations and provide a well rounded contractor performance evaluation.

Reference:
Sumner, David. Personal interview. 19 July 2011

Used with permission by David Sumner.
ASSET MAINTENANCE CONTRACTOR
PERFORMANCE EVALUATION REPORT
(AMPER)

USER’S GUIDE
SECTION ONE

INSTRUCTIONS & GUIDANCE
for using the
ASSET MAINTENANCE CONTRACTOR
PERFORMANCE EVALUATION REPORT
On each page of this User’s Guide, you will see a small graphic of the entire worksheet currently being described. Further, the highlighted area of the miniature worksheet shows exactly what part of the worksheet the User’s Guide is currently focused on.

The official title of the “new AMMP” is the “Asset Maintenance Contractor Performance Evaluation Report” (called AMPER in this User’s Guide). The first sheet (or tab) of the workbook is called the “Performance Evaluation Report”, the 2nd sheet is called “Section I, II, III Details” (called AMPM in this User’s Guide) and the 3rd sheet is “Section V Details”. The tab names are shown at the bottom of the worksheet. You will need to provide data for each of these three worksheets. You will not need to use or enter data into the 4th sheet - it is for information only. Sheet 4 is the calculation worksheet for determining section weights.

Data for these 3 fields are automatically transferred over from worksheet #2.
The user will identify each Section included on their contract by checking the appropriate box. The “Y” or “N” indicator will display automatically.

Sections II, III, & IV are optional and should be checked based on what your contract included. At least one of these three Sections MUST be checked, otherwise red error indicators will appear.

Section V must be included on every contract.

Data must be entered by the user in all yellow fields. Data cannot be placed in any field not colored yellow.

This date indicates the last time the AMPER was updated. Wherever OOM updates the AMPER, OOM will update this field.

Section I must be included on every contract.

Check the “Structures Included” box if your contract covers bridges or ANY kind of ancillary structures (light poles, mast arms, overhead sign structures).

All fields colored this light green (all SubScores and Section Scores) contain scores that are based on a scale where the Minimum Acceptable Performance is 70 (just like the overall score). This is shown for information purposes so the District and the Contractor can see quickly and precisely where performance is lacking or excelling.

Any field colored red means one of two things: 1) The field contains incorrect or impossible data or 2) The field cannot be calculated because it needs information from other fields that contain incomplete data. In most cases, if other fields are causing the problem, they are also colored red.

<table>
<thead>
<tr>
<th>Sections included in Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section</td>
</tr>
<tr>
<td>AMPM - I</td>
</tr>
<tr>
<td>Rest Areas - II</td>
</tr>
<tr>
<td>Structures - III</td>
</tr>
<tr>
<td>MRP - IV</td>
</tr>
<tr>
<td>Evaluation - V</td>
</tr>
</tbody>
</table>

COLOR CODE LEGEND:

- User Input Field
- Compare this Score to Minimum Acceptable Score of 70
- Error/Incomplete Warning
Section I evaluates 47 standard (plus 7 user-defined) pass/fail performance indicators. Indicators are divided into 4 main performance categories for convenience & aesthetic purposes. Each of the 47+7 individual indicators is equally weighted. Indicators include many, but not all, contractor responsibilities. Some indicators are based on contractual performance measures, while other indicators are based on general procedural/policy requirements. Section I must be completed for all Asset Maintenance contracts. All data for Section I is entered on the AM PM worksheet (2nd tab).

<table>
<thead>
<tr>
<th>Section I - AM Perf Measures</th>
<th>Number of Indicators</th>
<th>Not In Contract</th>
<th>Does Not Meet</th>
<th>Performance Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Safety Features and Inspections</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B) Administration</td>
<td>13</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C) Contractor Response</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D) Field Operation</td>
<td>17</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>54</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

For each indicator category, the number for indicators shown must equal the sum of the 3 columns to the right of this column. If unequal, cells will turn red indicating that some data in the AMPM sheet is missing.

Click on any of the blue hyperlinks (they turn purple after clicking) to take you straight to associated compliance indicators on the AMPM sheet.

When evaluating a performance indicator, choose “Not In Contract” ONLY if your contractor is never required to perform this task per contract language.

Choose “Does Not Meet” only if it is known that the contractor has failed to meet performance criteria.

Choose “Performance Met” if contractor meets performance criteria or if indicator was not evaluated (but still a contractual requirement) or if it is unknown if performance was met.

The Section Score to the left counts toward this % of the total overall AMPER score. This % will change based on what is included in your contract, as determined by the various checkboxes selected on this form. This % should not change for the life of your contract unless your contract is amended and your checkbox statuses change.

The Section Score to the right is the % of the total overall AMPER score.

Compare this Section Score to a “minimum acceptable” 70 to gauge Section I performance.

For each indicator category, the number for indicators shown must equal the sum of the 3 columns to the right of this column. If unequal, cells will turn red indicating that some data in the AMPM sheet is missing.
Section II combines pass/fail performance indicators along with results from Rest Area inspection reports collected over the evaluation period. Indicators are divided into 2 performance categories, with each category weighted differently. Section II is only completed if your contract includes Rest Area management. Data for the inspection results is entered here, but data for the indicators is entered on the AMPM sheet.

Enter here what procedure/contract requires as a minimum acceptable Rest Area monthly inspection score. This is usually 90.

Enter the total number of Rest Area inspections (Form# 850-045-002) that were performed by contractor and Department, jointly and separately, during the review period.

Average together all inspection scores that “failed” (were less than target). Enter result here. Decimals are ok. If all inspections passed, this entire row is removed from view.

Of the total number of inspection performed, enter how many were at least as good as the target score.

### Section II - Rest Areas (RA)

<table>
<thead>
<tr>
<th>Category</th>
<th>Target Score</th>
<th>Total # of Rest Area Inspections</th>
<th># of Passing Inspections</th>
<th>SubScore</th>
<th>Weight</th>
<th>Subtotal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rest Area Monthly / Periodic Inspections</td>
<td>90</td>
<td>46</td>
<td>43</td>
<td>68.5</td>
<td>40%</td>
<td>27.4</td>
</tr>
<tr>
<td>Severity of Rest Area Inspection Failures</td>
<td>Average Score of Failed RA ---</td>
<td>83</td>
<td></td>
<td>79.0</td>
<td>20%</td>
<td>15.8</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Indicators</th>
<th>Not In Contract</th>
<th>Does Not Meet</th>
<th>Performance Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Rest Area Comment Cards</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>B) Rest Area Security</td>
<td>5</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Click on any of the blue hyperlinks (they turn purple after clicking) to take you straight to associated compliance indicators on the AMPM sheet.

For each indicator category, the number for indicators shown must equal the sum of the 3 columns to the right of this column. If unequal, cells will turn red indicating that some data in the AMPM sheet is missing.

Note that if all indicators are marked as “Not In Contract” on the AMPM, the entire category is removed from view, removed from the calculations, and Section II sub-weights are readjusted accordingly.

Compare this Section Score (and the SubScores above) to a “minimum acceptable” 70 to gauge Section II performance.

Note each subcategory has different weights that adjust based on evaluation conditions.
Section III combines pass/fail performance indicators along with results from standard Structure Quality Assurance Reviews of inspection and work order repairs. Indicators are divided into 5 performance categories, but each is weighted the same. Section III is completed if your contract includes inspection or maintenance of bridges or any other ancillary structure listed as a checkbox. If your contract does not include bridges, but does include high-mast light poles, then this section WILL be included as a part of your AMPER. Data for the inspection results is entered here, but data for the indicators is entered on the AMPM.

**IMPORTANT!** Be sure to check or uncheck the eight(8) checkboxes to correctly reflect which type of structures and what type or structures activities (maintenance, Inspection, or both) are included in your contract.

<table>
<thead>
<tr>
<th>Compliance Indicator Categories</th>
<th>Number of Indicators</th>
<th>Not In Contract</th>
<th>Does Not Meet</th>
<th>Performance Met</th>
</tr>
</thead>
<tbody>
<tr>
<td>A) Maintenance and Repair Work Orders</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>B) Movable Bridge Operations</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>C) Personnel Qualifications</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>D) Structures Inspections</td>
<td>12</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>E) Customer Service/Communication</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>21</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

As you check or uncheck structures option boxes, sub-section and overall section weights can change, depending on your box choices. Not only do these choices affect the Structures Section weights, they also affect the weights of the other 4 sections.
Field QA of Priority 1 WO is a summary of the results of all completed Priority 1 structures work orders performed during this evaluation period. IMPORTANT: Be sure to ask your Structures section to rate each QA result as the contractor either did an unacceptable job (FAILED) or an acceptable job (PASSED). Summarize the results here. Also note that this item does not take into consideration if the WO was completed on time. Delinquency is addressed in row 41. If the contractor was late on a Type 1 WO, but did a good job on the repair, this item would be PASSING. Field QA of Priority 2 WOs is handled exactly like Priority 1 WOs. For both Priorities, more than 2 failed QAs will trigger a Performance Adjustment Factor.

Field QA of Structures Inspections is a summary of the results of all the structure inspection quality assurances performed during this evaluation period. This will not require any field work at the time you complete the AMPER – your Structure Division should have already performed the necessary QAs through the normal course of business. IMPORTANT: Be sure to ask your Structures Division to rate each QA result as the contractor either did an unacceptable job (FAILED) or an acceptable job (PASSED) or an OUTSTANDING job on the inspection. Summarize the results here. These fields are auto calculated based on number of QAs performed as entered in the fields to the right.

Field QA of Priority 3 WO is handled exactly like the Priority 1 & 2 WOs. The only difference is that your structures office will usually be reporting only sample of type 3 WOs performance rather than all of them, since procedure does not require that all Type 3 WOs be inspected.

Number of Delinquent WOs: Of the Type 1 & 2 WOs that were QA reviewed, report how many of them were delinquent (completed beyond allowed time to complete). Any delinquencies will trigger a Performance Adjustment Factor.
Section IV uses results from periodic MRP (Maintenance Rating Program) evaluations and Interim MRP evaluations to generate a performance score. No additional QA/inspection work is performed for this section – it is simply a summary of results already collected. All data for the MRP results are entered here; you will not need the other worksheets to complete this section.

Enter the total number of Elements and Characteristics review and scored during this AMPER review period. This number looks at rolled-up results, NOT at each Facility Type (FT). For Elements, this number will almost always be 5 or 10 depending upon if there were one or two MRP periods.

Enter the overall MRP performance score required by contract documents. This target score will normally be 80 (the AMPER default), but can be changed if your contract requires something different.

There are usually 3 MRP cycles each year while this AMPER is completed twice per year. Consequently, every other AMPER will cover 2 MRP cycles. When this is the case, average the 2 overall MRP scores together and enter the result here. Decimal places are ok. If your AMPER covers only one MRP period, enter the single overall MRP score.

Unlike other Sections, the MRP Section figures a Section Score by using the LOWEST of the SubScores (to the left) for each MRP category.

Enter the total number of Characteristic review and scored during Interim MRP evaluations performed during this AMPER review period. This number looks at each Facility Type (FT) separately. For example, if 2 Characteristics were reviewed over 3 FTs, a “6” would be entered here.

Enter the number of Interim MRP Characteristics reviewed that fell below the minimum MRP Characteristic score allowed (usually 70, but may be different for your contract).

Enter the number of Elements and Characteristics reviewed that fell below the minimum MRP score allowed (usually 70 for Characteristics & 75 for Elements, but these may be different for your contract).
Section V is a subjective section where the score is determined based on how the District feels about overall performance of the AM Contractor. This section is specifically intended to be subjective in order to provide an avenue for the Department to call out excellent or poor performance, maybe intangible, that might not be captured elsewhere on the AMPER. This Section should be a consensus of District opinion by collecting input from the AM Project Manager, Contract inspectors, Cost Center manager, Maintenance Section Head, outside agencies and any other party who may have a sense of overall contractor performance. Scores will be automatically transferred from AMMP. All data for this Section is entered on the AMPM sheet.

The maximum rating possible for each of the four performance categories is 10. The minimum is a 4. Follow the rating guide on the AMPM sheet.

Two points will be added to the AM Contractor score if their score from the four performance categories exceeds 31. Note that these two points cannot bring the Section Score to more than 100.

Section V Detail sheet.

Click on any of the blue hyperlinks to take you straight to associated rating box on the Section V Detail sheet.

“Rating Achieved” fields are automatically transferred over from the Section V Detail sheet.
This is the Final Contractor Performance Evaluation Score. This score is the sum of the Weighted Scores of each of the 5 Sections. Like all Section Scores and SubScores on this AMPER, the Final Score can be compared to a minimum acceptable score of 70. Record this score, along with the evaluator name and date range of this AMPER, in Trns*port as a new Contractor Evaluation (add new).
Enter data for these 3 fields here – the info will automatically appear on the Performance Evaluation Report (PER) sheet. Be sure the Contractor name will fit on the PER sheet since that box is smaller than this box.

Enter a rate range for the date field, covering the entire AMPER evaluation period.

Use the drop-down box provided for each entry in this column. The drop-down gives three choices: “Performance Met” “Does Not Meet”, and “Not in Contract”. No other entry is accepted. To delete an entry, use the delete key on the keyboard.

Provide evaluation result details in the Remarks column. Describe observations made and actions taken during the 6-month evaluation period. Provide enough detail so that anyone can review the remarks and have a good picture of how the contractor is doing, but not so much detail that the reader may feel overwhelmed or confused. Note that the Remarks box will automatically expand if you fill up the default size of the box. You will almost always want to put some comment, even if very short, for each indicator.

Click on the reference tool to review the governing Contract Document associated with each Compliance Indicator. Some links go straight to the appropriate document, while some go to a website where the document is located.

The District will verify that the Contractor is meeting these indicated performance requirements. Seven of these are contract specific as defined by the user.

Enter data for these 3 fields here – the info will automatically appear on the Performance Evaluation Report (PER) sheet. Be sure the Contractor name will fit on the PER sheet since that box is smaller than this box.

Enter a rate range for the date field, covering the entire AMPER evaluation period.

Use the drop-down box provided for each entry in this column. The drop-down gives three choices: “Performance Met” “Does Not Meet”, and “Not in Contract”. No other entry is accepted. To delete an entry, use the delete key on the keyboard.

Provide evaluation result details in the Remarks column. Describe observations made and actions taken during the 6-month evaluation period. Provide enough detail so that anyone can review the remarks and have a good picture of how the contractor is doing, but not so much detail that the reader may feel overwhelmed or confused. Note that the Remarks box will automatically expand if you fill up the default size of the box. You will almost always want to put some comment, even if very short, for each indicator.

Click on the reference tool to review the governing Contract Document associated with each Compliance Indicator. Some links go straight to the appropriate document, while some go to a website where the document is located.
Under the heading of Review Type and Sample size where a type 2 review is required, it will be up to the District to fill in the number of samples/size of samples at the beginning of the 6-month review period and will make the AM Contractor aware of this. If the District is confidence of compliance they may waive any reviews.

For each compliance indicator that calls for the District to determine the number of samples to be reviewed (usually Type 2 reviews), the number of samples shall be based on the District’s confidence level of AMC performance. At the beginning of the 6-month review period, the District shall fill in the selected number of samples into the user input box to the left of the compliance indicator. The number of samples selected shall be made known to the AMC at the beginning of the 6-month review period.

For all times allowed in all Compliance Indicators, the District Maintenance Department Head may grant a time extension for unusual circumstances if the extension is requested during the original time period allowed.

If any Compliance Indicators shown below are not in accordance with the Contract Documents, the Contract Documents shall govern.

Fields where use input is required are color coded as: User Input Field

User input is allowed (and sometimes required) in any field on the AMPER shaded this yellow color.

Contract Document shall govern over any requirement shown in the Compliance Indicators field.

If unusual circumstances occur the District may grant extra time for the AM Contractor to achieve a performance met rating.
Each Compliance Indicator shall be evaluated according to the Review Type indicated. There are three different Review Types:

1.) Quality Assurance (QA) Inspection of Records / Work Orders - A review of Department and/or Contractor inspection action records and reports to ensure proper inspections were performed and corrective action taken. All (100%) records must be reviewed unless otherwise indicated. A field QA is NOT to be performed for this type of review; the District will trust that the contractor's records are accurate and honestly reported. The contractor should be cautioned against breaching this trust as this could seriously damage Department/Contractor relations, and may result in declaring the contractor non-responsible and/or in default.

Review Type 1 will be an office review of records/work orders /reports /corrective action taken. This review will look at AM Contractor records and may look at District records. All reviews will be office only - no field work or additional inspections. A very important concept behind this type of review is the District’s trust of AM contractor records. The District will trust that contractor records & reports are accurate. This concept makes the District’s QA task easier and builds trust and partnering with the contractor. However, if a contractor ever breaches this trust with misleading or inaccurate documents/reports, this is a serious offense to the contracting relationship and should be dealt with sternly. Make a point to inform your contractor of this trust concept and caution against a breach of trust. If a District suspects inaccurate contractor data or doubts report validity, a field inspection may be performed to verify records, but only with close coordination with the Contractor as to why the District is performing the field review. Note that Type 1 compliance indicators require 100% compliance unless otherwise indicated.

2.) Quality Assurance (QA) Inspection/Field Review - A field review of randomly selected locations. Process to randomly select QA locations is at District discretion. The process should be openly shared with the contractor. Number of samples (or percent of total samples) to review must be established at the beginning of the period as described above. Random locations should be selected when the QA review is performed.

Review Type 2 will be a field review of randomly selected locations. Location randomization is up to the District. The District must pre-establish a sample size on which to perform a Type 2 review. The sample size must be set at the start of the AMPER evaluation period and made known to the contractor. The sample size can be a set number of samples or a percent of samples or some other way to identify a sample set. The sample size should be based on the District’s confidence in contract performance – more sample for less confidence, fewer (or none) samples for high confidence. The sample locations should not be pre-determined, but should be established at the time of field review. Note that Type 2 compliance indicators indicate a specific percent compliance the contractor must achieve to receive a “Performance Met” rating.
Review Type 3 will be a summary of deficiencies the District discovers or becomes aware of during the 6-month AMPER evaluation period. It is VERY important that the District shall not actively seek out deficiencies. Some examples as to how a district may find an indicator as “Performance Not Met” would be if a 3rd party called to complain about improper M.O.T. setup (and the violation was verified) or the Coast Guard calls due to failure to open a movable bridge or the District notices that a guardrail or attenuator has remained damaged beyond the time allowed to repair. All Type 3 review items will be rated as “Performance Met” unless there is some evidence that performance standards were not met. This means, that if the District does not know if the contractor met all performance standards for a compliance indicator, then the contractor is assumed to have met performance. Here is a good way to think of Review Type 3:

The Department assumes that our contractors are putting forth good-faith effort to meet performance measures, thus the Department assumes that the Contractor will always meet performance requirements. Therefore, there is no need to spend Department resources to verify performance has been met. However, if the District discovers the contractor did not meet performance requirements, the District has an avenue (the AMPER) to reflect this failure to perform.

Note that a single discovery of failure to meet a Review Type 3 performance measure is grounds for a “Does Not Meet” rating.
**Example - Classification of Compliance Indicators.**

**Example - Compliance Indicators, including timeframes.**

**Example - This is the drop-down box where the user can select the evaluation result.**

**Example - Types of requires QA reviews. In this case, two type 1s (office/paper) and a Type 3 (discovery).**

**Example - Review Type 2 (Inspection/Field Review). Number of samples (or percent of total samples) to review must be established at the beginning of the period as described above. Enter the pre-determined sample size here and share this data with your contractor. Random locations should be selected when the QA review is performed. Process to randomly select QA locations is at District discretion. Location selection process should be openly shared with the contractor.**

---

**SECTION I - ASSET MAINTENANCE PERFORMANCE MEASURES**

**MOTORIST AD CALL BOXES (MACB) INSPECTIONS & MAINTENANCE**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MACB inspections performed no less than once every 45 days.</td>
<td>PERFORMANCE MET</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MACB deficiencies from inspection report affecting system operation corrected within 48 hours &amp; others corrected within 15 work days.</td>
<td>NOT IN CONTRACT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>MACB that have been knocked down repaired or replaced within 3 working days.</td>
<td>PERFORMANCE MET DOES NOT MEET</td>
<td>NOT IN CONTRACT</td>
<td></td>
</tr>
</tbody>
</table>

**HIGHWAY LIGHTING OPERATIONS**

<p>| | | | | |</p>
<table>
<thead>
<tr>
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</tbody>
</table>

**ATTENUATOR INSPECTIONS & MAINTENANCE**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Attenuator inspections performed within the last year (no delinquent inspections).</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

100% of Attenuator deficiencies noted on the inspection report corrected within 30 days of identification.

Attenuator deficiencies from incidents corrected/repair within 5 days from the time of identification.

**SIGN INSPECTIONS & MAINTENANCE**

<p>| | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ground Sign inspections performed within last 2 years (no delinquent inspections).

100% of Ground Sign deficiencies from 2 year inspection report corrected within 30 days of identification.

Correct deficiencies from incidents.
The Districts has the option of developing criteria requirements and compliance indicators for seven (or fewer) areas that they think are necessary for their AM Contract. The District will also specifying a required Review Type using a drop-down box. These user-defined compliance indicators must be approved by the Office of Maintenance before use on your AMPER.

<table>
<thead>
<tr>
<th>CONTRACTUAL REQUIREMENTS SPECIFIC TO THIS PROJECT</th>
<th>NOT IN CONTRACT</th>
<th>NOT IN CONTRACT</th>
<th>NOT IN CONTRACT</th>
<th>NOT IN CONTRACT</th>
<th>NOT IN CONTRACT</th>
<th>NOT IN CONTRACT</th>
<th>NOT IN CONTRACT</th>
</tr>
</thead>
</table>

For Type 1 & 3 reviews, the user should (but not required to) merge these two cells together to match the format of the rest of the AMPER.

Delete (make them blank) the default “Not in Contract” evaluations for each row where you enter a user-defined performance criteria. When you fill out your 6-month AMPER evaluation, you will select the appropriate result from the drop-down list just as you do all the other performance measures.

Enter specific, measurable performance criteria here. The criteria must be based on contract document requirements.
This column is for the AM Project Manager to state facts/document actions taken during this 6-month Evaluation period. Since this Section V is subjective, you are encouraged to provide plenty of supportive notes & comments.

### Scoring range for AM Project Manager to score the AM Contractor.
The AM Contractor may receive a score anywhere from 4 - 10 points. Half points are ok.

<table>
<thead>
<tr>
<th>Contractor interaction with the public and other customers was excellent.</th>
<th>Score Range 9 - 10 Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Contractor satisfactorily interacted with the public and other customers.</td>
<td>Score Range 7 - 8 Points</td>
</tr>
<tr>
<td>The Contractor had difficulty interacting with the public and other customers.</td>
<td>Score Range 5 - 6 Points</td>
</tr>
<tr>
<td>The Contractor had significant difficulty interacting with the public and other customers.</td>
<td>Score Range 4 Points</td>
</tr>
</tbody>
</table>

Score entered by the AM Project Manager based on the range shown that the AM Contractor performance. This score may be selected from the drop-down box or simply typed in.
Appendix E

Supplemental Documents

Main Roads of Western Australia (MRWA)

Exhibits E.1 thru E.3
All used with permission by Robert Barnsley
Exhibit E.1

MRWA: Innovative Term Structure & Examples

The term structure of the ISA agreement was developed to promote long term relations with service providers. It also encourages contractors to make-up for a “off” or “bad” year of performance. These documents were taken from Part B of the Pilbara RFP document.

Reference:
7 Performance Evaluation Group

7.1 Establishment and responsibilities

(a) Main Roads has established the Performance Evaluation Group.

(b) The primary function of the Performance Evaluation Group is to:

(1) independently evaluate the ISA Parties’ self-assessments of their performance prepared under this Agreement; and

(2) prepare Performance Assessment reports for the consideration of the ISA Governance Team and Main Roads in accordance with the Performance Assessment Framework set out in Schedule 5.

(c) The roles and responsibilities of the Performance Evaluation Group are more fully described in Schedule 1.

7.2 Representation

(a) The representatives of the Performance Evaluation Group must not be members of the ISA Governance Team or ISA Management Team or otherwise have any involvement in this Agreement.

(b) The representatives initially appointed by Main Roads are set out in Schedule 1.

(c) The representatives of the Performance Evaluation Group may be removed or replaced by Main Roads from time to time.

7.3 Chairperson

Main Roads may appoint a member of its personnel as the chairperson of the Performance Evaluation Group. Main Roads has initially appointed [insert] as the chairperson of the Performance Evaluation Group. Main Roads may, from time to time, change the chairperson by giving notice in writing to the ISP.

8 Term

8.1 Term

Subject to clause 32.14, this Agreement commences on the Commencement Date and continues until the earlier of:

(a) the expiry of the Term; and

(b) the date this Agreement is terminated in accordance with its terms (including if terminated in accordance with clause 24).

8.2 Extension to the Term

(a) If the ISA Parties receive a Positive Assessment under the Performance Assessment Framework, then the Term is extended as at the Performance Assessment Date of that Performance Assessment by 1 year.

(b) Subject to clause 8.2(e), if the ISA Parties receive a Negative Assessment under the Performance Assessment Framework, then the Term remains unchanged and the Lost

Drafting Note – Main Roads is to advise as to the identity of the chairperson prior to entry into the ISA Agreement.
Years Figure is increased as at the Performance Assessment Date of that Performance Assessment by 1.

(c) If the ISA Parties receive an Outstanding Assessment under the Performance Assessment Framework, then, as at the Performance Assessment Date of that Performance Assessment:

1. the Term is extended by 1 year; and
2. if the Lost Years Figure on the day immediately prior to that Performance Assessment Date is greater than 0, then:
   
   A. the Lost Years Figure is reduced by 1; and
   
   B. the Term is further extended by 1 year.

(d) Without limiting clauses 8.2(a), if the ISA Parties achieve a Positive Performance Trend under the Performance Assessment Framework, and the Lost Years Figure as at the date of the Performance Assessment Date of the last Performance Assessment relating to that Positive Performance Trend is greater than 0, then:

1. the Lost Years Figure is reduced by 1; and
2. the Term is extended by 1 year.

(e) If, at any time during the Term, the Lost Years Figure on the day immediately prior to a Performance Assessment Date is 2 and the ISA Parties receive a Negative Assessment under the Performance Assessment Framework on that next Performance Assessment Date, Main Roads will give the ISP a written notice of termination which states the date on which the Term will expire and this Agreement will terminate (which date must be no less than 12 months from the date of the notice of termination), in which case:

1. the Term will expire and this Agreement will terminate on the date stated in the notice of termination given by Main Roads to the ISP under this clause 8.2(e); and
2. clause 26 will apply.

(f) The Parties acknowledge and agree:

1. if the Term or Lost Years Figure is amended in accordance with this clause 8.2, then the amended Term or amended Lost Years Figure (as applicable) becomes the Term or Lost Years Figure for the purposes of this Agreement; and
2. multiple amendments to the Term or Lost Years Figure arising out of a Performance Assessment under this clause 8.2 are cumulative.

(g) To give effect to this clause 8.2 and subject to clause 8.2(e), by no later than 5 Business Days after a Performance Assessment Date, Main Roads must deliver a notice to the ISA Parties which specifies the revised Term and Lost Years Figure as at the Performance Assessment Date.

### 8.3 Termination in circumstances of Negative Performance Trend

If the ISA Parties achieve a Negative Performance Trend under the Performance Assessment Framework, then Main Roads may elect to terminate this Agreement by giving the ISP a written notice of termination and clause 26 will apply.

### 8.4 Worked examples of Term arrangements

(a) Schedule 13 sets out worked examples of the Term arrangements under this clause 8.

(b) If there is any ambiguity, discrepancy or inconsistency in or between this clause 8 and the worked examples of the Term arrangements set out in Schedule 13, then:

1. the ISA Parties must notify Main Roads of this in writing; and
Worked examples of Term arrangements

**Worked Example 1 – Positive and Negatives Assessments (but not Positive or Negative Performance Trends)**

This worked example reflects a combination of Positive and Negative Assessments (but with no Positive or Negative Performance Trends occurring).

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Assessment</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td><strong>Length of Term (years) from Commencement Date</strong></td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>7 (LYF1)</td>
<td>8 (LYF1)</td>
<td>9 (LYF1)</td>
<td>9 (LYF2)</td>
<td>10 (LYF2)</td>
<td>11 (LYF2)</td>
<td>11 (Main Roads gives notice of termination of not less than 12 months)</td>
<td>11 + remaining period of notice of termination</td>
</tr>
<tr>
<td><strong>Balance of Term (years) remaining following end of Year</strong></td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>Remaining period of notice of termination</td>
<td>N/A</td>
</tr>
</tbody>
</table>
This worked example shows the effect of Positive Performance Trends (i.e. 3 consecutive Positive Assessments).

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Assessment</td>
<td>N/A</td>
<td>N/A</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td></td>
</tr>
<tr>
<td>Length of Term (years) from Commencement Date</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>7 (LYF1)</td>
<td>8 (LYF1)</td>
<td>9 (LYF1)</td>
<td>+1 for Positive and LYF&gt;1 so +1 for PPT resulting in 11 (LYF0)</td>
<td>12 (LYF0)</td>
<td>13 (LYF0)</td>
<td>14 (LYF0 so nothing further for PPT)</td>
<td>15 (LYF0)</td>
<td>16 (LYF0)</td>
<td>17 (LYF0 so nothing further for PPT)</td>
</tr>
<tr>
<td>Balance of Term (years) remaining following end of Year</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>
Worked Example 3 – Negative Performance Trend

This worked example shows the effect of a Negative Performance Trend (NPT) (i.e. 2 out of 3 Negative Assessments).

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
</tr>
</thead>
<tbody>
<tr>
<td>Performance Assessment</td>
<td>N/A</td>
<td>N/A</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Negative</td>
</tr>
<tr>
<td>Length of Term (years) from Commencement Date</td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>7 (LYF1)</td>
<td>8 (LYF1)</td>
<td>9 (LYF1)</td>
<td>+1 for Positive and LYF&gt;1 so +1 for PPT resulting in 11 (LYF0)</td>
<td>11 (LYF1)</td>
<td>12 (LYF1)</td>
<td>12 (NPT so Main Roads may terminate)</td>
</tr>
<tr>
<td>Balance of Term (years) remaining following end of Year</td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
</tbody>
</table>
Worked Example 4 – Outstanding Assessments

This worked example shows the effect of Outstanding Assessments under the Performance Assessment Framework.

<table>
<thead>
<tr>
<th>Year</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance Assessment</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Positive</td>
<td>Positive</td>
<td>Negative</td>
<td>Outstanding</td>
<td>Positive</td>
<td>Positive</td>
<td>Outstanding</td>
</tr>
<tr>
<td><strong>Length of Term (years) from Commencement Date</strong></td>
<td>5</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>7 (LYF1)</td>
<td>8 (LYF1)</td>
<td>9 (LYF1)</td>
<td>9 (LYF2)</td>
<td>+1 and LYF&gt;1 so +1 for Outstanding resulting in 11 (LYF1)</td>
<td>12 (LYF1)</td>
<td>13 (LYF1)</td>
<td>+1 and LYF&gt;1 so +1 for Outstanding resulting in 15 (LYF0)</td>
</tr>
<tr>
<td><strong>Balance of Term (years) remaining following end of Year</strong></td>
<td>4</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>


Exhibit E.2

MRWA: Functional Description Tables (FDT’s)

These FDTs were provided in the ISA – Pilbara contract. The RFP was sent on a CD to the CHAMPS lab on the Virginia Tech campus. The full RFP CD with all documents is included with this final report package which was delivered to VDOT maintenance. The RFP (3 part) contains a full Interim ISA agreement. The Interim ISA agreement is used for evaluating work relationships with potential contractors and establishing project guidelines prior to start-up.

Reference:

<table>
<thead>
<tr>
<th>Pilbara Integrated Services Arrangement (ISA)</th>
<th>Main Roads Functions / Activities</th>
<th>Integrated Services Provider (ISP) Functions / Activities</th>
<th>In Collaboration or by Exception</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Road Network Operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1 Policy and Planning - develop, manage and maintain policy and plans for road network operations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.1 Strategic policy and planning</td>
<td>Develop and maintain strategic policies and plans for road network operations:</td>
<td>Develop and maintain a tactical and operational Network Operations Plan</td>
<td>(In collaboration) Identify opportunities to integrate activities with other ISAs</td>
</tr>
<tr>
<td></td>
<td>- Develop and maintain a tactical and operational Network Operations Plan</td>
<td>- Determine options and solutions to meet identified needs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Review and assess traffic studies associated with development</td>
<td>- Provide input / comment on regional and local structure plans</td>
<td></td>
</tr>
<tr>
<td>1.1.2 Stakeholder liaison</td>
<td>Identify with Local Government and other key stakeholders gaps and deficiencies in network performance and customer needs. Liaison with State and Local Government on development and planning issues</td>
<td>Monitor road signage and road markings (regulatory, advertising, illegal) to help ensure compliance with Main Roads’ policy.</td>
<td></td>
</tr>
<tr>
<td>1.1.3 Network access</td>
<td>Manage network access:</td>
<td>Monitor network access issues:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Assess subdivisional and development applications</td>
<td>- New access (driveways, temporary access etc), illegal accesses</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Assess mining and development applications</td>
<td>- ‘Hot spots’ e.g. crash sites, complaints from members of the public, issues raised through ministerial correspondence etc</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Assess utility providers requests for works in road reserve</td>
<td>- Inspect new access works for compliance with standards new conditions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Advice and comment on proposed subdivisional and development applications</td>
<td>- Impact of CL on existing network (structures and roads)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Manage access to the network in accordance with statutory requirements e.g. dedication, closure and control of access to / of road reserves</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Assess heavy haulage route applications, particularly Concessional Loading (CL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.1.4 Systems and processes</td>
<td>Data collection and analysis</td>
<td>(In collaboration) Develop, maintain and improve traffic, road safety and roadside environment processes and systems</td>
<td></td>
</tr>
<tr>
<td>1.2 Network Monitoring and Traffic Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.1 Traffic management planning</td>
<td>Assist the development of Traffic Management Plans for temporary works</td>
<td>Develop and / or review Traffic Management Plans for temporary works</td>
<td></td>
</tr>
<tr>
<td>1.2.2 Design of traffic sign and pavement marking</td>
<td>Review and approve Local Government and developer submissions for design and installation of pavement markings, signs and traffic signals</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.2.3 Site assessments</td>
<td>Conduct on-site assessments and evaluations and manage data collection</td>
<td>Assist assessment, evaluation and data collection</td>
<td></td>
</tr>
<tr>
<td>1.2.4 Technical advice</td>
<td>Provide technical advice on traffic related matters on State and local roads</td>
<td>Assist with provision of technical advice</td>
<td></td>
</tr>
<tr>
<td>1.2.5 Crash investigation</td>
<td>Fatal crash investigations and preliminary reporting</td>
<td>Assist fatal crash investigations</td>
<td></td>
</tr>
<tr>
<td>1.2.6 Speed zoning</td>
<td>Assess / process Speed Zoning proposals</td>
<td>Assist in the assessment / processing of Speed Zoning proposals</td>
<td></td>
</tr>
<tr>
<td>1.2.7 Road safety audits</td>
<td>Conduct road safety audits</td>
<td>Assist in road safety audits</td>
<td></td>
</tr>
<tr>
<td>1.2.8 Temporary road condition change</td>
<td>Manage (minimise) the impact of any temporary road condition change</td>
<td></td>
<td></td>
</tr>
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<td>1.2.9 Network performance</td>
<td>Monitor network performance and assist with analysis and assessment of network performance as required</td>
<td>Assist in the capturing of road and structural data</td>
<td>(In collaboration) Consider implications of network performance data</td>
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<td>Undertake incident risk assessments and develop contingency plans, as applicable, for known incident risks e.g. flooding incident management and emergency response</td>
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<td>Attend District and Local Emergency Management Committee (DEMCo, LEMCo) meetings and de-brief sessions as required, conduct high level liaison with Police, Fire &amp; Emergency Services Authority (FESA) and other emergency entities</td>
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<td>Develop and manage public information and community relations services including co-ordinating Main Roads’ involvement in community events</td>
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### Integrated Services Provider (ISP) Functions / Activities

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### In Collaboration or by Exception

- Assist in on-site inspections and the removal of illegal signs in accordance with Main Roads policy / intervention standards |
- Monitor road signage (e.g. regulatory, advertising, illegal) to help ensure compliance with Main Roads policy |
- Assist in the development and implementation of response and management plans for special events on or affecting the road network |
- On-site inspections and compliance checks |
- Assist in the implementation and execution of incident management |
- Attend as required |
- Provide incident / emergency response services as advised including: |
  - Erection of temporary traffic management signage |
  - Provision of traffic controllers |
  - Keeping Main Roads (i.e. regional staff / Customer Contact Centre) updated with real time information |
  - If applicable, document damage to Main Roads assets |
  - Liaison with emergency services personnel and police where required |
  - Undertake urgent repairs to assets |
- (In collaboration) Provision of on-scene control for traffic management and asset recovery |
- Provide the following services: |
  - Assist with assessment of heavy haulage route applications, including Concessional Loadings |
  - Monitor structures, roadside furniture and the crossing of extreme heavy loads |
- Attend stakeholder meetings as required |
- Assist by collecting / providing road condition data for real time traffic reporting |
- Assist in the provision of information and through participation in these activities |
- Collaborate with Main Roads and stakeholders in providing effective community and media engagement |
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<td>1.6.1.4</td>
<td>Manage the collection, interpretation and application of customer feedback to improve customer services</td>
<td>Collaborate and participate in identifying initiatives to improve customer services from feedback</td>
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<td>Develop, maintain and improve customer service processes and systems</td>
<td>Participate in process improvements</td>
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<td>1.6.2</td>
<td>Manage the road reporting system: Provide traveller and incident information Co-ordinate uploading of Road Condition Reports Manage distribution of information via media services</td>
<td>Provide the following services: Support for real time traveller information Assist with the provision of road condition data to ensure report accuracy</td>
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<td>1.6.3</td>
<td>Receive and manage customer enquiries and complaints (e.g. ministerial enquiries, media enquiries, providing comment on transport / road related community issues etc)</td>
<td>Provide advice for response and / or respond to enquiry e.g. repair the defect.</td>
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### Operational Asset Management - Planning

| 2.1 Asset Management Planning - developing and maintaining asset management plans to achieve the best asset life cycle investment decisions | Long term asset management planning: Develop solutions, options and priorities for input to the Regional Network Plan, Asset Link Plan and Corridor Plan Develop, maintain and monitor the Regional Network Plan, Asset Link Plan and Corridor Plan Develop, maintain and monitor the Road Asset Planning Information Database (RAPID) | Provide assistance to: Prepare planning estimates, business cases / justifications (including Benefit Cost Ratios (BCRs) and project concepts as required Provide input into development of the Regional Network Plan, Asset Link Plan and Corridor Plan as required Assist with input analysis and data provision (e.g. traffic data, crash data) | (By exception) Commission and manage consultants for the provision of specialist services (In collaboration) assistance with input analysis and/or associated development of long term asset management plans |

| 2.1.1 Regional Network Plan, Asset Link Plan and Corridor Plan | Stakeholder consultation and liaison Consultation and liaison with key stakeholders e.g. internal stakeholders such as infrastructure Delivery Directorate, State and Local Government, service / utility authorities, land owners and road users on planning matters and asset management plans, programs and interventions | Participate in consultation and liaison with key stakeholders |  |

| 2.1.1.1 Stakeholder consultation and liaison | Develop, manage, and monitor the 10 Year Network Program e.g. maintenance (routine, periodic / preventative, rehabilitation), improvement and expansion programs: Preparation of budget submissions Reconciliation to indicative budgets Preparation of program amendments Preparation of financial reports | Provide assistance via collection, collation and management of inspection data, maintenance data, investigation, plus ideas and suggestions for treatment design / selection | (By exception) Provision of pavement modelling services (By exception) Use the services available under the Engineering & Technical Services (ETS) and / or Bridge Design Services (BDS) Common Use Contract (CUC) arrangements |

<p>| 2.1.2 10 Year Network Program - roads | Identify gaps and deficiencies, develop solutions / options and priorities to optimise the performance of the network consistent with specified levels of service, intervention standards, environmental standards, product standards and customer needs: Develop solutions from the Regional Network Plan, Asset Link Plan and Corridor Plan for input to the 10 Year Network Program Develop and manage road improvement and expansion strategies Develop and manage maintenance agreements Develop and manage road routine and periodic maintenance and rehabilitation strategies and programs Identify, develop and manage road safety programs (short term / low cost solutions &lt; $3M) (e.g. Blackspot Program) Consultation with key stakeholders Prepare concept plans Prepare master plans Prepare cost estimates Prepare briefings / fact sheets Submit schedules and reports as required | Assist in the preparation of plans, mapping, development of processes, project investigation, concepts and business cases as required: Investigate options / undertake feasibility studies Concept plans Master plans Business cases and project charters / Project Proposal Reports Identify land requirements / arrange land acquisition Arrange environmental clearances Investigate services / utilities e.g. relocation Engage and manage consultants Arrange / prepare preliminary designs Arrange stakeholder / public consultation Project schedules and monthly progress reports Revegetation strategies | (By exception) Provision of pavement modelling services (By exception) Use the services available under the Engineering &amp; Technical Services (ETS) and / or Bridge Design Services (BDS) Common Use Contract (CUC) arrangements (By exception / specialist) Manage consultants for the provision of specialist services |</p>
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| 2.1.2.2 Asset Planning                      | • Prioritisation of gap / deficiency rectifications  
  • Review of asset inspection reports and treatment suggestions | Provide services to monitor and assess road assets. This includes:  
  • Asset inspections and reports  
  • Road inspection data and maintenance data  
  • Collection and management of data  
  • Investigation (including technical services, survey, materials investigation etc)  
  • Gap / deficiency identification  
  • Ideas and suggestions for treatment / design selection | (In collaboration) Review and evaluate the effectiveness of implemented options in addressing the identified gaps and deficiencies on the network  
   (By exception) Use the services available under the ETS and / or BDS CUC arrangements |
| 2.1.2.3 Program data management             | Manage and review the entry of data into corporate systems / program databases | Data entry into corporate systems / program databases | In collaboration |
| 2.1.3 Annual Works Program – roads (what, where, who, how) | Develop, manage, maintain and monitor the Annual Works Program for maintaining (routine, periodic / preventative, rehabilitation), improving and expanding the road network:  
  • Develop solutions, options and priorities from the 10 Year Network Program for input to the Annual Works Program  
  • Prepare budget submissions  
  • Reconciliation to indicative budgets  
  • Undertake financial management as required  
  • Prepare a detailed 12 month works program  
  • Undertake a risk assessment of the 12 month works program | Contribute to the development of the Annual Works Program:  
  • Asset inspections and reports  
  • Scope of Works  
  • Costing  
  • Prioritisation  
  • Scheduling  
  • Resources  
  • Method of delivery  
  • Risk assessment | (By exception) Use the services available under the ETS and / or BDS CUC arrangements |
| 2.1.3.1 Technical standards and treatment selection | Responsible for technical standards, treatment selection and approval | Provide assistance via collection, collation and management of inspection data, maintenance data, investigation, plus ideas and suggestions for treatment / design selection | Contribute to the development, maintenance and improvement of asset planning, management processes and systems |
| 2.1.3.2 Road reserve                         | Manage the road reserve clear zone including scoping and specification of maintenance to vegetation | Monitor and report on the road reserve clear zone |
| 2.1.3.3 Environment                         | Manage environmental conditions and compliance | Monitor environmental conditions and compliance |
| 2.1.3.4 Materials                           | Manage materials laboratory / services (and materials specifications in conjunction with Materials Engineering Branch) | Provide pavement and / or materials testing and / or advice as required | (In collaboration) Plan, manage and undertake materials search and testing (e.g. gravel) |
| 2.1.4 10 Year Network Program - structures  | Development, manage, maintain and monitor the 10 Year Network Program for structures e.g. maintenance (routine, periodic / preventative, rehabilitation), improvement and expansion programs:  
  • Preparation of budget submissions  
  • Reconciliation to indicative budgets  
  • Preparation of program amendments  
  • Preparation of financial reports | Provide services for annual visual structures inspection | (In collaboration) Review and evaluate the effectiveness of implemented options in addressing the identified gaps and deficiencies on the network  
   (By exception / specialist) Manage consultants for the provision of specialist services  
   (By exception) Use the services available under the ETS and / or BDS CUC arrangements |
| 2.1.4.1 Program development                 | Identify gaps and deficiencies, and in collaboration with Structures Branch develop solutions / options and priorities to optimise the performance of network structures consistent with specified levels of service, intervention standards, environmental standards, product standards and customer needs:  
  • Develop solutions from the Regional Network Plan, Asset Link Plan and Corridor Plan for input to the 10 Year Network Program | Provide assistance via collection, collation and management of inspection data, maintenance data, investigation, plus ideas and suggestions for treatment / design selection | (By exception) Use the services available under the ETS and / or BDS CUC arrangements |
<p>| 2.1.4.2 Program data management             | Manage and review the entry of data into corporate systems / program databases | Data entry into corporate systems / program databases | In collaboration |
| 2.1.4.3 Load rating                         | Manage load rating of structures in conjunction with Structures Branch | Provide routine visual inspections and information | Provide assistance to Structures Branch for load rating and other specific inspection works |</p>
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| 2.1.5 Annual Works Program - structures (what, when, who, how) | Develop, manage, maintain and monitor the Annual Works Program for maintaining routine, periodic / preventative, rehabilitation, improving and expanding structural assets:  
  - Develop solutions, options and priorities from the 10 Year Network Program for input to the Annual Works Program  
  - Prepare budget submissions  
  - Reconciliation to indicative budgets  
  - Undertake financial management as required  
  - Prepare a detailed 12 month works program  
  - Undertake a risk assessment of the 12 month works program | Contribute to the development of the Annual Works Program:  
  - Asset inspections and reports  
  - Scope of Works  
  - Costing  
  - Prioritisation  
  - Scheduling  
  - Resources  
  - Method of delivery  
  - Risk assessment | (In collaboration) Review and evaluate the effectiveness of implemented options in addressing the identified gaps and deficiencies on the network  
  (By exception / specialist) Manage consultants for the provision of specialist services  
  (By exception) Use the services available under the ETS and / or BDS CUC arrangements |
| 2.1.5.1 Technical standards and treatment selection | Responsible for technical standards, treatment selection and approval | Provide assistance via collection, collation and management of inspection data, maintenance data, investigation, plus ideas and suggestions for treatment/design selection | (In collaboration) Review and evaluate the effectiveness of implemented options in addressing the identified gaps and deficiencies on the network |
| 2.2 Local Roads Program | Develop and manage the Local Roads Program for:  
  - Road Project Grants  
  - Direct Grants  
  - Blackspot Program | | |
| 2.2.1 Develop and maintain the Local Roads Program | Tasks include:  
  - Preparation of budget submissions  
  - Reconciliation to indicative budgets  
  - Management and recording of submissions  
  - Undertaking audits of Local Government submissions for:  
    - Road Project Grants (for rehabilitation and improvement projects)  
    - Local Roads Blackspot Program  
    - Liaison with Local Governments on asset management issues, future maintenance agreements arising from projects, responsibility plans | | (By exception) ISP to assist with tasks as required |
| 2.2.2 Regional Road Groups | Co-ordination of the activities of the Regional Road Groups (RRGs):  
  - Organisation and facilitation of RRG meetings  
  - Liaison with RRG members | | |
| 3 Operational Asset Management - Other | | | |
| 3.1 Asset Data Management - management of data for business and asset management purposes | | | |
| 3.1.1 Systems and data | Manage, maintain, monitor and assess corporate and other systems and data (excluding structural data) e.g. Integrated Road Inventory System (IRIS), Maintenance Management Information Systems (MMIS):  
  - Road condition data  
  - Inventory data  
  - Survey data  
  - Maintenance data  
  - Road use data | Provide services for:  
  - Capture of relevant data e.g. inspections, activities, defects (MMIS)  
  - Data entry to Main Roads’ corporate systems (e.g. IRIS)  
  - Co-ordination of IRIS updates  
  - Assisting the provision and development of improved asset databases and management systems | (By exception / specialist) Commission and manage consultants for the provision of specialist services |
<p>| 3.1.2 Stand alone databases | Manage, maintain, monitor and assess corporate data in stand alone databases | | (By exception / Main Roads’ Structures Branch) Manage the analysis of structures data |
| 3.1.3 Modelling | Develop asset modelling tools and techniques | | (By exception) Undertake traffic and other modelling as required |</p>
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| 3.2 “Works by Others” (e.g., utilities, local government, sub-division and development access) – technical and policy advice, application of standards, supervision etc | Manage “Works by Others” within Main Roads’ road reserve:  
- Assess access applications  
- Arrange design reviews  
- Review traffic management plans  
- Prepare Utility Services Management Agreements  
- Investigate unauthorised works on the network  
- Arrangements for accommodation works | Provide services to:  
- Assist the assessment of applications of ‘Works by Others’  
- Monitor ‘Works by Others’ e.g. surveillance, inspection, monitoring, reports  
- Investigation of unauthorised works  
- Assess impact of proposed traffic management arrangements | In Collaboration or by Exception:  
(In collaboration) Develop specific work guidelines, processes, practices and task instructions for application in the Pilbara Region. |
| 3.3 Policy / Process / Practice  
- developing, managing and improving policies, systems processes and practices | Development  
Contribute to the development and management of corporate asset management policies, systems, processes and practices | (In collaboration) Develop specific work guidelines, processes, practices and task instructions for application in the Pilbara Region. | |
| 3.3.1 Development | Manage and monitor compliance with corporate asset management policies, systems, processes and practices and statutory requirements | (In collaboration) Develop specific work guidelines, processes, practices and task instructions for application in the Pilbara Region. | |
| 3.3.2 Compliance | Provide technical advice to others e.g. Local Government | (In collaboration) Seek to optimise the use of local industry (sub contractors) and / or Local Government to provide services. | |
| 3.3.3 Technical advice | | | |
| 4 Maintenance Delivery | | | |
| 4.1 Routine Maintenance (unplanned maintenance) - maintenance of emergent defects for roads and structures | Responsible for technical standards and routine maintenance practices | Manage and / or provide the resources (workforce, plant and equipment) to deliver routine (unplanned) maintenance for roads and structures:  
- Maintenance scheduling and planning  
- Routine (visual) inspection services  
- Providing / managing resources to undertake services  
- Maintenance delivery (works) | (In collaboration) Seek to optimise the use of local industry (sub contractors) and / or Local Government to provide services. |
| 4.2 Periodic Maintenance, Rehabilitation and Resurfacing (predicted / planned maintenance) - roads - address faults, defects and cyclic maintenance activities | | | |
| 4.2.1 Delivery programs and methods | Manage the development of delivery programs and methods | | |
| 4.2.2 Treatment | Responsible for technical standards, treatment selection and approval  
Manage materials laboratory / services (and materials specifications in conjunction with Materials Engineering Branch) | Assist development of delivery programs and methods  
Manage and / or provide the resources (workforce, plant and equipment) to deliver periodic / specific maintenance for roads e.g. rehabilitation, resurfacing, edge repairs, shoulder grading, shoulder reconditioning, pavement repairs, verge slashing, vegetation clearance, crack patching, drainage works, replacing signs etc:  
- Scheduling and planning  
- Technical services (e.g. geotechnical investigation)  
- Undertake surveys  
- Manage resources to undertake services  
- Maintenance delivery (works) | (In collaboration) Prepare / plan line-marking program.  
(In collaboration) Seek to optimise the use of local industry (sub contractors) and / or Local Government to provide services.  
(By exception) Deliver longitudinal line-marking services via CUC arrangements. |
| 4.3 Periodic Maintenance and Rehabilitation (predicted / planned maintenance) - structures - address faults, defects and cyclic maintenance activities | Manage the development of delivery programs and methods  
Responsible for technical standards, treatment selection and approval | Assist development of delivery programs and methods  
Manage and / or provide preventative maintenance and specific maintenance works:  
- Scheduling and planning  
- Technical services  
Provide non-structural services for structures e.g. vegetation control, surveys, monitoring etc. | (In collaboration) Plan, manage and undertake materials search and testing e.g. gravel. |
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<th>4.4</th>
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<td>Responsible for technical standards, treatment selection and approval</td>
<td>Manage and / or provide and / or procure the resources (e.g. workforce, plant and equipment) to deliver reconstruction and surfacing services:</td>
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<td>Manage materials laboratory / services (and materials specifications in conjunction with Materials Engineering Branch)</td>
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<td>● Manage resources to undertake works and / or assist works delivery</td>
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<td>(In collaboration) The ISA will arrange the resources (workforce, plant and equipment) to deliver rehabilitation services for roads and structures</td>
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<td>(By exception / specialist) Commission and manage consultants for the provision of specialist services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(In collaboration) Plan, manage and undertake materials search and testing (e.g. gravel)</td>
</tr>
</tbody>
</table>

| 4.5 | Routine Maintenance (unplanned maintenance) - electrical assets including ITS - maintenance of non-complex defects | Responsible for technical standards | Manage and / or provide the resources (e.g. workforce, plant and equipment) to deliver routine (unplanned) maintenance as required for non-complex defects in electrical assets (as agreed / determined with the Metropolitan ISA or other electrical asset service provider). Proposed involvement include the following functions: |
|     |                                                               |                                                          | ● Provide routine (visual) inspection services |
|     |                                                               |                                                          | ● Assist scheduling and planning |
|     |                                                               |                                                          | ● Manage resources to undertake services |
|     |                                                               |                                                          | ● Undertake non-complex works |
|     |                                                               |                                                          | Note: TCIC contract responsible for rectification of all faults until 2012 |
|     |                                                               |                                                          | (By exception) The Metropolitan ISA (or separate service provider) will provide services if the defect is found to be complex / cannot be fixed locally e.g. by ISP or local electrical contractor |

<p>| 4.6 | Periodic Maintenance (predicted / planned maintenance) - electrical assets including ITS - address faults, defects and cyclic maintenance activities | | | | | The Metropolitan ISA (or separate service provider) will provide this service |</p>
<table>
<thead>
<tr>
<th>Pilbara Integrated Services Arrangement (ISA)</th>
<th>Main Roads Functions / Activities</th>
<th>Integrated Services Provider (ISP) Functions / Activities</th>
<th>In Collaboration or by Exception</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 Capital Works Delivery (Minor Improvement Works)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1 Design and / or Deliver Road / Bridge Improvement Projects (&lt;$3.0M)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| 5.1.1 Delivery | Delivery of road and structures / bridge improvement projects | Provide project / contract design and / or delivery services to assist project / contract delivery:  
| Land Acquisition / Road Access Issues | Manage and / or provide the resources (e.g. workforce, plant and equipment, materials testing, survey etc) to deliver capital improvement projects relating to roads, intersections, structures / bridges  
| Managing enquiries and complaints | Provide resources as required to undertake the following in conjunction with Main Roads’ personnel:  
| Design and / or Deliver Road / Bridge Improvement Projects (<$3.0M) | Project Management  
| Design | Estimation  
| Design management | Document and contract preparation  
| Accommodation works | Liaison with landowners  
| Delivery management | Reporting  
| Closeout | Design  
| Preparation of design and documentation | Geotechnical, survey  
| Studies (e.g. dilapidation) | Preparation of ‘as constructed’ drawings  
| Design Review and Road Safety Auditing | Design review for all project designs  
| Road safety audit for significant projects | Services / Utilities  
| Assist with location and co-ordination of relocation of services | Traffic Management Plans  
| Preparation of traffic management plans | Compliance auditing of traffic management plans  
| Environment | Document / plan preparation  
| Clearing | Fauna / heritage / noise investigation and approvals  
| Preparation of environmental reports | Quantity Surveying  
| Cost estimation services | Preparation of Schedule of Rates / Bill of Quantities | (In collaboration) Develop delivery programs  
| (In collaboration) Identify project / contract management development opportunities for Main Roads and ISP personnel e.g. training / mentoring role  
| (In collaboration) Manage the interface between ‘Works by Others’ and ISA maintenance activities | Standards | Responsible for technical standards  
| Manage materials laboratory / services (and materials specifications in conjunction with Materials Engineering Branch) | Tendering | Manage public tendering process  
| Assistance with tendering tasks | (By exception) A proportion of the capital works program and / or services will be delivered by alternative arrangements, including the use of a public (competitive) tender process, Local Government / Local Government consortia and existing CUC arrangements |

MAIN ROADS Western Australia

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<table>
<thead>
<tr>
<th>6</th>
<th><strong>Project &amp; Contract Management Services</strong></th>
<th><strong>Main Roads Functions / Activities</strong></th>
<th><strong>Integrated Services Provider (ISP) Functions / Activities</strong></th>
<th><strong>In Collaboration or by Exception</strong></th>
</tr>
</thead>
</table>
| **6.1** | **Project & Contract Management** | Project management of Category 2 (Cat 2) capital works projects. This includes:  
Initiate / Define:  
- Feasibility studies  
- Develop project concepts and charters, business cases (RO&DS)  
Develop:  
- Prepare and manage designs / design review, investigations and studies  
- Prepare project plans e.g. schedules, tasks, activities, risk assessments etc  
- Prepare contract documentation  
- Community engagement  
- Land management e.g. acquisition, negotiations, drawings, resumptions, accommodation works etc  
Deliver / Implement:  
- Manage delivery e.g. works supervision, compliance, progress reports, forecasting, on-going community liaison etc  
Close-out:  
- Asset hand-over, commissioning, “as-constructed” drawings, IRIS update, project / contract review etc  
Maintain:  
- Operational asset management | Provide project management services to assist project delivery e.g. road and bridge design / design review services | (By exception) Improvement projects >$3.0M will be managed / awarded by separate arrangement e.g. public tender  
(In collaboration) Identify project management development opportunities for Main Roads and ISP personnel e.g. training / mentoring role  
(In collaboration) Manage the interface between ‘Works by Others’ and ISA maintenance activities  
(By exception) Use the services available under the ETS and / or BDS CUC arrangements |

| **6.2** | **Environmental Management** | Provide environmental services / project support by:  
- Undertaking ad hoc investigations / providing advice  
- Complete or review Low Impact Checklists  
- Engaging and managing consultants to carry out Environmental Impact Assessments / biological surveys / heritage assessments  
- Obtaining clearing permits  
- Preparing and submitting environmental Project Compliance Reports  
- Contributing to development of drainage strategy  
- Managing regional awareness of notified contaminated sites | Provide assistance for environmental tasks |  |

| **6.3** | **Project Review** | Review of preliminary project designs to minimise maintenance and post construction issues |  |  |

| **7** | **Business Management** |  |  |  |
| **7.1** | **Business Management** |  |  |  |
| **7.1.1** | **Business management** | Business management (e.g. finance, payments, HR, policies, standards, performance measurement and reporting, vehicles, plant, facilities management, accommodation, building maintenance etc) in relation to Main Roads’ corporate policies, personnel, systems, facilities and accommodation etc | ISP administration: management of the ISP’s policies, personnel, plant, equipment, systems and office / living accommodation | (In collaboration) Develop common policies to support the ISA business arrangement e.g. co-location, vehicle policy, system interfaces etc and role of the ISP Administrator |

| **7.1.2** | **Performance** | Performance Assessment Framework:  
- Develop, establish and review Key Performance Areas (KPAs)  
- Develop, establish and review Business Performance Indicators (BPIs)  
- Undertake regular self-assessments of performance | With Main Roads:  
- Develop, establish and review KPAs  
- Develop, establish and review BPIs  
- Undertake regular self-assessments of performance | (In collaboration) Monitor key performance areas and prepare self-assessed ISA performance reports |

| **7.1.3** | **Financial reporting** | Provide financial information to suit Main Roads’ corporate financial systems and processes |  |  |

| **7.1.4** | **Business planning** | Develop and manage regional business plans | Assist / contribute towards regional / ISA business planning and management |  |

<p>| <strong>7.2</strong> | <strong>Training &amp; Development</strong> | Develop and manage Main Roads’ staff development | Develop and manage ISP staff development | (In collaboration) Seek / undertake training and development as an integral component of delivery of services |</p>
<table>
<thead>
<tr>
<th></th>
<th>Pilbara Integrated Services Arrangement (ISA)</th>
<th>Main Roads Functions / Activities</th>
<th>Integrated Services Provider (ISP) Functions / Activities</th>
<th>In Collaboration or by Exception</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.3</td>
<td>Quality Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.3.1</td>
<td>Corporate system</td>
<td>Compliance with Main Roads’ 3rd Party certified Quality Management System (QMS) (where applicable / in place for various business functions)</td>
<td>Support compliance with Main Roads’ QMS</td>
<td>(In collaboration) Develop and manage an appropriate QMS Plan to integrate / comply with Main Roads’ corporate QMS</td>
</tr>
<tr>
<td>7.3.2</td>
<td>QMS Plan</td>
<td>Develop, maintain and improve the QMS Plan</td>
<td>Assist Main Roads to develop, maintain and improve the QMS Plan</td>
<td></td>
</tr>
<tr>
<td>7.4</td>
<td>Occupational Health &amp; Safety (OHS) Management</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.4.1</td>
<td>Corporate system</td>
<td>Compliance with Main Roads’ 3rd Party certified Occupational Health &amp; Safety Management System (OHSMS), where applicable</td>
<td>Support compliance with Main Roads’ OHSMS</td>
<td>(In collaboration) Develop and manage an appropriate OHS Plan to integrate / comply with Main Roads’ corporate OHSMS</td>
</tr>
<tr>
<td>7.4.2</td>
<td>OHS policy and practice</td>
<td>Develop and manage OHS policy and practice</td>
<td>Support OHS development and practice</td>
<td></td>
</tr>
<tr>
<td>7.4.3</td>
<td>OHS Plan</td>
<td>Develop, maintain and improve the OHS Plan</td>
<td>Assist Main Roads to develop, maintain and improve the OHS Plan</td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>Environmental Management (EM)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.5.1</td>
<td>Corporate system</td>
<td>Compliance with Main Roads’ 3rd Party certified Environmental Management System (EMS), where applicable</td>
<td>Supporting compliance with Main Roads’ EMS</td>
<td>(In collaboration) Develop and manage an appropriate EM Plan to integrate / comply with Main Roads’ corporate EMS</td>
</tr>
<tr>
<td>7.5.2</td>
<td>EM Plan</td>
<td>Develop, maintain and improve the EM Plan</td>
<td>Assist Main Roads to develop, maintain and improve the EM Plan</td>
<td></td>
</tr>
</tbody>
</table>
Exhibit E.3

MRWA: Routine Maintenance Intervention Parameters (RIMPs)

These RIMPs will be used on the ISA Pilbara Network for determining levels of service. E.3 was taken from Appendix 8 of the ISA Pilbara RFP: Part B.

Reference:

ANNEXURE 11A TO CONTRACT NO 2/99

ROAD MAINTENANCE INTERVENTION PARAMETERS

This Annexure comprises this cover page and the following thirty five pages.

Note: These Road Maintenance Intervention Parameters (RMIPs) are those that apply to the current Term Network Contracts in the Pilbara region.
# ANNEXURE 11A  ROAD MAINTENANCE INTERVENTION PARAMETERS

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ANNEXURE 11A.1 ROAD MAINTENANCE INTERVENTION PARAMETERS

1. DEFINITIONS

Definitions relating to the Road Maintenance Intervention Parameters are as defined in the Form of Contract. These definitions are repeated below.

“Defect”

means in respect of an Asset, any Condition which:

a) results in the Asset not being in good order and condition and fully effective and durable for its intended purpose; or

b) adversely affects safety, asset preservation, road user comfort or aesthetics.

“Repair”

means all action required to rectify a Defect.

“Repair Standard”

means the tolerance, finish and other requirements in respect of the Repair of an Asset, as specified in Annexure 15A (Repair Standards), or, if not specified, means in all respects in good order and condition and fully effective and durable for its intended purpose in every case consistent with other requirements of the Contract including in respect of safety, asset preservation, road user comfort and aesthetics.

“Road Maintenance Intervention Parameters”

is the collective title for the three related parameters “Maximum Intervention Level”, “Maximum Response Time” and “Maximum Defective Condition”.

“Maximum Intervention Level”

means the maximum severity of a Defect, at or before which remedial action must be taken to restore an Asset to the Repair Standard. If the rate of deterioration of an Asset cannot be predicted, the Maximum Intervention Level will be treated as not being exceeded if the Contractor rectifies the Defect prior to it exceeding:

(a) the applicable Maximum Response Time; and

(b) the applicable Maximum Defective Condition.

“Maximum Response Time”

applies in respect of Off-road Assets only if the rate of deterioration of an Asset cannot be predicted and remedial action cannot be taken prior to the Maximum Intervention Level for a Defect being exceeded, and means the maximum permissible period of time, commencing from the first to occur of the following events:

(a) in respect of Off-road Assets, the time of observation of the Defect by the Contractor;

(b) in respect of Off-road and On-road Assets, the time of notification of the Defect by the Principal; or

(c) in respect of Off-road Assets, the time of notification of the Defect by a member of the public or the Principal to the Contractor.
“Maximum Defective Condition”

applies only if the rate of deterioration of an Asset cannot be predicted and remedial action cannot be taken prior to the Maximum Intervention Level for a Defect being exceeded, and means the maximum permissible amount or quantity of a Defect in a condition worse than the Maximum Intervention Level that can be tolerated at any time.

2. APPLICATION OF ROAD MAINTENANCE INTERVENTION PARAMETERS

Where a Defect is hazardous to traffic the Contractor must immediately respond and address the safety hazard. The Contractor must first erect warning signs and then rectify the Defect within the appropriate response time as specified in Annexure 11A.

2.1 Off-road Assets

The Contractor must manage the Off-road Assets in accordance with the Road Maintenance Intervention Parameters.

The Contractor must undertake Asset inspections of the Off-road Assets at frequencies appropriate to the weather, traffic and other conditions current at the time. The Contractor must ensure that Asset inspections allow the condition of the Assets to be monitored such that the deterioration rate of an Asset can be predicted and remedial action scheduled and carried out prior to the Maximum Intervention Level being exceeded.

The Contractor acknowledges that some Defects can develop very rapidly or unexpectedly, such that they may not be detected and remedial action scheduled only after the Maximum Intervention Level has been exceeded. In such cases where the rate of deterioration of an Asset cannot be reasonably predicted, the Contractor must take reasonable precautions to prevent Maximum Intervention Levels for Defects being exceeded, and must ensure that the specified Maximum Defective Condition is not exceeded.

2.2 On-road Assets

The Superintendent will undertake inspections and schedule works for On-road Assets and will issue a Works Order pursuant to Clause 22.2 of the Form of Contract.

The Defects that will be scheduled by the Superintendent are shown in the following Road Maintenance Intervention Parameters table.

The response time for a Defect in an On-road Asset will commence from the time the Superintendent issues the Works Order relating to that Defect. The Contractor must rectify the Defects in accordance with the Works Order.

The Superintendent will, where appropriate, determine and specify a response time on the Works Orders. In determining the response time the Superintendent will consider both the Maximum Defective Condition and the Maximum Response Time shown in the following Road Maintenance Intervention Parameters table.

If the Superintendent considers that the extent of a Defect breaches the Maximum Defective Condition, or may breach the Maximum Defective Condition after issuance of a Works Order, the Superintendent may, where appropriate, establish an appropriate response time after consultation with the Contractor. The Contractor must rectify the Defect prior to the expiry of the response time specified in the Works Order. In the event of an agreement not being reached with the Contractor, with respect to an appropriate response time, a response time will not be specified in the Works Order and the Contractor must rectify the Defect prior to it exceeding either:

(a) the expiry of the applicable Maximum Response Time; or
(b) the Defect reaching the applicable Maximum Defective Condition.

3. TABLE OF ROAD MAINTENANCE INTERVENTION PARAMETERS

The Road Maintenance Intervention Parameters that apply for each road category within the Network are specified in the following table.

(Note: The term "Remote" is used in respect of Maximum Response Time for Emergency Response. For the purposes of determining Maximum Response Time for Emergency Response, "Remote" means a location situated outside a 200 km radius from a designated and functional townsite or community. The 200 km radius will not be measured from a townsite or community consisting of only a garage, roadhouse or general store.)
## ROAD MAINTENANCE INTERVENTION PARAMETERS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SEALED ROADWAY - including shoulders</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.1.1. 90 counts/km</td>
<td>6 months</td>
<td>100m in 10km</td>
<td></td>
</tr>
<tr>
<td>1.1</td>
<td>Roughness</td>
<td>M</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>1.1.2. 100 counts/km</td>
<td>6 months</td>
<td>200m in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>1.1.3. 110 counts/km</td>
<td>6 months</td>
<td>200m in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>1.1.4. 140 counts/km</td>
<td>6 months</td>
<td>200m in 10km</td>
<td></td>
</tr>
<tr>
<td>1.2</td>
<td>Rutting</td>
<td>Any</td>
<td>1.2.1. Any ponding of water hazardous to traffic</td>
<td>Before next rains</td>
<td>50m in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scheduled by Superintendent</td>
<td>M</td>
<td>1.2.2. 20 mm depth</td>
<td>3 months</td>
<td>100m in 10km</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A</td>
<td>1.2.3. 20 mm depth</td>
<td>6 months</td>
<td>200m in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B</td>
<td>1.2.4. 30 mm depth</td>
<td>6 months</td>
<td>200m in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>C</td>
<td>1.2.5. 30 mm depth</td>
<td>6 months</td>
<td>200m in 10km</td>
<td></td>
</tr>
<tr>
<td>1.3</td>
<td>Cracking</td>
<td>Any</td>
<td>1.3.1. Any block or crocodile cracking with fines pumping</td>
<td>6 months</td>
<td>5m2 in 10km</td>
<td>Repair prior to Winter / wet season</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scheduled by Superintendent</td>
<td>Any</td>
<td>1.3.2. Any moisture penetrating the pavement with potential for distress</td>
<td>6 months</td>
<td>5m2 in 10km</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.3.3. Any crocodile cracking in asphalt</td>
<td>6 months</td>
<td>10m2 in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.3.4. Any individual cracks &gt; 2mm width in aggregate seals</td>
<td>6 months</td>
<td>5m2 in 10km</td>
<td></td>
</tr>
<tr>
<td>1.4</td>
<td>Insufficient Surface Texture</td>
<td>Any</td>
<td>For asphalt surfacings 0.4 mm minimum for intersections and approaches, tight curves and steep grades</td>
<td>6 months</td>
<td>50m2 in 10km</td>
<td>Refer also to ‘1.18: Stripping’ and ‘1.19: Flushing’ defects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Scheduled by Superintendent</td>
<td>M</td>
<td>1.4.2. 0.2 mm minimum for other</td>
<td>6 months</td>
<td>50m2 in 10km</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For sprayed seal ≤ 70 km/hr speed limit 0.4 mm minimum for intersections and approaches, tight curves and steep grades</td>
<td>6 months</td>
<td>50m2 in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1.4.4. 0.2 mm minimum for other</td>
<td>6 months</td>
<td>50m2 in 10km</td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>DEFECT</td>
<td>ROAD CATEGORY</td>
<td>MAXIMUM INTERVENTION LEVEL</td>
<td>MAXIMUM RESPONSE TIME</td>
<td>MAXIMUM DEFECTIVE CONDITION</td>
<td>COMMENTS</td>
</tr>
<tr>
<td>------</td>
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<td>---------------</td>
<td>----------------------------</td>
<td>-----------------------</td>
<td>-----------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>1.4</td>
<td>Insufficient Surface Texture Scheduled by Superintendent</td>
<td>M</td>
<td>For sprayed seal &gt; 70 to ≤ 80 km/hr speed limit 1.4.6. 0.6 mm minimum for intersections and approaches, tight curves and steep grades 1.4.7. 0.8 mm minimum</td>
<td>6 months</td>
<td>50m² in 10km</td>
<td>Refer also to '1.18: Stripping' and '1.19: Flushing' defects</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A, B, C</td>
<td>For sprayed seal &lt; 70 km/hr speed limit 1.4.8. 0.4 mm minimum for intersections and approaches, tight curves and steep grades 1.4.9. 0.2 mm minimum for other</td>
<td>6 months</td>
<td>50m² in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For sprayed seal &gt; 70 to ≤ 80 km/hr speed limit 1.4.10. 0.6 mm minimum for intersections and approaches, tight curves and steep grades 1.4.11. 0.4 mm minimum for other</td>
<td>6 months</td>
<td>50m² in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>For sprayed seal &gt; 80 km/hr speed limit 1.4.12. 0.6 mm minimum</td>
<td>6 months</td>
<td>50m² in 10km</td>
<td></td>
</tr>
<tr>
<td>1.5</td>
<td>Insufficient Skid Resistance Scheduled by Superintendent</td>
<td>Any</td>
<td>1.5.1. 45 minimum British Pendulum Value for intersections and approaches, tight curves and steep grades 1.5.2. 40 minimum British Pendulum Value for other</td>
<td>6 months</td>
<td>1 site / Network</td>
<td></td>
</tr>
<tr>
<td>1.6</td>
<td>Patching Scheduled by Superintendent</td>
<td>Any</td>
<td>1.6.1. Patching Index &gt; 1</td>
<td>6 months</td>
<td>N/A</td>
<td>Refer to Annexure 11A.1.4. for Patching Index.</td>
</tr>
<tr>
<td>1.11</td>
<td>Pothole Scheduled by Superintendent</td>
<td>Freeway</td>
<td>1.11.1. Any pothole hazardous to traffic 1.11.2. Any pothole likely to deteriorate rapidly 1.11.3. Any pothole &gt; 50mm depth 1.11.4. Any other pothole</td>
<td>4 hours</td>
<td>1 per 10km</td>
<td>Rockbase basecourse is highly susceptible to rapid deterioration. Primerseals are often susceptible to rapid deterioration.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>M</td>
<td>1.11.5. Any pothole hazardous to traffic 1.11.6. Any pothole likely to deteriorate rapidly 1.11.7. Any pothole &gt; 50mm depth 1.11.8. Any other pothole</td>
<td>4 hours</td>
<td>1 per 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 day</td>
<td>2 per 10km</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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# ROAD MAINTENANCE INTERVENTION PARAMETERS

## Item 1.12

<table>
<thead>
<tr>
<th>Item</th>
<th>Defect</th>
<th>Road Category</th>
<th>Maximum Intervention Level</th>
<th>Maximum Response Time</th>
<th>Maximum Defective Condition</th>
<th>Comments</th>
</tr>
</thead>
</table>
| A    | 1.11.9. Any pothole hazardous to traffic  
1.11.10. Any pothole likely to deteriorate rapidly  
1.11.11. Any pothole > 50mm depth  
1.11.12. Any other pothole | Freeway | 4 hours | 1 per 10km |
| B    | 1.11.13. Any pothole hazardous to traffic  
1.11.14. Any pothole likely to deteriorate rapidly  
1.11.15. Any pothole > 50mm depth  
1.11.16. Any other pothole | Freeway | 1 day | 1 per 10km |
| C    | 1.11.17. Any pothole hazardous to traffic  
1.11.18. Any pothole likely to deteriorate rapidly  
1.11.19. Any pothole > 50mm depth  
1.11.20. Any pothole > 150mm diameter  
1.11.21. Any other pothole | Freeway | 1 day | 3 per 10km |

**Asphalt Delamination**  
Scheduled by Superintendent

1.12.1. Any delamination hazardous to traffic  
1.12.2. Any delamination > 30mm depth  
1.12.3. Any other delamination

| M    | 1.12.4. Any delamination hazardous to traffic  
1.12.5. Any delamination > 30mm depth  
1.12.6. Any other delamination | Freeway | 4 hours | 1 per 10km |
| A    | 1.12.7. Any delamination hazardous to traffic  
1.12.8. Any delamination > 30mm depth  
1.12.9. Any other delamination | Freeway | 1 day | 2 per 10km |
| B    | 1.12.10. Any delamination hazardous to traffic  
1.12.11. Any delamination > 30mm depth  
1.12.12. Any other delamination | Freeway | 4 days | 5 per 10km |
| C    | 1.12.13. Any delamination hazardous to traffic  
1.12.14. Any delamination > 30mm depth  
1.12.15. Any other delamination | Freeway | 1 week | 5 per 10km |

1.13 Isolated Depression  
Scheduled by Superintendent

| Any  | 1.13.1. 10mm abrupt (eg adjacent gully or manhole)  
1.13.2. Any ponding of water hazardous to traffic | Freeway | Before next rains | 1 per 10km |

| M    | 1.13.3. 30 mm depth | Freeway | 1 week | 2 per 10km |
| A    | 1.13.4. 40 mm depth | Freeway | 2 weeks | 5 per 10km |
| B    | 1.13.5. 40 mm depth | Freeway | 4 weeks | 5 per 10km |
| C    | 1.13.6. 40 mm depth | Freeway | 4 weeks | 5 per 10km |

Traffic includes adjacent bicycle and pedestrian traffic

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Contract 259 – Annexure 11A.doc  
Annexure 11A – Road Maintenance Intervention Parameters  
11/10/00  
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### Road Maintenance Intervention Parameters

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<thead>
<tr>
<th>Item</th>
<th>Defect</th>
<th>Scheduled by</th>
<th>Superintendent</th>
<th>Edge Break</th>
<th>Edge Drop off</th>
<th>Shipping (Loss of in excess of 50% seal, aggregate)</th>
<th>Superintendent</th>
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<tbody>
<tr>
<td>1.14</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
<td>Any</td>
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<tr>
<td>1.15</td>
<td>Showing</td>
<td>Scheduled by</td>
<td>Superintendent</td>
<td>Scheduled by</td>
<td>Scheduled by</td>
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<tr>
<th>Maximum Intervention Level</th>
<th>Maximum Defective Condition</th>
<th>Maximum Response Time</th>
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<tbody>
<tr>
<td>M</td>
<td>100 m in 10 km</td>
<td>1 week</td>
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<tr>
<td>B</td>
<td>100 m in 10 km</td>
<td>4 weeks</td>
</tr>
<tr>
<td>C</td>
<td>100 m in 10 km</td>
<td>6 weeks</td>
</tr>
</tbody>
</table>

**Measurement to include rut depth where combined with rutting.**

- **Treat prior to rains.**
- **Wet season or extreme high temperature.**
- **Refer also to **1.14 Insufficient Surface Strength.**

**Texture defect**
## ROAD MAINTENANCE INTERVENTION PARAMETERS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
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<tbody>
<tr>
<td>1.19</td>
<td>Flushing Scheduled by Superintendent</td>
<td>M</td>
<td>1.19.1. Any flushing hazardous to traffic</td>
<td>4 hours</td>
<td>5m in 10km</td>
<td>Treat prior to rains or extreme high temperatures</td>
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<tr>
<td></td>
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<td></td>
<td>1.19.2. Any picking up on vehicle tyres</td>
<td>4 hours</td>
<td>5m in 10km</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>1.19.3. 10 m length on curve</td>
<td>2 weeks</td>
<td>20m in 10km</td>
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<td></td>
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<td>1.19.4. 20 m² area on straights</td>
<td>2 weeks</td>
<td>50m² in 10km</td>
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<td>A</td>
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<td>Refer also to '1.4 Insufficient Surface Texture' defect</td>
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<td>1.19.11. 10 m length on curve</td>
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<td>1.19.12. 20 m² area on straights</td>
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<td>C</td>
<td>1.19.13. Any flushing hazardous to traffic</td>
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<td>1.19.14. Any picking up on vehicle tyres</td>
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<td>1.19.16. 20 m² area on straights</td>
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<td>1.21</td>
<td>Debris and foreign material (traffic lane and shoulder)</td>
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<td>1.21.1. Any debris/foreign material hazardous to traffic</td>
<td>2 hours</td>
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<td>1.21.2. Any unsightly</td>
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<td>1.21.3. 10 mm depth (traffic lane or sealed shoulder)</td>
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<td>10m² in 10km</td>
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<td>2.21.4. 10 mm depth adjacent kerbing with subsurface drains or deflects surface drainage of pavement</td>
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<td></td>
<td>M, A</td>
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<td>2.21.6. Any unsightly</td>
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<td>1.21.9. 20 mm depth (unsealed shoulder)</td>
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<td>50m in 10km</td>
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<tr>
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<td>Debris and foreign material (traffic lane and shoulder)</td>
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<td>1.21.10. Any debris/foreign material hazardous to traffic</td>
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<td>1.21.13. 10 mm depth adjacent kerbing with subsurface drains or deflects surface drainage of pavement</td>
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<td>1.21.16. Any unsightly</td>
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<td>1.21.19. 20 mm depth (unsealed shoulder)</td>
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<td>50 m in 10 km</td>
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<td>1.22</td>
<td>Shoulder Scour</td>
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<td>1.22.1. 100 mm depth</td>
<td>3 months</td>
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<tr>
<td>1.23</td>
<td>Shoulder Wear</td>
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<td>1.23.1. 20 mm ponding of water</td>
<td>Before next rains</td>
<td>50 m in 10 km</td>
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<td>1.23.2. Crossfall &gt;2% more than design crossfall</td>
<td>12 months</td>
<td>500 m in 10 km</td>
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<td>1.23.3. Width &gt;100 mm less than design width</td>
<td>12 months</td>
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## ROAD MAINTENANCE INTERVENTION PARAMETERS

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<tbody>
<tr>
<td>2</td>
<td>UNSEALED ROADWAY On-road Scheduled by Superintendent</td>
<td>D</td>
<td>2.1.1 Potential traffic hazard 2.1.2 Safe travel speed &lt; 70% of speed environment</td>
<td>4 weeks 6 weeks</td>
<td>50m in 10km 500m in 10km</td>
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<tr>
<td>2.1</td>
<td>Corrugations: Transverse, regular and closely spaced undulations</td>
<td>D</td>
<td>2.1.1 Potential traffic hazard</td>
<td>4 weeks 6 weeks</td>
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<td>2.2</td>
<td>Depressions, Shoving and Rutting: Deformation of the surface in wheelpaths</td>
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<td>2.2.1 Potential traffic hazard 2.2.2 100mm in depth 2.2.3 Safe travel speed &lt; 70% of speed environment</td>
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<td>2.3</td>
<td>Scour Channels: Scour runnels along or across pavement</td>
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<td>2.4</td>
<td>Loose materials: Dustholes, windrows, unbound gravel material on pavement</td>
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<td>2.4.1 Potential traffic hazard 2.4.2 Safe travel speed &lt; 70% of speed environment</td>
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<td>2.5</td>
<td>Insufficient Crossfall: Crossfall less than design</td>
<td>D</td>
<td>2.4.1 Water ponds &gt; 50% width</td>
<td>4 weeks 3 months</td>
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<td>3</td>
<td>DRAINAGE</td>
<td>3.1</td>
<td>Surface Drains: Water ponding; blocked or silted; excessive weed and vegetation growth</td>
<td>Any 3.1.1. Any potential to cause adjacent pavement failure 3.1.2. Functioning &lt; 75% of design capacity</td>
<td>1 week 6 months</td>
<td>10m in 10km 500m in 10km</td>
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<tr>
<td>3.1</td>
<td>Surface Drains: Water ponding; blocked or silted; excessive weed and vegetation growth</td>
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<td>3.1.3. Ponding &gt; 30 m in length</td>
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<td>500m in 10km</td>
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<td>Surface Drains: Water ponding; blocked or silted; excessive weed and vegetation growth</td>
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<td>3.1.4. Ponding &gt; 50m in length</td>
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<td>Surface Drains: Water ponding; blocked or silted; excessive weed and vegetation growth</td>
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<td>3.1.5. Ponding &gt; 50m in length</td>
<td>1 month</td>
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<tr>
<td>3.2</td>
<td>Sub soil Drains: Blocked or silted; damaged or broken</td>
<td>Any</td>
<td>3.2.1. Any potential to cause adjacent pavement failure 3.2.2. Functioning &lt; 75% of design capacity</td>
<td>1 week 6 months</td>
<td>10m in 10km 500m in 10km</td>
<td>Inspect annually and treat prior to Winter / wet season</td>
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<td>ITEM</td>
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<td>ROAD CATEGORY</td>
<td>MAXIMUM INTERVENTION LEVEL</td>
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<td>3.3</td>
<td>Piped Drainage Systems: Blocked or silted; damaged or broken</td>
<td>Any</td>
<td>3.3.1. Flooding</td>
<td>4 hours</td>
<td>1 site / Network</td>
<td>Inspect annually and treat prior to Winter / wet season</td>
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<td>3.3.2. Unacceptable risk of structural failure</td>
<td>1 day</td>
<td>1 site / Network</td>
<td>1 m³ per site 5% of sites</td>
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<td>3.3.3. Erosion affecting integrity of structure</td>
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<td>5% of sites</td>
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<td>3.3.4. Functioning &lt; 75% of design capacity</td>
<td>Before next rains</td>
<td>1 site / Network</td>
<td>5% of sites</td>
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<td>3.4</td>
<td>Catch Pits and Gullies: Blocked or silted; damaged or broken</td>
<td>Any</td>
<td>3.4.1. Flooding</td>
<td>4 hours</td>
<td>1 site / Network</td>
<td>Inspect annually and treat prior to Winter / wet season</td>
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<td>3.4.2. Unacceptable risk of structural failure</td>
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<td>1 site / Network</td>
<td>5% of sites</td>
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<td>3.5</td>
<td>Storm Water Sumps: Silted; excessive weed and vegetation growth; reduced permeability; scour</td>
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<td>3.5.1. Scour affecting integrity of structure</td>
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<td>Inspect annually and treat prior to Winter / wet season</td>
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<td>1 site / Network</td>
<td>5% of sites</td>
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<td>3.6</td>
<td>Kerbs and Gutters: Damaged or broken</td>
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<td>3.6.1. Projects 50mm into trafficked areas</td>
<td>1 week</td>
<td>1m in 10km 10m in 10km</td>
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<td>3.6.2. 1m length broken, displaced or missing</td>
<td>3 months</td>
<td>1 site / Network</td>
<td>5% of sites</td>
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<tr>
<td>3.7</td>
<td>Bridge Scuppers: Blocked or silted</td>
<td>Any</td>
<td>3.7.1. Openings functioning &lt;75% of design capacity</td>
<td>Before next rains</td>
<td>1 site / Network</td>
<td>5% of sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.7.2. capacity</td>
<td>10% on bridge</td>
<td>1 site / Network</td>
<td>5% of sites</td>
</tr>
<tr>
<td>3.8</td>
<td>Culverts: Structural damage; blocked or silted; scoured inlet/outlet</td>
<td>Any</td>
<td>3.8.1. Unacceptable risk of structural failure</td>
<td>1 day</td>
<td>1 site / Network</td>
<td>Inspect annually and treat prior to Winter / wet season</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.8.2. Erosion affecting integrity of structure</td>
<td>1 month</td>
<td>1 site / Network</td>
<td>5% of sites</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.8.3. Functioning &lt; 75% of design capacity</td>
<td>Before next rains</td>
<td>1 site / Network</td>
<td>5% of sites</td>
</tr>
<tr>
<td>3.9</td>
<td>Floodways: Silted; scour; excessive weed and vegetation growth</td>
<td>Any</td>
<td>3.9.1. Scour affecting integrity of structure</td>
<td>1 month</td>
<td>1 site / Network</td>
<td>Inspect annually and treat prior to Winter / wet season</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3.9.2. Functioning &lt; 75% of design capacity</td>
<td>Before next rains</td>
<td>1 site / Network</td>
<td>5% of sites</td>
</tr>
</tbody>
</table>

**Notes:**
- 1m³ per site 5% of sites
- 1 site / Network
- Inspect annually and treat prior to Winter / wet season
## ROAD MAINTENANCE INTERVENTION PARAMETERS

### 3.10 Waterways:
- blocked or silted; flotsam; erosion; scour; excessive weed and vegetation growth

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| 3.10  | Any                                                                                              |                | 3.10.1. Any flotsam/debris caught on substructure  
3.10.2. Any large tree or flotsam within 50 m upstream of structure  
3.10.3. Significant erosion near culvert or bridge structure  
3.10.4. Functioning < 75% of design capacity                                                                 | 1 week          | 5% of sites                                                                                               | Inspect annually and treat prior to Winter / wet season  
Refer also to '4.1 Bridge Substructure' defect                                                                 |

### 3.11 Revetment, Stone Pitching, Rock Protection, Erosion; scour; excessive weed and vegetation growth

<table>
<thead>
<tr>
<th>ITEM</th>
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<th>ROAD CATEGORY</th>
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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.11</td>
<td>Any</td>
<td></td>
<td>3.11.1. Structural integrity of feature is affected</td>
<td>1 month</td>
<td>5% of sites</td>
<td>Inspect annually and treat prior to Winter / wet season</td>
</tr>
</tbody>
</table>

### 3.12 Banks and Levees:
- Erosion; scour

<table>
<thead>
<tr>
<th>ITEM</th>
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<th>ROAD CATEGORY</th>
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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| 3.12  | Any                                                                                              |                | 3.12.1. Erosion channels or scour likely to affect structural integrity or function  
3.12.2. Any top level of surface lower than 200 mm below design                                                                 | 3 months       | 5% of sites                  | Inspect annually and treat prior to Winter / wet season |

### 4 STRUCTURES

#### 4.1 Bridge Substructure:
- Scour around rock protection or piles; damage to structure

<table>
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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| 4.1   | Any                                                                                              |                | 4.1.1. Immediately report any structural damage to the Superintendent  
4.1.2. Erosion channels or scour likely to affect structural integrity or function                                                                 | 4 hours          | N/A                          | Main Roads to carry out urgent inspection / assessment  
1site /Network                                                                                      |

#### 4.2 Bridge superstructure:
- Broken or damaged handrails; blocked expansion joints
- Cleaning of expansion joints is Scheduled by Superintendent

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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| 4.2   | Any                                                                                              |                | 4.2.1. Any damage liable to become a traffic hazard  
4.2.2. Any damage to structural integrity of handrails  
4.2.3. Expansion joint blocked                                                                 | 1 day          | 1site /Network                |                                                                            |

#### 4.3 Grids:
- Silted; damage to structure
- Structural damage to be Scheduled by Superintendent

<table>
<thead>
<tr>
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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
</table>
| 4.3   | Any                                                                                              |                | 4.3.1. Any damage liable to become a traffic hazard  
4.3.2. Rails loose  
4.3.3. Concrete spalls > 100mm wide  
4.3.4. Silt or debris > 200mm deep or reaching steelwork                                                                 | 2 days         | 1site /Network                |                                                                            |
### ROAD MAINTENANCE INTERVENTION PARAMETERS

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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.4</td>
<td>Railway Crossings:</td>
<td>Any</td>
<td>4.4.1. Immediately report any defects or damage within 3m of outer rails to rail authority</td>
<td>4 hours</td>
<td>N/A.</td>
<td>Rail authority responsible for railway crossings within 3m of outer rails.</td>
</tr>
<tr>
<td></td>
<td>Damaged pavement;</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td>damaged or faulty signals;</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>gates and signs</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.5</td>
<td>Guard rail and Safety Barriers:</td>
<td>Any</td>
<td>4.5.1. Any damage liable to become a traffic hazard</td>
<td>2 days</td>
<td>1 site / Network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damaged rail or barrier</td>
<td></td>
<td>4.5.2. Loss of structural integrity</td>
<td>2 weeks</td>
<td>1 site / Network</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>4.5.3. Damaged rail or components bent &gt; 300 mm out of line</td>
<td>3 months</td>
<td>50m in 10km</td>
<td></td>
</tr>
<tr>
<td>4.6</td>
<td>Wire Rope Barrier:</td>
<td>Any</td>
<td>4.6.1. Loss of structural integrity</td>
<td>1 day</td>
<td>1 site / Network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damaged posts, wire or other components</td>
<td></td>
<td>4.6.2. Other damage not affecting structural integrity</td>
<td>2 weeks</td>
<td>1 site / Network</td>
<td></td>
</tr>
<tr>
<td>4.7</td>
<td>Fences:</td>
<td>Any</td>
<td>4.7.1. Damage affecting practical effectiveness of fence</td>
<td>1 week</td>
<td>50m in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Damaged</td>
<td></td>
<td>4.7.2. Poor aesthetics when viewed from road</td>
<td>6 months</td>
<td>500m in 10km</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TRAFFIC DEVICES</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.1</td>
<td>Regulatory Signs:</td>
<td>Any</td>
<td>Physical damage and alignment</td>
<td></td>
<td>Refer to Annexure 11A.1.5 for interpretation of night legibility.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Poor legibility; poor post alignment</td>
<td></td>
<td>5.1.1. Sign not visible or missing</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1.2. Broken or bent post hazardous to traffic</td>
<td>4 hours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1.3. Other damage</td>
<td>1 week</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1.4. Vertical variance &gt; 75mm at 1.5m height of post</td>
<td>1 month</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Legibility</td>
<td></td>
<td>5.1.5. &gt; 25% of sign legend illegible</td>
<td>2 days</td>
<td>100% of speed zone numbers to be legible</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1.6. Sign illegible at night &lt; 100m distant using low beam</td>
<td>1 week</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1.7. Sign dirty (&gt;20% loss of retroreflectivity)</td>
<td>1 week</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>5.1.8. Sign reflecting glare back at motorists</td>
<td>1 week</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ITEM</td>
<td>DEFECT</td>
<td>ROAD CATEGORY</td>
<td>MAXIMUM INTERVENTION LEVEL</td>
<td>MAXIMUM RESPONSE TIME</td>
<td>MAXIMUM DEFECTIVE CONDITION</td>
<td>COMMENTS</td>
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</tr>
</tbody>
</table>
| 5.2  | Warning and Hazard Signs: Poor legibility; poor post alignment | Any | Physical damage and alignment  
5.2.1. Sign not visible or missing  
5.2.2. Broken or bent post hazardous to traffic  
5.2.3. Other damage  
5.2.4. Vertical variance > 75mm at 1.5m height of post  
Legibility  
5.2.5. > 25% of sign legend illegible  
5.2.6. Sign illegible at night < 100m distant using low beam  
5.2.7. Sign dirty (>70% loss of retroreflectivity)  
5.2.8. Sign reflecting glare back at motorists | 1 day  
4 hours  
1 week  
1 month | | Refer to Annexure 11A.1.5 for interpretation of night legibility. |
| 5.3  | Directional, Information and Other Signs: Poor legibility; poor post alignment | Any | Physical damage and alignment  
5.3.1. Sign not visible or missing  
5.3.2. Broken or bent post hazardous to traffic  
5.3.3. Other damage  
5.3.4. Vertical variance > 75mm at 1.5m height of post  
Legibility  
5.3.5. Any part of a word, number or legend illegible  
5.3.6. Sign illegible at night < 100m distant using low beam  
5.3.7. Sign dirty (>20% loss of retroreflectivity)  
5.3.8. Sign reflecting glare back at motorists | 1 month  
4 hours  
1 week  
1 month | | Refer to Annexure 11A.1.5 for interpretation of night legibility. |
<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
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<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.4</td>
<td>Guideposts: Missing; damaged; degraded paint/post; poor post alignment</td>
<td>M, A</td>
<td>On horizontal curves 5.4.1. 20% of delineators missing or defective 5.4.2. 2 consecutive posts missing 5.4.3. Inability to see at least 3 delineators on the back of the curve at night using low beam On straight and vertical curves 5.4.4. 20% of delineators missing or defective 5.4.5. Inability to see at least 1 pair of posts ahead from any guide post location at night using low beam 5.4.6. 50% of white face degraded 5.4.7. Vertical variance &gt; 50 mm at top of post</td>
<td>2 days 2 days 2 days</td>
<td>1% of road 1% of road</td>
<td></td>
</tr>
<tr>
<td>5.4</td>
<td>Cont.</td>
<td>B, C</td>
<td>On horizontal curves 5.4.8. 20% of delineators missing or defective 5.4.9. 2 consecutive posts missing 5.4.10. Inability to see at least 3 delineators on the back of the curve at night using low beam On straight and vertical curves 5.4.11. 20% of delineators missing or defective 5.4.12. Inability to see at least 1 pair of posts ahead from any guide post location at night using low beam 5.4.13. 50% of white face degraded 5.4.14. Vertical variance &gt; 50 mm at top of post</td>
<td>1 week 1 week 1 week</td>
<td>1% of road 1% of road</td>
<td></td>
</tr>
</tbody>
</table>
# ROAD MAINTENANCE INTERVENTION PARAMETERS

<table>
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<tr>
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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>D</td>
<td>On horizontal curves 5.4.15. 20% of delineators missing or defective 5.4.16. 2 consecutive posts missing 5.4.17. Inability to see at least 3 delineators on the back of the curve at night using low beam</td>
<td>Any</td>
<td>2 week 2 week 2 week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>On straits and vertical curves 5.4.18. 20% of delineators missing or defective 5.4.19. Inability to see at least 1 pair of posts ahead from any guide post location at night using low beam</td>
<td>Any</td>
<td>2 week 2 week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>5.4.20. 50% of white face degraded 5.4.21. Vertical variance &gt; 50 mm at top of post</td>
<td>Any</td>
<td>2 month 1% of road 2 month 1% of road</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.5</td>
<td>Reference Markers: Missing; damaged 5.5.1. Marker not visible or missing 5.5.2. Numbers illegible when viewed from vehicle travelling at 80 km/h</td>
<td>Any</td>
<td>3 months 1 in 20km 3 months 1 in 10km</td>
<td></td>
<td></td>
<td>Refer to Annexure 11A.1.5 for interpretation of night legibility.</td>
</tr>
<tr>
<td>5.6</td>
<td>Road Lines and Markings: Damaged; discoloured Longitudinal Lines 5.6.1. 36m continuous or 25% of total length on curves or barrier lines when viewed at night on low beam at 100m distance 5.6.2. 72m continuous or 50% of total length on straight lanes when viewed at night on low beam at 100m distance</td>
<td>Any</td>
<td>1 month 200m in 10km 1 month 500m in 10km</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Transverse Lines 5.6.3. 25% damaged or not reflecting on any lane</td>
<td>Any</td>
<td>1 month 1 per site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other Markings 5.6.4. 25% damaged or not reflecting on any lane</td>
<td>Any</td>
<td>1 month 1 per site</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ROAD MAINTENANCE INTERVENTION PARAMETERS

### 5.7 Raised Retro-Reflective Pavement Markers: Missing; damaged

- **Category**: Any
- **Maximum Intervention Level**:
  - 5.7.1: 36m continuous or 25% of total missing or not reflecting on any 300m lane length on curves or barrier lines when viewed at night on low beam at 60m distance
  - 5.7.2: 72m continuous or 50% of total missing or not reflecting on any 300m lane length on straight when viewed at night on low beam at 60m distance
  - 5.7.3: 2 consecutive markers missing
- **Maximum Response Time**: 2 weeks
- **Maximum Defective Condition**: 20m in 10km
- **Comments**: Refer to Annexure 11A.1.5 for interpretation of night legibility.

### 5.8 Flexible Bollards: Missing; damaged

- **Category**: Freeway
  - 5.8.1: 2 consecutive bollards missing
  - 5.8.2: Bollard missing
  - 5.8.3: Vertical variance > 100mm at 0.6m height of bollard
- **Category**: Any
  - 5.8.4: 4 consecutive bollards missing
  - 5.8.5: Bollard missing
  - 5.8.6: Vertical variance > 100mm at 0.6m height of bollard
- **Maximum Response Time**: 1 month
- **Maximum Defective Condition**: 1 per km
- **Comments**: 10% of site

### 5.9 School Crossing Bollards: Missing; damaged

- **Category**: Any
  - 5.9.1: Bollard missing
  - 5.9.2: Bent or broken bollard hazardous to traffic
  - 5.9.3: Other damage
  - 5.9.4: 25% of individual red or white band missing
  - 5.9.5: Vertical variance > 75mm at 1.5m height of bollard
- **Maximum Response Time**: 1 week
- **Maximum Defective Condition**: 1 per site

### 5.10 Pedestrian Grab Rails: Missing; damaged

- **Category**: Any
  - 5.10.1: Grab Rail missing
  - 5.10.2: Bent or broken Grab Rail hazardous to traffic
  - 5.10.3: Other damage
  - 5.10.4: 25% of individual red or white band missing
  - 5.10.5: Vertical variance > 75mm at 1.5m height of rail
- **Maximum Response Time**: 2 weeks

### 5.11 Traffic signals: Damaged; faulty

- **Category**: Any
  - 5.11.1: Immediately report any structural damage or faults to Main Roads
- **Maximum Response Time**: 4 hours
- **Maximum Defective Condition**: N/A.
### ROAD MAINTENANCE INTERVENTION PARAMETERS

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<th>DEFECT</th>
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<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.12</td>
<td>Street Lighting: Damaged; faulty</td>
<td>Any</td>
<td>5.12.1. Immediately report any structural damage or faults to Main Roads</td>
<td>4 hours</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>VEGETATION</td>
<td>Any</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td>Vision Obstruction</td>
<td>Any</td>
<td>6.1.1. Vegetation obscures sight distance at medians, intersections and road signs</td>
<td>1 week</td>
<td>Isite /Network</td>
<td></td>
</tr>
</tbody>
</table>
| 6.2  | Vegetation Affecting Road Pavement | Any | 6.2.1. Any noticeable vegetation on road shoulder  
6.2.2. Any woody species likely to exceed 150 mm diameter or 1 m height in table drain and up to 1m up backslope (where table drains are well defined)  
6.2.3. Any woody species likely to exceed 150 mm diameter or 1 m height within 3 m of shoulder edge (where table drains are not well defined) | 3 months | 6 months | Programme work to seasonal conditions. Weeds should be treated prior to flower production. Discretion should be used for existing large trees. |
| 6.3  | Overhanging Trees and Limbs | Any | 6.3.1. Any overhanging branches with <5.5 m overhead clearance above carriageway or rest area  
6.3.2. Any tree or limb that is liable to fall and pose a potential traffic hazard | 2 months | 1 week | Refer to Annexure 11A.1.2 for Vegetation Lateral Clearance Requirements. |
| 6.4  | Excessive Roadside Vegetation | Any | 6.4.1. Any vegetation on kerbing | 1 month | | Programme work to seasonal conditions |
|      | Urban areas | 6.4.2. 200 mm height within designated maintenance area (11A.2 refers) | 1 month | | |
|      | Rural and Remote areas | 6.4.3. 300 mm height within designated maintenance area (11A.2 refers) | 3 months | | |
| 6.5  | Fire hazard | Any | 6.5.1. Any fire hazard near timber structure, roadside stopping area, etc.  
6.5.2. Any vegetation within 3m of timber structure  
6.5.3. Any vegetation within 500 mm of guideposts, signs, etc.  
6.5.4. Any vegetation on existing fire break | 2 weeks | 2 months | Programme work to seasonal conditions |
<table>
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<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.6</td>
<td>Declared Plants</td>
<td>Any</td>
<td>6.6.1. Any declared plant within the Road Reserve, designated pit or Main Roads property 6.6.2. Any other designated weed within the Road Reserve</td>
<td>3 months</td>
<td>6 months</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>ROADSIDE AND MISCELLANEOUS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7.1</td>
<td>Emergency Response</td>
<td>M, A</td>
<td>7.1.1. Any traffic accident where Police request presence 7.1.2. Any fuel, oil or chemical spills 7.1.3. Any storm damage hazardous to traffic 7.1.4. Any other emergency</td>
<td>1 hour</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B, C Urban</td>
<td>7.1.5. Any traffic accident where Police request presence 7.1.6. Any fuel, oil or chemical spills 7.1.7. Any storm damage hazardous to traffic 7.1.8. Any other emergency</td>
<td>1 hour</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B, C, D Rural</td>
<td>7.1.9. Any traffic accident where Police request presence 7.1.10. Any fuel, oil or chemical spills 7.1.11. Any storm damage hazardous to traffic 7.1.12. Any other emergency</td>
<td>2 hours</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>B, C, D Remote</td>
<td>7.1.13. Any traffic accident where Police request presence 7.1.14. Any fuel, oil or chemical spills 7.1.15. Any storm damage hazardous to traffic 7.1.16. Any other emergency</td>
<td>4 hours</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>7.2</td>
<td>Batters - Embankments: Scour; erosion; instability</td>
<td>Any</td>
<td>7.2.1. Erosion scours &gt; 200 mm depth 7.2.2. Unstable with potential for slip or falling rock debris</td>
<td>6 months</td>
<td>2 weeks</td>
<td>Repair prior to Winter / Wet season</td>
</tr>
<tr>
<td>7.3</td>
<td>Scoured Areas on Road Reserve</td>
<td>Any</td>
<td>7.3.1. Any scour likely to affect any of the following: - structural integrity of the road or structures - adjoining property - cause environmental damage</td>
<td>6 months</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## ROAD MAINTENANCE INTERVENTION PARAMETERS

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.4</td>
<td>Roadside Stopping Areas: Not clean and tidy; not conducive to a pleasant break from travel</td>
<td>Any</td>
<td>Litter and litter bins</td>
<td>1 day, 1 day</td>
<td>1 site / Network, 1 site / Network</td>
<td>Refer also to vegetation control intervention parameters</td>
</tr>
<tr>
<td></td>
<td>7.4.1. Any overflowing of bins</td>
<td>Freeway</td>
<td>7.4.2. Any bins offensive in smell or attracting flies</td>
<td>1 day</td>
<td>1 site / Network, 1 site / Network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.4.3. Any litter &gt; 0.5 m² within rest area</td>
<td>Freeway</td>
<td>7.4.4. Any litter larger than cigarette packet size within rest area and visual in immediate surrounds</td>
<td>1 week</td>
<td>1 site / Network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.4.5. Any toilet or other amenity facilities not clean and functional</td>
<td>Freeway</td>
<td>Facilities</td>
<td>1 day</td>
<td>1 site / Network, 1 site / Network</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.4.6. Any tables, fireplaces and other furniture not clean and functional</td>
<td>Freeway</td>
<td>Furniture</td>
<td>1 week</td>
<td>1 site / Network, 1 site / Network</td>
<td></td>
</tr>
<tr>
<td>7.5</td>
<td>Litter</td>
<td>Freeway</td>
<td>7.5.1. Any animal carcase visible from road or adjacent paths</td>
<td>1 day</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.2. Any litter larger than cigarette packet size visible from road or adjacent paths</td>
<td>Freeway</td>
<td>7.5.3. Any other litter</td>
<td>2 days</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.4. Any animal carcase visible from road or adjacent paths</td>
<td>A</td>
<td>7.5.5. Any litter &gt; 0.5 m² visible from road or adjacent paths</td>
<td>3 months</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.6. Any litter larger than cigarette packet size visible from road or adjacent paths</td>
<td>A</td>
<td>7.5.7. Any other litter</td>
<td>12 months</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.8. Any animal carcase visible from road or adjacent paths</td>
<td>B</td>
<td>7.5.9. Any litter &gt; 0.5 m² visible from road or adjacent paths</td>
<td>4 days</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.10. Any litter larger than cigarette packet size visible from road or adjacent paths</td>
<td>B</td>
<td>7.5.11. Any other litter</td>
<td>4 days</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.12. Any other litter</td>
<td>B</td>
<td>7.5.13. Any other litter</td>
<td>3 months</td>
<td>Nil</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7.5.14. Any other litter</td>
<td>B</td>
<td>7.5.15. Any other litter</td>
<td>12 months</td>
<td>Nil</td>
<td></td>
</tr>
</tbody>
</table>
### Road Maintenance Intervention Parameters

<table>
<thead>
<tr>
<th>ITEM</th>
<th>DEFECT</th>
<th>ROAD CATEGORY</th>
<th>MAXIMUM INTERVENTION LEVEL</th>
<th>MAXIMUM RESPONSE TIME</th>
<th>MAXIMUM DEFECTIVE CONDITION</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>7.6</td>
<td>Unauthorised Signs</td>
<td>Any</td>
<td>7.6.1. Any unauthorised sign</td>
<td>1 week</td>
<td>10 / Network</td>
<td>Refer to Police for directions</td>
</tr>
<tr>
<td>7.7</td>
<td>Abandoned Vehicles</td>
<td>Any</td>
<td>7.7.1. Any vehicle in a position likely to be hazardous to traffic 7.7.2. Any abandoned vehicle</td>
<td>4 hours 1 week</td>
<td>1 / Network 1 / Network</td>
<td>Refer to Annexure 11A.1.3 for List of Designated Graffiti Sites.</td>
</tr>
<tr>
<td>7.8</td>
<td>Graffiti</td>
<td>Any</td>
<td>7.8.1. Any sign structure or roadside area highly visible to the public and the content is considered to be offensive 7.8.2. Any designated graffiti site 7.8.3. Any other graffiti</td>
<td>1 day 3 days 5 days</td>
<td>N/A 10 / Network</td>
<td></td>
</tr>
<tr>
<td>7.9</td>
<td>Vandalism</td>
<td>Any</td>
<td>7.9.1. Any vandal damage liable to become a traffic hazard 7.9.2. Any other vandal damage to signs, structures or roadside areas</td>
<td>1 day 4 days</td>
<td>N/A 10 / Network</td>
<td></td>
</tr>
<tr>
<td>7.10</td>
<td>Damaged Footpaths, Median Island and other Paving</td>
<td>Any</td>
<td><strong>Pedestrian areas</strong> 7.10.1. 10 mm abrupt height at joints/edges 7.10.2. 30 mm mound or depression</td>
<td>1 week 4 weeks</td>
<td>2 in 10km 2 in 10km</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>Non-pedestrian areas</strong> 7.10.3. 30 mm abrupt height at joints/edges 7.10.4. 50 mm mound or depression</td>
<td>2 weeks 4 weeks</td>
<td>2 in 10km 2 in 10km</td>
<td></td>
</tr>
</tbody>
</table>
ANNEXURE 11A.2  VEGETATION LATERAL CLEARANCE REQUIREMENTS

1. GENERAL

The Contractor must carry out vegetation control to the clearance requirements of the Contract.

2. CLEARING ZONE

The Contractor must ensure that vegetation is cleared and maintained throughout the Network to the standard identified in figure 1 Typical Cross Section. The Contractor must ensure that vegetation is cleared and maintained throughout Network areas with powerlines to the standard identified in figure 2 – Vegetation Clearance Requirements at Powerlines.

The Contractor must maintain the vegetation abutting the Royal Flying Doctor Service emergency airstrip, located south of Nanutarra Roadhouse on North West Coastal highway (H007, 828.3 SLK to 829.9 SLK), to a height not exceeding 300mm for 40 metres either side of the bitumen edge. A 100 metre section on the North and South approaches must be maintained to taper back to the nominal clearance widths as per the Contract.

In general the Contractor must ensure that the designated maintenance area extends a distance of 5m, measured from the edge of the shoulder. Where table drains occur, the Contractor must ensure that the designated maintenance area extends to a distance of 1m beyond the table drain invert.

3. CLEARING PRACTICE

The Contractor must adopt and carry out the work in accordance with the following principles and practices during clearing of vegetation:

- over head clearing practice is to remove the intruding branches back to the supporting limb or main trunk of the tree;

- ground level clearing practice for woody weeds is to remove all plants within the designated maintenance area;

- plants growing outside the designated maintenance area must have all woody material encroaching into the zone removed back to the main part of the plant;

- all trees greater than 150mm trunk diameter must not be removed without prior consultation the Superintendent. Pruning of limbs is still permitted; and

- large significant trees do exist within the designated maintenance area and these can not be removed without prior consultation with the Superintendent. Removal of limbs where required is still permitted.
No woody species likely to exceed 150mm or 1m in height to exist within 3m of the outer shoulder edge (refer to Defect 6.2.3 in the Road Maintenance Intervention Parameters table in Annexure 11A).

TYPICAL ARID REGION PROFILE

Typical Cross Sections for Vegetation Control
(Designated Maintenance Area For Annexure 11A Item 6.4)
FIGURE 2 Vegetation Clearance Requirements at Powerlines
ANNEXURE 11A.3 LIST OF GRAFFITI SITES REQUIRING FREQUENT INSPECTION

There are no designated graffiti sites within the Contract area requiring frequent inspection.
ANNEXURE 11A.5 PERFORMANCE SPECIFICATION FOR SIGNS AND ROADMARKINGS

1. SCOPE

The Contractor acknowledges that the function of signs and road markings is to provide guidance and safe and effective delineation to road users. This specification identifies the Contractor’s performance criteria for signs and road markings, including raised pavement markers, which are used for delineation.

2. REFERENCES

APAS (Australian Paint Approval Scheme) Specification GPC-P-41/5
“Water borne, suitable for drop on bead application”.
AS 1742.2 “Manual of uniform traffic control devices - traffic control devices for general use”.
AS 1742.8 “Manual of uniform traffic control devices – freeways”.
AS 1906.1 “Retroreflective materials”.
AS 1906.3 “Raised pavement markers (retroreflective and non-retroreflective)”.
AS 2009 “Glass beads for road-marking”.
AS 4049.1 “Solvent-borne paint for use with drop on beads”.
AS 4049.2 “Thermoplastic road marking materials”.
AS 4049.3 “Waterborne paint – For use with drop-on beads”.
WA 841.1 “Luminance factor of pavement markings”.

3. DEFINITIONS

A “300m segment” for road marking assessment, is any 300 metre length of a longitudinal line.

A “group” is a continuous homogeneous length of raised pavement markers along a longitudinal line or the total number of raised pavement markers at an intersection.

“Pavement Markings” means surface markings, raised pavement markers, traffic domes and the like placed on the pavement for the control and guidance of traffic. Pavement markings are detailed in AS 1742.2.

“Long life markings” means pavement markings which conform with the requirements of Clause 7 Field Testing of AS 4049.2.

A “raised pavement marker” is a retroreflective device used to supplement traffic lines on the road surface.

A “barrier line (one way or two way)” is a pair of longitudinal lines marked on the carriageway to prohibit overtaking movements in one or both directions.

A “longitudinal line” is an unbroken or a broken line, or a combination of both, marked generally parallel to the direction of travel.

“Transverse lines” refers to lines that are marked at angles, including right angles, to the general direction of traffic flow.

“Other markings” refers to diagonal and chevron markings, pavement messages, arrows and symbols and other markings as detailed in AS 1742.2 or AS 1742.8.

“Luminance factor” is the ratio of the luminance of a surface to that of an ideal white diffusing surface illuminated and viewed under the same conditions and viewing geometry and is expressed as a decimal in the range 0 to 1.
“Retroreflectivity” refers to the coefficient of luminous intensity per unit area (CIL/m²) measured on retroreflective sign and roadmarking materials and is expressed in candela per lux per square metre (cd/lx.m²).

4. MATERIALS

The Contractor must use suitable materials and appropriate application processes to ensure that roadmarkings maintain the specified performance levels during the lifetime of the marking. The Contractor must use the following materials in these specific locations:

- For longitudinal lines on roads carrying a traffic volume of greater than 35,000 AADT, waterborne paints or a material with an expected lifetime equal to or greater than a waterborne paint must be used. Evidence of the performance of products other than waterborne paint must be provided to the Superintendent;

- For chevron markings on freeways and controlled access highways, long life markings must be used;

- For turn lines on any road or highway, long life markings which have rapid setting times must be used.

Where the following materials are used for pavement marking the material must comply with the requirements specified below:

4.1 Waterborne Road Marking Paint

The Contractor must ensure that waterborne road marking paint is an APAS approved product which conforms to the requirements of APAS Specification GPC-P-41/5.

4.2 Solvent-borne Road Marking Paint

The Contractor must ensure that solvent-borne road marking paint conforms to the requirements of AS 4049.1.

4.3 Thermoplastic Road Marking Material

The Contractor must ensure that thermoplastic road marking material conforms to the requirements of AS 4049.2.

4.4 Glass Beads

The Contractor must ensure that drop-on glass beads conform to the requirements of AS 2009. If the Contractor uses larger sized drop-on beads the Contractor must ensure that they conform to the requirements of Type 3, 4 or 5 beads specified in section 718.19 of the US Federal Highway Administration standard specifications, FP-92.

4.5 Cold Applied Plastics (Long life markings)

The Contractor must ensure that cold applied plastics conform to the requirements of Clause 7 of AS 4049.2 for field testing. The Contractor must ensure that cold applied plastics also incorporate intermix glass beads at the time of manufacture or application.

4.6 Raised Pavement Markers

The Contractor must ensure that all raised pavement markers are white, yellow and red retroreflective raised pavement markers complying with the performance requirements for new markers specified in AS 1906.3. The Contractor must ensure that casing of the markers is be white in colour except for yellow markers which must have a yellow casing.
4.7 Sign Posts and Aluminium Sheeting

The Contractor must ensure that sign posts, aluminium sheeting and extruded aluminium section comply with the requirements of the Materials and Technical Specifications, the Repair Standards and the Principal’s Standard Drawings.

5. PERFORMANCE CRITERIA

The Contractor must ensure that the signs or road markings comply with the following criteria at any stage during the period of the Contract.

5.1 Raised Pavement Markers

5.1.1 Safety

Markers must not shatter, break or detach in a manner which constitutes a hazard for the road user.

5.1.2 Retroreflectivity

When measured in accordance with AS 1906.3 (1992) Appendix A at an observation angle of 0.2° and an entrance angle of 0° the CIL value for any marker must be greater than:

- White markers: 10 mcd/lx
- Yellow markers: 6 mcd/lx
- Red markers: 3 mcd/lx

5.1.3 Replacement of Raised Pavement Markers

In order to provide a uniform visual guide to the road user, all markers within a 300m segment must be replaced where the length of defective markers exceeds:

- 36m continuous or 25% of total on any 300m lane length on curves and barrier lines; or
- 72m continuous or 50% of total on any 300m lane length on straights.

5.1.4 Longitudinal Lines, Transverse Lines and Other Roadmarkings

5.1.5 Colour

(a) White markings – must be whiter in appearance than the colour “Y35 Off White” as specified in AS 2700.

(b) Yellow markings – the colour must be equivalent to “Y12 Wattle” or “Y14 Golden Yellow” as specified in AS 2700, or colours which fall between these two colours.

5.1.6 Retroreflectivity

The retroreflectivity of any marking or 300m segment of a longitudinal line must exceed the following when measured in dry conditions in accordance with AS 4049.2 or AS 4049.3:

- 100 mcd/lx.m^2 for white markings
- 70 mcd/lx.m^2 for yellow markings.
5.1.7 Luminance

The luminance factor must exceed the following when measured in accordance with Main Roads Test Method WA 841.1:

a) 40% for white markings
b) 30% for yellow markings

5.1.8 Skid Resistance

The average Skid Resistance Value (SRV) must be greater than 45 when measured in accordance with AS 4049.2.

5.1.9 Thickness

Except where specified for tactile purposes, the thickness of roadmarking material must not exceed 5mm.

5.1.10 Replacement of Longitudinal Lines, Transverse Lines and Other Roadmarkings

In order to provide a uniform visual guide to the road user, all longitudinal lines within a 300m segment must be replaced where the length of defective longitudinal line exceeds:

a) 36m continuous or 25% of total on any 300m lane length on curves and barrier lines; or
b) 72m continuous or 50% of total on any 300m lane length on straights.

For transverse lines and other roadmarkings the whole marking must be replaced where more than 25% of the marking is defective.

5.1.11 Signs

5.1.12 Colour Fade Or Change

For blue, brown or green signs the change in colour when compared to a sample of the same new material must be better than a “poor” rating when examined in accordance with AS 1906.1 Appendix H.

Red or Orange signs must comply with the luminance factor requirements detailed at clause 5.3.2 below.
<table>
<thead>
<tr>
<th>Sign Type</th>
<th>Red Regulatory Signs</th>
<th>White Regulatory Signs</th>
<th>Yellow Warning Signs</th>
<th>Hazard Signs</th>
<th>Guide, Service &amp; Tourist Signs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Description</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legend colour</td>
<td>White</td>
<td>Black, Red</td>
<td>Black</td>
<td>Black</td>
<td>White, Black</td>
</tr>
<tr>
<td>Background colour</td>
<td>Red</td>
<td>White</td>
<td>Yellow, Orange</td>
<td>White, Yellow</td>
<td>Green, Blue, Brown, White</td>
</tr>
<tr>
<td><strong>Minimum Retroreflectivity</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Class 1 legend (White)</td>
<td>40 cd/ lx.m²</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>100cd/ lx.m²</td>
</tr>
<tr>
<td>Class 1 background (Red)</td>
<td>5 cd/ lx.m²</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>50 cd/ lx.m²</td>
</tr>
<tr>
<td>Class 1 background (White)</td>
<td>n.a.</td>
<td>50 cd/ lx.m²</td>
<td>n.a.</td>
<td>n.a.</td>
<td>40 cd/ lx.m²</td>
</tr>
<tr>
<td>Class 1 background (Yellow)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>40 cd/ lx.m²</td>
<td>n.a.</td>
<td>40 cd/ lx.m²</td>
</tr>
<tr>
<td>Class 1 background (Orange)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>35 cd/ lx.m²</td>
<td>40 cd/ lx.m²</td>
<td>n.a.</td>
</tr>
<tr>
<td>Class 2 legend (White)</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
<td>40 cd/ lx.m²</td>
</tr>
<tr>
<td>Class 2 background (White)</td>
<td>n.a.</td>
<td>40 cd/ lx.m²</td>
<td>n.a.</td>
<td>n.a.</td>
<td>40 cd/ lx.m²</td>
</tr>
<tr>
<td>Class 2 background (Yellow)</td>
<td>n.a.</td>
<td>35 cd/ lx.m²</td>
<td>35 cd/ lx.m²</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Maximum Luminance Factor</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Red colour</td>
<td>0.20</td>
<td>0.20</td>
<td>n.a.</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td>Orange colour</td>
<td>n.a.</td>
<td>n.a.</td>
<td>0.60</td>
<td>n.a.</td>
<td>n.a.</td>
</tr>
<tr>
<td><strong>Minimum Internal Contrast</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ratio</td>
<td>3:1</td>
<td>3:1</td>
<td>n.a.</td>
<td>n.a.</td>
<td>3:1</td>
</tr>
</tbody>
</table>

**5.1.13 Retroreflectivity And Luminance**

The retroreflectivity value is measured in accordance with AS 1906.1 Appendix A at an observation angle of 0.2° and an entrance angle of 4°. The value must be an average of five readings equally spaced across the width of larger signs or within the area of smaller signs.

The luminance factor is measured in accordance with AS1906.1 Appendix C, using the Y function of the CIE 1964 colour system.
Appendix F

Supplemental Documents

England’s Highways Agency (HA)

Exhibits F.1 thru F.3
Exhibit F.1

HA: Rethinking Construction KPI Suggestions

The table provided in F.1 lists the suggested industry performance indicators from the Egan report. The Highways Agency has taken these indicators and integrated them into their performance framework.

Reference:
## The Scope for Sustained Improvement

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Improvement per year</th>
<th>Current performance of leading clients and construction companies</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Capital cost</strong></td>
<td>Reduce by 10%</td>
<td>Leading clients and their supply chains have achieved cost reductions of between 6 and 14% per ear in the last five years. Many are now achieving an average of 10% or greater.</td>
</tr>
<tr>
<td><strong>Construction time</strong></td>
<td>Reduce by 10%</td>
<td>Leading UK clients and design and build firms in the USA are currently achieving reductions in construction time for offices, roads, stores and houses of 10-15% per year.</td>
</tr>
<tr>
<td><strong>Predictability</strong></td>
<td>Increase by 20%</td>
<td>Many leading clients have increased predictability by more than 20% annually in recent years, and now regularly achieve predictability rates of 95% or greater.</td>
</tr>
<tr>
<td><strong>Defects</strong></td>
<td>Reduce by 20%</td>
<td>There is much evidence to suggest that the goal of zero defects is achievable across construction within five years. Some UK clients and US construction firms already regularly achieve zero defects on handover.</td>
</tr>
<tr>
<td><strong>Accidents</strong></td>
<td>Reduce by 20%</td>
<td>Some leading clients and construction companies have recently achieved reductions in reportable accidents of 50-60% in two years or less, with consequent substantial reductions in project costs.</td>
</tr>
<tr>
<td><strong>Productivity</strong></td>
<td>Increase by 10%</td>
<td>UK construction appears to be already achieving productivity gains of 5% a year. Some of the best UK and US projects demonstrate increases equivalent to 10-15% a year.</td>
</tr>
<tr>
<td><strong>Turnover and profits</strong></td>
<td>Increase by 10%</td>
<td>The best construction firms are increasing turnover and profits by 10-20% a year, and are raising their profit margins as a proportion of turnover well above the industry average.</td>
</tr>
</tbody>
</table>
Exhibit F.2

HA: Quality Management, Audit and Reporting

The Quality Management systems used by the Highways Agency are a unique feature which promotes continual improvement of work processes. In this exhibit there is a portion of the contract conditions related to quality. Accompanying this contract excerpt is the quality table detailing the point system for non-compliance.

Reference:

Used with permission by Highways Agency.
4 QUALITY MANAGEMENT, AUDIT AND REPORTING

40 Quality Management

40.1 The Provider operates a quality management system which

- complies with the relevant parts of ISO 9001:2000,
- incorporates an environmental management system consistent with ISO 14001,
- includes processes for delivering continual improvement following the guidance in ISO 9004,
- has third party certification from a UKAS approved accreditation body or is operating in preparation for accreditation within 12 months of the Contract Date and
- complies with good industry practice.

40.2 The Quality Plan incorporates the Quality Statement and is sufficiently detailed to demonstrate how the Provider will achieve each of the commitments in the Quality Statement and meet the Employer's objectives for this contract. The Provider keeps a controlled copy of the Quality Plan available for inspection by the Employer and his representatives (including the Service Manager) at all times.

40.3 The Service Manager notifies the Provider if he considers that the Quality Plan does not comply with the requirements of this contract. Following such notification the Provider reviews the Quality Plan and reports to the Service Manager setting out his proposed changes. If the Service Manager accepts the proposals, the Quality Plan is changed.

40.4 The Provider may submit to the Service Manager proposed revisions to the Quality Statement for acceptance within the period for reply. If the proposed revision to the Quality Statement will result in a reduction in the Defined Cost, the Provider specifies the amount of the reduction in his submission. A reason for not accepting the proposed revision is that
- it will not enable the Provider to meet a Performance Requirement,

- it will unacceptably increase the risk of failure to meet a Performance Requirement,

- it will not enable the Provider to achieve the level of performance specified in the Quality Statement or

- it will unacceptably increase the risk of failure to achieve the level of performance specified in the Quality Statement.

40.5 An agreed revision to the Quality Statement is not a compensation event. The Provider and the Employer share equally any savings to the Provider arising from an agreed revision to the Quality Statement.

41 Audit and Quality Management Points

41.1 The Service Manager arranges routine and additional audits of the Provider’s quality management system in accordance with the audit table. The Provider pays the Employer the cost of the additional audits.

41.2 The Service Manager may carry out supplementary audits at any time, to inspect work and materials and generally to investigate whether the Provider is performing his obligations under this contract.

41.3 The Provider allows access to the Area Network and any other premises used by the Provider to Provide the Services at all reasonable times for the Service Manager and other persons authorised by the Employer or the Service Manager to carry out audits. The Provider provides all facilities and assistance necessary to enable such audits to be carried out.

41.4 If the Provider fails to comply with his quality management system, the Provider accrues Quality Management Points from the date when the failure is identified in accordance with the quality table. The number of Quality Management Points is reduced in accordance with the quality table.

41.5 The Provider maintains a register of the number of Quality Management Points in effect, showing when Quality Management Points accrue and are removed.
41.6 If the number of Quality Management Points in effect at any time is more than 25 points, the Provider and the Service Manager meet within one week to consider ways of reducing the number of Quality Management Points in effect to 25 or less and to avoid accruing further Quality Management Points. The Provider submits a report to the Service Manager within one week of the meeting setting out

- the actions agreed at the meeting and
- any other actions which the Provider proposes to take immediately to reduce the number of Quality Management Points in effect to 25 or less and to avoid accruing further Quality Management Points.

41.7 If the Service Manager does not accept the Provider’s proposals or the Provider does not take the agreed actions, the Service Manager serves a quality warning notice on the Provider notifying the Provider that he has substantially failed to comply with his obligations. Within one week of receipt of the quality warning notice, the Provider submits a report to the Service Manager setting out the actions which the Provider has taken and what further or alternative actions he proposes to take to reduce the number of Quality Management Points in effect to 25 or less.

41.8 Following the issue of a quality warning notice and until the number of Quality Management Points in effect is reduced to 25 or less

- the Provider does not commence work in relation to any new Scheme (including any Managed Works) and
- the Employer may appoint Others to carry out or provide services in relation to any new Scheme.

41.9 Until the number of Quality Management Points in effect is reduced to 25 or less, the Provider takes the actions detailed in his reports and submits weekly update reports to the Service Manager setting out the actions he has taken, the results of those actions and the actions which are still to be taken by him.

41.10 Following the issue of a quality warning notice, the Employer may terminate if the Provider...
• fails to submit a report to the Service Manager under clause 41.6 or clause 41.7 or clause 41.9 when required to do so,

• fails to demonstrate in his reports how his proposed actions will immediately reduce the number of Quality Management Points or avoid accruing further Quality Management Points or

• fails to take the actions detailed in his reports to reduce the number of Quality Management Points in effect to 25 or less.

42 Correcting Non-conformities

42.1 The Provider corrects Non-conformities and takes action to eliminate the causes of actual or potential Non-conformities within a time which minimises the adverse effect on the Employer or Others and in any event before carrying out any operation the same or similar as that in respect of which the Non-conformity occurred.

42.2 If the Provider fails to take corrective action within the time set out in the Provider’s corrective action reports, the Provider within a period specified by the Service Manager (and in any case not later than two weeks after the failure is identified)

• establishes the reason for the failure and

• reports to the Service Manager the changes he has made to the Quality Plan to prevent further failures.

42.3 The Provider remains liable (subject to any applicable legislation relating to limitation of actions) for claims, proceedings, compensation and costs due to breaches of this contract which become apparent before or after the end of the Contract Period.

42.4 The Provider acknowledges that an Incoming Provider has the right under the Contracts (Rights of Third Parties) Act 1999 to enforce the provisions of clause 42.3.
43 **Records**

43.1 The *Provider* keeps detailed records relating to the Area Network and the Services (including performance levels in the Area Network, the Defined Cost of Providing the Services and records relating to Subcontractors) in the format and containing the details and for the period specified in the Service Information. The *Provider* makes the records available to the *Employer* and his representatives (including the *Service Manager*) on request.

43.2 The *Provider* provides information to the *Service Manager* in the form, at the times and containing the details specified in the Service Information relating to

- the Defined Cost of Providing the Services and
- performance levels in the Area Network by reference to the Performance Requirements and the performance measures referred to in the Service Information.

43.3 The *Provider* acknowledges that, for the purpose of examining and certifying the *Employer's* accounts or any examination pursuant to Section 6(1) of the National Audit Act 1983, the Comptroller and Auditor General or any other auditor appointed by the *Employer* may examine documents held or controlled by the *Provider* or any Subcontractor and may require the *Provider* to provide such oral or written explanations as he considers necessary. The *Provider* promptly complies with any such requirements at his own cost. For the avoidance of doubt, the carrying out of an examination under Section 6(3)(d) of the National Audit Act 1983 in relation to the *Provider* is not a function exercisable under this contract.
Performance Manager is to be one of the named Employer’s representatives on the Network Board and is to act as chair.

1.14 The limits of authority of the Employer’s representatives are:

- Financial .................................................................
- Contractual .............................................................

1.15 The Provider arranges progress meetings at intervals no longer than one month.

1.16 The following persons or organisations may enforce the following terms of this contract:

- Person or organisation: An Incoming Provider.

- Terms: Clauses 37.9 and 42.3.

3. Time

3.1 The starting date is ……………………………… [Note to Compiler: Insert date two weeks after date of contract award.]

3.2 The access date is ………………………………………………………………..

3.3 The contract period is [five] years commencing on the access date.

3.4 The extension period is [two] years.

3.5 The Provider submits revised programmes at intervals no longer than one month.

4. Management and audit

4.1 Quality table

The following Quality Management Points accrue for the following failures, whether arising from an audit by the Provider, the Service Manager or the relevant accreditation body:
<table>
<thead>
<tr>
<th>Failure</th>
<th>Quality Management Points</th>
<th>Period of effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failure to have a complete Quality Plan in place and operating</td>
<td>25</td>
<td>Until audit confirms that Quality Plan complete and operating</td>
</tr>
<tr>
<td>No Quality Manager in post</td>
<td>25</td>
<td>Until Quality Manager operational</td>
</tr>
<tr>
<td>Failure to raise a Non-Conformity report</td>
<td>5 per Non-Conformity</td>
<td>6 months</td>
</tr>
<tr>
<td>Failure to raise a corrective action report</td>
<td>5 per Non-Conformity</td>
<td>6 months</td>
</tr>
<tr>
<td>Failure to rectify Non-Conformity in the time set out in a corrective action report (see note 1 below)</td>
<td>5 per Non-Conformity</td>
<td>Until audit confirms rectified</td>
</tr>
<tr>
<td>Failure to correct Quality Plan in manner set out in a corrective action report (see note 1 below)</td>
<td>10 per failure</td>
<td>Until failure corrected</td>
</tr>
<tr>
<td>Failure to implement recommendations in audit report (see note 1 below)</td>
<td>5 per recommendation</td>
<td>Until audit confirms that recommendation implemented</td>
</tr>
<tr>
<td>Failure to take an agreed action to improve performance in order to meet the performance targets set by the Network Board (see note 1 below)</td>
<td>5 per failure</td>
<td>Until action taken</td>
</tr>
<tr>
<td>Failure to carry out internal audit</td>
<td>25 per audit</td>
<td>Until audit carried out</td>
</tr>
<tr>
<td>Carrying out work without release of hold point</td>
<td>10 per item</td>
<td>6 months</td>
</tr>
<tr>
<td>Failure to make records available for inspection by the Service Manager</td>
<td>10 per failure</td>
<td>Until the records are made available</td>
</tr>
<tr>
<td>Failure to allow access for Employer audits</td>
<td>10 per failure</td>
<td>Until Employer audit is carried out</td>
</tr>
<tr>
<td>Failure by Provider to accrue Quality Management Points that should have been accrued</td>
<td>The number of Points that should have been accrued</td>
<td>Applicable to the Failure that should have accrued Points</td>
</tr>
<tr>
<td></td>
<td>PLUS</td>
<td>An additional number of Points equivalent to the Points that should have been accrued</td>
</tr>
</tbody>
</table>

The number of Points that should have been accrued

Applicable to the Failure that should have accrued Points

6 months
Note 1: For these Failures additional Points are accrued at each audit until an audit confirms that rectification/correction/implementation/action has taken place.

4.2 The *audit table is*:

<table>
<thead>
<tr>
<th>Area of operations</th>
<th>Frequency of Employer audits (weeks)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Routine audits at Employer’s expense</td>
</tr>
<tr>
<td>Quality Management Points in effect</td>
<td>0 - 25</td>
</tr>
<tr>
<td>On-site work</td>
<td>26</td>
</tr>
<tr>
<td>Operational depots</td>
<td>26</td>
</tr>
<tr>
<td>Offices</td>
<td>26</td>
</tr>
<tr>
<td>Head office</td>
<td>52</td>
</tr>
</tbody>
</table>

Note 2: The Employer carries out the first additional audit as soon as the number of Quality Management Points in effect exceeds 25, 49 or 70 as the case may be.
Exhibit F.3


The MAC contract contains many Annexes when explain various facets of the contract method. This performance framework discusses the provider’s role in creating levels or work processes/plans. The work process/plans are then graded by the service manager on how well they meet and link up agency goals and objectives to 8 Key Results Areas.

Reference:


Used with permission by Highways Agency.
Managing Agent Contractor Contract

Annex 15
Performance Management and Measurement Framework
# MODEL SERVICE INFORMATION FOR MAC CONTRACT

## ANNEX 15

### CONTENTS AMENDMENT SHEET

<table>
<thead>
<tr>
<th>Amend. No.</th>
<th>Issue Date</th>
<th>Amendments</th>
<th>Initials</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>First Issue</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
15. PERFORMANCE MANAGEMENT

15.1 INTRODUCTION

15.1.1 This Annex represents a Performance Management Model for the provision of the Services, which facilitates the linkage between the Highways Agency’s outcomes/objectives, and the activities controlled by the Provider in its role as part of the “Integrated Area Team”, together with the Highways Agency Area Performance Team and Traffic Officer Service.

15.1.2 The operating principles of the Model are described in the sketch below:

15.1.3 The outcomes/objectives and levers are as the following Performance Framework Schedule. It should be noted that the levers described in the Performance Framework Schedule have developed from the Area Business Strategy Framework and will continue to change and develop over time, as more intelligence becomes available about their individual impact on delivering the outcomes/objectives, and new levers become apparent arising from sharing best practice and innovation.

15.1.4 The Provider contributes to the on-going development of the levers.

15.1.5 In accordance with the Area Business Strategy Framework the Provider develops multiple levels of levers below those shown in the Performance
Framework Schedule. The aspects in “Motivating Success – a Toolkit for Performance Measurement – Maintenance” (“the Toolkit”) may be used as guidance.

15.1.6 The various levels of levers must cover all the requirements (i.e. needs or expectations that are stated, generally implied or obligatory, including any performance targets set by the Network Board) of the Highways Agency.

15.1.7 The Provider designs Processes to execute the levers as part of its quality management system, and these must be designed to both shape the performance of the various levers, and for continual improvement. This is covered in Service Information Annex 14.

- **Section 14.3** challenges the linkage between the levers in the Performance Framework Schedule and the Provider’s Processes.
- **Section 14.4** covers re-designing those Processes as may be appropriate to achieve greater alignment with the levers in the Performance Framework Schedule, and for continual improvement.
- **Section 14.5** requires the Provider to establish performance indicators at Process and activity level to ensure that the Processes are designed to shape the performance of the levers.
- **Section 14.6** sets out the performance indicator for recording continual improvement.

15.1.8 It is crucial that intelligence is used to ensure that all levels of the Model are connected in a manner that allows clear line of sight from the work activities of the Provider, through the Processes and levers, to the outcomes/objectives.

15.1.9 Performance indicators will apply to the levers and these are described in the Toolkit, which will also be subject to on-going development. The latest version of the Toolkit is available from the Highways Agency Supply Chain Management Team:

   Email: HAPMTeam@highways.gsi.gov.uk

15.1.10 Performance targets (other than mandatory performance requirements imposed by the contract) will be set by the Network Board on an annual basis and attached to the levers. The targets will be linked to delivery of the Highways Agency’s requirements and will support the Area Business Strategy.

15.1.11 The Provider records performance using the Toolkit, and assists the Employer in its development by proposing and developing ways in which improvements can be made. No changes are implemented unless agreed in writing.

15.1.12 The Provider reports on its performance against all the indicators in the Toolkit and in accordance with Annex 19.
15.1.13 Any element of performance that does not fulfil the Highways Agency’s requirements is a Non-conformity.

15.1.14 Non-conformities may be highlighted as a result of any or all of the following:

1. Monthly or quarterly recording of performance using the Toolkit,
2. Failure to meet any target set by the Network Board,
3. Routine audits carried out by either the Employer or the Provider,
4. Additional audits carried out by the Employer, and
5. Supplementary audits carried out by either the Service Manager or the Provider.

15.1.15 The Provider maintains an up to date register recording all Non-conformities as described in Annex 19.

15.1.16 For each Non-conformity, the Provider prepares a statement and corrective action report as described in Annex 19. Should any corrective action be deemed by the Service Manager to be urgent then this should be carried out immediately. The Provider takes the actions described in the corrective action report and eliminates the cause(s) of the Non-conformity within the stated timescale, returning performance to the required level, and agrees this with the Service Manager.

15.1.17 The Service Manager reviews the Provider’s management of performance and continual improvement, and produces an annual report on the Provider’s performance based upon the monthly performance reports. This report is prepared and used by the Employer as set out in the Toolkit.
### PERFORMANCE FRAMEWORK SCHEDULE

<table>
<thead>
<tr>
<th>HA BUSINESS OUTCOMES/OBJECTIVES</th>
<th>INTEGRATED AREA TEAM OUTCOMES</th>
<th>LEVERS</th>
<th>TOOLKIT FOR PERFORMANCE MEASUREMENT REFERENCE</th>
<th>AREA OF MEASURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMPROVING ROAD SAFETY</td>
<td>OPERATIONAL SAFETY</td>
<td></td>
<td></td>
<td>Safety</td>
</tr>
<tr>
<td></td>
<td>Improve Road User Safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Make information available and liaise with stakeholders to influence road-user behaviour</td>
<td>6.1.2</td>
<td>Safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and implement programme of safety improvement Schemes</td>
<td>6.1.3</td>
<td>Safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve Road Worker Safety</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Continually review standards and introduce new measures that help to reduce accidents at road works and temporary work sites</td>
<td>6.2.1</td>
<td>Safety</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain Asset Condition</td>
<td></td>
<td></td>
<td>Product</td>
</tr>
<tr>
<td></td>
<td>Deliver programme of renewal Schemes</td>
<td>1.1.2</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain comprehensive and accurate asset inventory databases</td>
<td>1.1.3</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide rapid and effective response to defects</td>
<td>1.1.4</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver an effective winter service</td>
<td>1.1.5</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maintain Technical Standards</td>
<td></td>
<td></td>
<td>Product</td>
</tr>
<tr>
<td></td>
<td>Maintain amenity of road environment and soft estate</td>
<td>1.1.7</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td>REDUCING CONGESTION AND IMPROVING RELIABILITY</td>
<td>REDUCED CONGESTION</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve Management of Incidents</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and implement programme of congestion easing schemes</td>
<td>1.2.1</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and implement effective strategies and operational plans that reduce congestion</td>
<td>1.2.2</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Plan maintenance programme to minimise number and duration of interventions</td>
<td>2.1.1</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Maximise availability of Network at times of peak usage</td>
<td>2.1.2</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve accuracy and speed of information flows between Provider’s NCC and RCC</td>
<td>1.3.1</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Reduce clear up times for Incidents</td>
<td>1.3.2</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td>SEEKING AND RESPONDING TO FEEDBACK FROM OUR CUSTOMERS</td>
<td>HIGH QUALITY CUSTOMER SERVICE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver Improvements to journey times</td>
<td></td>
<td></td>
<td>Service</td>
</tr>
<tr>
<td></td>
<td>Improve quality of information on roadworks, incidents, events and alternative routes</td>
<td>2.2.1</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Work with stakeholders to influence travel behaviour</td>
<td>2.2.2</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver a High Level of Road User Satisfaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deal promptly and accurately with customer correspondence, enquiries and complaints</td>
<td>2.3.1</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Obtain and respond to feedback from Customers</td>
<td>2.3.2</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td>IMPROVING EFFICIENCY</td>
<td>NETWORK BEST VALUE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Improve Efficiency and Achieve Continual Improvement</td>
<td></td>
<td></td>
<td>Service</td>
</tr>
<tr>
<td></td>
<td>Assist with HA’s contribution to DfT’s efficiency target</td>
<td>2.4.1</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implement and share best practice</td>
<td>2.4.2</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Encourage innovative solutions</td>
<td>2.4.3</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Increase use of available intelligence to inform decisions</td>
<td>2.4.4</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Manage the Contract Effectively</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure effective mobilisation</td>
<td>2.5.1</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Operate as an integrated team (HA Area Team, Traffic Officer Service, Service Providers)</td>
<td>2.5.2</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ensure effective business processes and resource management systems</td>
<td>2.5.3</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Identify, manage and reduce risk</td>
<td>2.5.4</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Engage supply chain harnessing their input to delivering best value solutions</td>
<td>2.5.5</td>
<td>Service</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide accurate budget management and effective cost capture to inform future budget levels</td>
<td>4.1.1</td>
<td>Cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver accurate cost forecasts and estimates</td>
<td>4.1.2</td>
<td>Cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Provide accurate programme management</td>
<td>5.1.1</td>
<td>Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deliver accurate time forecasts and estimates</td>
<td>5.1.2</td>
<td>Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Prevent excessive rework and defects</td>
<td>3.1.1</td>
<td>Right First Time</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and operate robust quality management process controls</td>
<td>3.1.2</td>
<td>Right First Time</td>
<td></td>
</tr>
<tr>
<td>RESPECTING THE ENVIRONMENT</td>
<td>RESPECT THE ENVIRONMENT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Respect the Environment</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop sustainable operating methods and recycling initiatives</td>
<td>1.4.1</td>
<td>Product</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Develop and implement a programme of environmental improvement schemes</td>
<td>1.4.2</td>
<td>Product</td>
<td></td>
</tr>
</tbody>
</table>
Appendix G

Supplemental Documents

New Zealand Transport (NZTA)

Exhibits G.1 thru G.4
Used with permission by NZTA
Exhibit G.1

NZTA: Management Structure

Reference:
NZ Transport Agency Board

Chief Executive

Chief Executive's Office

Group Manager Strategy & Performance
- Strategic direction
- Safety
- Sustainable transport
- Strategic engagement & communication

Group Manager Planning & Investment
- Performance monitoring
- Integration support
- National planning & assessment
- Regional planning & programmes
- Programme prioritisation & management
- Service alliances

Regional Directors
- Auckland / Northland
- Waikato / Bay of Plenty
- Central
- Southern

Group Manager Highways & Network Operations
- Business development
- Network operations
- Asset management
- Infrastructure improvements
- Professional services

Group Manager Access & Use
- Regulatory integration
- Legislative frameworks & standards
- Regional operations
- User relationships
- Transport Registry Centre
- Rail

Group Manager Organisational Support
- Finance
- Information services & technology
- Corporate support
- Legal
- Risks & assurance

Group Manager People & Capability
- People strategy
- Development & capability
- People services
Exhibit G.2

NZTA: Sample Scope of Services

This is a sample taken from the Performance-Specified Maintenance Contract at the NZTA website.

Reference:

1 General Requirements

1.1 Contract Description

This PSMC is for network management and maintenance of Length km (Lane length lane.km) of state highway within Transit New Zealand’s Region Region No., including list of SH included in network.

PSMC’s consist of a single contract for the provision of all products and services associated with state highway network maintenance, and replacing the traditional two tier multiple contract system predominantly in use elsewhere in the state highway network. It seeks to maximise the skills, expertise, innovation and systems of the roading industry to provide better outcomes and thus better value for money.

Fundamental to the PSMC concept is the need for a cooperative approach by the contracting parties. The conditions of contract seeks to remove the traditional adversarial relationship between Principal, consultant and contractor.

The PSMC is a lump sum contract. The tendered lump sum includes all costs to:

a) bring the Assets up to the contracted standard;

b) ensure the Assets comply with safety standards as they may change;

c) manage the integrity of the Assets through a cost effective long term network management and maintenance strategy; and

d) provide all inspection, identification, programming, prioritization and delivery of maintenance services necessary to achieve and demonstrate compliance with the Performance Criteria.

Monthly payments will be made to the Contractor for the Services throughout the term of the Contract, in accordance with the Basis of Payment. Payment is independent of actual works and services provided but may vary subject to adjustments provided for in the Contract Documents.

The Contractor is required to implement a system to monitor its performance and to demonstrate compliance with the Performance Criteria throughout the term of the Contract sufficient to stand scrutiny under review by the Superintendent or those nominated by the Superintendent. The Superintendent will also review the Contractor’s systems, procedures and records and may inspect the Assets to ensure the Performance Criteria are achieved. The Principal, at its cost, may contract with an independent party to conduct formal audits of the Contractor’s performance, annually or as otherwise required by the Superintendent.

Innovation is strongly encouraged under PSMC. The Contractor is expected to develop innovative ways of providing the Services and achieving the Performance Criteria.
A risk is an uncertain event which when it occurs, may have a material effect on the extent of the Services to be performed by the Contractor or on the cost to the Contractor of performing the Services. The Principal is seeking to achieve price certainty with regard to the PSMC. In this regard the Principal seeks to allocate risks to the party best able to manage it. Except where explicitly stated to the contrary in Appendix 1.1, the Contractor bears all risk in the lump sum tendered price.

1.1.1 Services

The Services include the provision of all products and services required to achieve the Performance Criteria, other requirements as set out in the Contract Documents and best practice standards. The Services include all activities under the Roading Maintenance Output Class 2: State Highways, and the Improvement and Replacement of Roads Output Class 4: State Highways, both as defined in the Transfund New Zealand Programme and Funding Manual, unless specifically excluded below in Maintenance Specification, Clause 1.1.1. The following list of network management and maintenance activities to be performed under PSMC is indicative and should not be construed as being exhaustive:

a) all activities under Work Category 1: Pavement Maintenance including all routine pavement, shoulder, drainage and culvert maintenance;

b) all activities under Work Category 2: Area Wide Pavement Treatment including satisfying the requirements of Maintenance Specification, Clause 2.7;

c) all activities under Work Category 4: Maintenance Chip Seals including satisfying the requirements of Maintenance Specification, Clause 2.7;

d) all activities under Work Category 5: Thin Asphaltic Surfacing including satisfying the requirements of Maintenance Specification, Clause 2.7;

e) all activities under Work Category 6: Seal Widening including satisfying the requirements of Maintenance Specification, Clause 2.7;

f) all activities under Work Category 7: Bridge Maintenance except as specifically excluded below;

g) all activities under Work Category 10: Amenity/Safety Maintenance including vegetation control, litter removal, detritus, minor structure maintenance, routine minor safety works in accordance with Maintenance Specification, Clause 1.7.1 and Incident Response in accordance with Maintenance Specification, Clause 4.18;

h) all activities under Work Category 12: Traffic Services including sign (including those erected on gantries), edge marker post, raised pavement marker and pavement marking maintenance, except where listed as specifically excluded below in Maintenance Specification, Clause 1.1.1;
General Requirements

i) all activities under Work Category 13: Carriageway Lighting including payment of all costs and charges associated with lighting maintenance and the supply of electricity to and electricity consumed by lighting;

j) all activities under Work Category 17: Professional Services including:

- receipt of the Assets and records from the existing service suppliers and, at the completion or termination of the Contract, handover of the Assets and records, in a format specified by the Principal, to the incoming contractors

- development and implementation of a quality plan, health and safety management plan, emergency and contingency plan, safety management and intervention plan, traffic management plans and maintenance management strategy all of which must reflect the Performance Criteria and promote the Principal's overall objectives (see Maintenance Specification, Clause 1.1.2)

- asset management, including collection and update of asset inventory data including the RAMM database, Highway Information Sheets and Route Data Sheets

- preparation and delivery of the Forward Works Programme: Capital Works, Forward Works Programme: Maintenance, Annual Plan: Capital Works and Annual Plan: Maintenance for the contract area including provision of project feasibility reports

- provision of timely input plans and reports for Region Region No.

- resource management planning to the extent provided in the Contract Documents

- all network control activities including monitoring compliance with consents

- requiring, receiving, approving, co-ordinating and ensuring compliance with all Traffic Management Plans where required for any activity within the Limit of Works, including works by other contractors

- response to public complaints, requests and enquiries

- crash and damage reporting

- accident investigation of individual sites as requested and monitoring of crash reduction study sites

- provision of a qualified team member to participate in crash reduction studies undertaken by the Principal within Region Region No.
General Requirements

- provision of a qualified team member to participate in safety audits undertaken by the Principal within Region Region No.

- compliance monitoring and reporting

- achievement monitoring and reporting

- performance appraisal activities, including satisfying the requirements of Maintenance Specification, Clause 1.18

- Consultant to list any other included professional services except where listed as specifically excluded below in Maintenance Specification, Clause 1.1.1;

k) all activities under Work Category 20: Preventive Maintenance funded within the lump sum, in accordance with Maintenance Specification, Clause 1.7.2;

l) all activities under Work Category 30: Emergency Reinstatement including Incident Response in accordance with Maintenance Specification, Clause 4.18, and in so far as risk is not allocated to the Principal in Appendix 1.1;

m) all activities under Work Category 39: Road Reconstruction necessary to comply with the Performance Criteria;

n) all activities under Work Category 40: Pavement Smoothing necessary to comply with the Performance Criteria;

o) all activities under Work Category 60: Minor Safety Projects funded within the lump sum, in accordance with Maintenance Specification, Clause 1.7.2;

p) all other network management and maintenance activities necessary to bring the Assets up to the contracted standard and comply with the Performance Criteria, not specifically excluded below in Maintenance Specification, Clause 1.1.1.

q) Consultant to list any other included services

The Services specifically exclude:

i) investigation, design and surveillance of projects under Improvement and Replacement of Roads Output Class 4: State Highways, as defined in the Transfund New Zealand Programme and Funding Manual, that require funding additional to the lump sum (except for the provision of project feasibility reports);
1 General Requirements

ii) maintenance of any part of the Assets which is the subject of a separate and discreet contract to the extent provided in Maintenance Specification, Clause 1.10.2;

iii) all activities under Work Category 3: Major Drainage Control including all culvert, stormwater structure and drainage maintenance

iv) the following activities under Work Category 7: Bridge Maintenance:
  • structural repair and structural maintenance of bridges
  • installation, maintenance and removal for bailey bridging;

v) the following activities under Work Category 12: Traffic Services:
  • installation and maintenance of traffic signals, speed camera detectors, existing Transit New Zealand traffic counting station detectors and recorders, barrier arms and associated signals, moveable lane barriers, variable message signs, emergency telephones and closed-circuit televisions/cameras
  • structural repair and structural maintenance of gantries;

vi) the following activities under Work Category 17: Professional Services:
  • crash reduction studies (except to the extent provided elsewhere in the Contract Documents)
  • legalisation of existing road reserve
  • manage Transit New Zealand stock of bailey bridges
  • administration of Limited Access Road declarations
  • traffic counting surveys
  • resource management planning (except to the extent provided elsewhere in the Contract Documents)
  • General, Detailed or Special Inspections of bridges, as defined in Appendix 13.3 of the Transit New Zealand Bridge Inspection and Maintenance Manual
  • rating of bridges for overload capacity
  • supervision of the movement of over-weight or over-dimensioned vehicles
  • Consultant to list any other excluded professional services

vii) activities under Work Category 20: Preventive Maintenance that require funding additional to the lump sum, in accordance with Maintenance Specification, Clause 1.7.2:
1 General Requirements

viii) all activities under Work Category 25: Property Management;

ix) activities under Work Category 30: Emergency Reinstatement other than Incident Response in accordance with Maintenance Specification, Clause 4.18, and in so far as the risk is allocated to the Principal in Appendix 1.1;

x) all activities under Work Category 33: Traffic Management (except to the extent provided elsewhere in the Contract Documents);

xi) all activities under Work Category 35: Bridge Renewals;

xii) all activities under Work Category 38: New Roads and Bridges;

xiii) activities under Work Category 39: Road Reconstruction other than necessary to comply with the Performance Criteria;

xiv) activities under Work Category 40: Pavement Smoothing other than necessary to comply with the Performance Criteria;

xv) all activities under Work Category 42: Seal Extension;

xvi) all activities under Work Category 43: Transportation Studies;

xvii) all activities under Work Category 44: Strategy Studies;

xviii) all activities under Work Category 45: Property Purchase;

xix) activities under Work Category 60: Minor Safety Projects that require funding additional to the lump sum, in accordance with Maintenance Specification, Clause 1.7.2;

xx) Consultant to list any other excluded services

Guidance Note: Care should be taken to ensure that this list of exclusions and the above list of inclusions are mutually exclusive. Any service removed from this list of exclusions should be included on the above list of inclusions, and vice versa.

1.1.2 Contract Objectives

The objectives of the PSMC are for the Contractor and Principal to work with the Management Board to:

a) achieve the Principal’s overall objective:

Provide a safe and efficient state highway network with the highest level of availability to road users and which satisfies stakeholder expectations.
Exhibit G.3

NZTA: Performance Measures (Samples)

Here are samples for each of the 3 Performance Measurement Areas used in a Performance-Specified Maintenance Contract.

Reference:
2 Management Performance Measures

2.1 Definitions

*Management Performance Measures* reflect the Contractor’s performance in the management of the Contract and delivery of professional services. Management Performance Measures cover the Contractor’s reporting and communications, quality systems, management plans and the delivery of professional services including asset management and network control.

*Contract Standard*, in respect of Management Performance Measures, are the minimum requirements and standards the Contractor is required to comply with at all times. In addition to the Contract Standards defined in this Maintenance Specification, the requirements of the Contractor’s own management plans (refer to Quality Control Management Performance Measure) are also Contract Standards.

*Delivery Time*, in respect of Management Performance Measures, mean the time in which the Contractor must provide deliverables required by the Contract Standards. In addition to the Delivery Times defined in this Maintenance Specification, the timing requirements of the Contractor’s own management plans (refer to Quality Control Management Performance Measure) are also Delivery Times.

2.2 Meetings and Reporting

*Contract Standard* — The Contractor shall attend all meetings including but not limited to liaison, community, stakeholder and Principal meetings and prepare and deliver the following reports in accordance with the detailed requirements specified in Appendix 2.1:

a) Handover Reports;

b) Benchmarking Report;

c) Compliance Reports;

d) Monthly Reports;

e) Board Papers;

f) Accident Reports;

g) Consent Monitoring/Access Control Reports;

h) Forward Works Programmes and Annual Plans;

i) Achievement Reports;

j) Asset Register data; and
2 Management Performance Measures

k) Pavement Deterioration Modelling Reporting.

l) Traffic Management Programmes;

All reports must be complete, accurate, have a logical format and be produced to a professional standard.

Delivery Time – The Delivery Times for meetings and reports are specified in Appendix 2.1.

2.3 Quality Control – Management Plans

Contract Standard – The Contractor shall prepare and deliver the following management plans in accordance with the detailed requirements specified in Appendix 2.2:

a) Health and Safety Management Plan;

b) Contract Quality Plan;

c) Emergency Procedures and Contingency Plan;

d) Traffic Management Plans;

e) Safety Management and Intervention Plan; and

f) Environmental Protection Plan.

Delivery Time – The Delivery Times for interim plans, final plans, plan reviews and updates are specified in Appendix 2.2.

2.4 Quality Control – Implementation

Contract Standard – The Contractor shall implement the requirements and performance criteria of each management plan.

There shall be no incidences of abatement notices being issued to the Contractor or the Principal.

Delivery Time – The Delivery Times for actions required under each management plan shall be in accordance with the requirements of the plan.
2 Management Performance Measures

2.5 Safety Management

Contract Standard – The Contractor shall develop and implement a safety management system specific to the contract area and in full compliance with the Transit New Zealand Safety Management Systems Manual.

The Contractor shall manage the output of crash reduction studies as follows:

a) develop a programme for implementation of the recommended works;

b) perform those works identified as being the Contractor’s responsibility within the lump sum and any additional works directed by the Superintendent, in accordance with the programme;

c) monitor the performance of those works performed under separate contracts, in accordance with the programme; and

d) periodically update LTSA Site Implementation Report Forms.

Delivery Time – The Delivery Times for actions required under the safety management system shall be in accordance with the requirements of the Transit New Zealand Safety Management Systems Manual.

The Delivery Time for management of the output of the crash reduction study process shall be such that all identified deficiencies are rectified within the later of:

a) one year of completion of the relevant crash reduction study, for works identified as being the Contractor’s responsibility within the lump sum; or

b) six months of the Superintendent’s instruction to proceed with additional works.

2.6 Asset Management

Contract Standard – The Contractor shall carry out the following asset management functions in accordance with the detailed requirements specified in Appendix 2.3:

a) conservancy of Transit New Zealand datasets;
2 Management Performance Measures

b) RAMM validation;

c) sign inventory audits;

d) maintenance of dTIMS input file;

e) asset / network management; and

f) information technology routine change.

The Contractor systems shall be aligned with Transit New Zealand’s deployment of EXOR and the Location Referencing Management System (LRMS).

Delivery Time – The Delivery Times for actions required for each asset management function are specified in Appendix 2.3.

2.7 Treatment Design

Contract Standard – The Contractor shall carry out the design of treatments having regard to the following:

a) feedback gained from consultation with Iwi and affected residents;

b) pavement design and construction standards shall be in accordance with the requirements of Appendix 2.4. The Contractor shall demonstrate that the design and service life has been achieved following construction of the treatment;

c) environmental and social factors relating to selecting surfacing for urban areas including:

- noise control;
- needs of other urban road users eg cyclists;
- drainage problems resulting from loose chip;
- resistance to oil spills and turning action; and
- bitumen tracking into adjacent shops.

The Contractor shall submit the surfacing design for urban areas to the Superintendent for review;
Management Performance Measures

d) existing asphaltic concrete surfaces shall not be resurfaced with chip seal

e) any treatment that involves either:

i) alteration to existing geometry, such as horizontal and vertical alignment, cross section dimensions, crossfall and superelevation, berm widths and slopes within the clear zone;

ii) alteration to guidance systems, including pavement markings, RRPM's, EMP's, signs;

iii) alteration to the layout or type of kerb and channel, safety barriers, utility poles or any other roadside safety feature or hazard; or

iv) any change in the speed environment or design speed of the treatment length,

shall be subjected to both Stage 3 and Stage 4 independent Safety Audits arranged and paid for by the Contractor, in accordance with Transit New Zealand’s Safety Audit Policy and Procedures.

f) all resurfacing in the following areas shall be completed using thin asphaltic surfacing, as defined by Work Category 5 in the Transfund New Zealand Programme and Funding Manual, unless the Forward Works Programme shows that the underlying pavement is programmed for rehabilitation within two years:

i) Consultant to specify by SH and RP

ii) Consultant to specify by SH and RP

iii) ...

Guidance Note: This sub-clause applies to Region 2 only.

Delivery Time – The Delivery Times for:

a) verification of the design life for rehabilitation treatments shall be 12 months following sealing of the treatment length;
Management Performance Measures

b) surfacing design in urban areas shall be no later than one month following completion of the treatment design and at least one month prior to the programmed resurfacing;

c) Stage 3 Safety Audits shall be two weeks prior to the programmed start of construction for the treatment length; and

d) Stage 4 Safety Audits shall be two weeks following sealing of the treatment length.

2.8 Network Control

Contract Standard – The Contractor shall carry out the following network control functions in accordance with the detailed requirements specified in Appendix 2.5.

a) assist with processing applications for activities within the road corridor;

b) access control;

c) consent monitoring;

d) hazard monitoring and control;

e) management and coordination of service authority contractors; and

f) any other network control activities traditionally performed by the Principal.

Delivery Time – The Delivery Times for actions required for each network control function are specified in Appendix 2.5.
3 Key Performance Measures

3.1 Definition

Key Performance Measures reflect the overall condition of the primary Asset, the pavement. The Contractor must comply with the following Key Performance Measures.

Contract Standard, in respect of Key Performance Measures, means the minimum standard the Contractor is required to comply with at the end of each year of the Contract. Unless stated otherwise within the Contract Documents, all data required to demonstrate compliance shall have been collected and reported in accordance with Table 3.3.1.

<table>
<thead>
<tr>
<th>Table 3.1.1: Key Performance Measure Data Collection and Reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Data Collection Due</strong></td>
</tr>
<tr>
<td>Benchmarking</td>
</tr>
<tr>
<td>Compliance (Year 1)</td>
</tr>
<tr>
<td>Compliance (Year 2)</td>
</tr>
<tr>
<td>Compliance (Year 3)</td>
</tr>
<tr>
<td>Compliance (Year 4)</td>
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<tr>
<td>Compliance (Year 5)</td>
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<tr>
<td>Compliance (Year 6)</td>
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<tr>
<td>Compliance (Year 7)</td>
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<tr>
<td>Compliance (Year 8)</td>
</tr>
<tr>
<td>Compliance (Year 9)</td>
</tr>
<tr>
<td>Compliance (Year 10)</td>
</tr>
</tbody>
</table>

Guidance Note: The Consultant should specify the date for Benchmarking data collection giving due consideration to the Commencement Date and the climatic limitations of the equipment. The Consultant should specify the date for Year 10 data collection giving due consideration to the Termination Date and the climatic limitations of the equipment. Reporting dates should be a maximum of three months from the completion of data collection. The Year 10 report should be delivered prior to the Termination Date.

3.2 Key Performance Measure Year 0 Benchmark

The Contract Standards for Maximum Percent with Roughness > Threshold, Maximum Percent with Mean Texture Depth < Threshold (MPD), Maximum Percent with Mean Texture Depth > Threshold (MPD) and Skid Resistance, as specified in Maintenance Specification, Tables 3.3.2, 3.4.3, 3.4.4, 3.4.5, 3.4.6, 3.5.1, 3.5.2, 3.5.3, 3.5.4 and 3.5.5
Key Performance Measures

respectively, are fixed criteria and are not subject to adjustment based on the results of any benchmark survey.

The Contract Standard for Surfacing Life Index, as specified in Maintenance Specification, Table 3.7.1, shall be benchmarked by recalculation as at the Commencement Date to reflect the full extent of all resurfacing completed up to that date.

The Contract Standards for Roughness – Mean NAASRA, Texture – Minimum Mean Texture Depth and Rutting, as specified in Maintenance Specification, Tables 3.3.1, 3.4.1, 3.4.2 and 3.6.1 respectively, are subject to adjustment based on the results of the high speed data collection survey performed to benchmark the condition of the Assets in accordance with Maintenance Specification, Clause 5.2.2. The Contract Standard for Structural Condition Index, as specified in Maintenance Specification, Table 3.8.1, is subject to adjustment based on the results of the falling weight deflectometer survey performed to benchmark the condition of the Assets in accordance with Maintenance Specification, Clause 5.2.2. The adjustment for each Key Performance Measure in each sub-network shall be determined as follows:

a) the Management Board agree the benchmark value

b) the benchmark value shall replace the Year 0 value

c) the Year 1 to 10 values shall be adjusted so as to maintain the same numerical difference in value from the Year 0 value

This same benchmark process shall apply whether the Contract Standards were those specified in the Tender Documents or alternative values specified in the Contractor’s Tender and subsequently accepted.

The following examples are provided for the avoidance of doubt:

3.2.1 Example 1: Tender Documents

The Contract Standard for Roughness – Mean NAASRA Key Performance Measure for sub-network 1 is defined in the Tender Documents as Value.

The Roughness – Mean NAASRA Key Performance Measure is subject to benchmarking adjustment and a value of \( <<\text{Value} + 0.9>> \) is determined through the benchmark high speed data collection and accepted by the Management Board. In this event the Contract Standard would become \( <<\text{Value} + 0.9>> \).

3.2.2 Example 2: Contractor’s Tender

The Contractor’s Tender offers to reduce the Roughness – Mean NAASRA Key Performance Measure in sub-network 1 to \( <<\text{Value} - 2.4>> \) by Year 10 based on the initial Year 0 value of Value.
3 Key Performance Measures

Again a value of <<Value + 0.9>> is determined by the benchmark high speed data collection and accepted by the Management Board. In this event the Year 0 value becomes <<Value + 0.9>> and the Year 10 value becomes <<Value – 1.5>>. All other values offered in the Contractor’s Tender for Years 1 to 9 would be similarly adjusted.

3.3 Roughness

Roughness information is collected by the Contractor’s annual high speed data survey. Details of the calculation methods for roughness Key Performance Measures are included in Appendix 3.1.

3.3.1 Mean NAASRA

Contract Standard – Table 3.3.1 sets out the Contract Standard required.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sub-network</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>0</td>
<td>&lt;&lt;&gt;&gt;</td>
</tr>
<tr>
<td>&lt;&lt;1 – 2&gt;&gt;</td>
<td>&lt;&lt;&gt;&gt;</td>
</tr>
<tr>
<td>&lt;&lt;3&gt;&gt; – 10</td>
<td>&lt;&lt;&gt;&gt;</td>
</tr>
</tbody>
</table>

3.3.2 Percent with Roughness > NAASRA Threshold

Contract Standard – Table 3.3.2 sets out the Contract Standard required.

<table>
<thead>
<tr>
<th>Year</th>
<th>Sub-network</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 (Rural)</td>
</tr>
<tr>
<td></td>
<td>&lt;&lt;100&gt;&gt; NAASRA</td>
</tr>
<tr>
<td>0</td>
<td>&lt;&lt;&gt;&gt;</td>
</tr>
<tr>
<td>&lt;&lt;1 – 2&gt;&gt;</td>
<td>&lt;&lt;&gt;&gt;</td>
</tr>
<tr>
<td>&lt;&lt;3&gt;&gt; – 10</td>
<td>&lt;&lt;&gt;&gt;</td>
</tr>
</tbody>
</table>
4 Operational Performance Measures

4.1 Definition

Operational Performance Measures reflect the road users expectation about the network’s day to day serviceability. For each Operational Performance Measure the Contractor must comply with both the Contract Standard and Response Time separately, as defined below. The Contractor is required to develop and implement a compliance monitoring system in accordance with Maintenance Specification, Clause 5.3.1 to demonstrate that both Contract Standards and Response Times are being achieved.

Section means the width from the state highway centreline to the Limit of Works over the specified length, irrespective of the width of the carriageway. The centreline itself shall be included in the direction of increasing route position e.g. a 1km Section in the direction of increasing route position is the width from the state highway centreline (excluding the centreline itself) to the Limit of Works over a 1km length of highway. For the purposes of determining compliance with the Contract Standard, Sections shall not overlap and shall be consecutive. The length of a Section is specified by individual Operational Performance Measure in Maintenance Specification, Clauses 4.2 to 4.18.

Contract Standard, in respect of Operational Performance Measures, means the minimum standard the Contractor is required to comply and report compliance with at all times, regardless of whether defects have been programmed for repair within the Response Time or not. Where compliance is based on a percentage of Sections, multiple non-compliances with a single Operational Performance Measure within a single Section shall only count as one non-compliant Section. Compliance with the Contract Standard is required in each and every separate sub-network. The Management Board’s approval of an inspection procedure, in accordance with Maintenance Specification, Clause 3.3.5, will be a key component in the demonstration of compliance with the Contract Standards.

Response Time means the time in which the Contractor must rectify any particular instance of a defect, regardless of whether or not compliance is being achieved with the Contract Standard. Unless specifically requested otherwise by the Superintendent, the Contractor is required to report compliance with Response Times only for Incident Response.

The Superintendent may choose to review the Contractor’s compliance with Response Times, for example, by recording the route positions of potholes and repeating the inspection later to determine if those specific potholes have been repaired within the Response Time.

Notwithstanding any of the Response Times specified below, if any defect or problem arises that, in the opinion of the Superintendent or the Contractor’s qualified traffic safety personnel, constitutes a potential safety hazard, the defect or problem shall be rectified as soon as possible but within 24 hours.
4 Operational Performance Measures

4.2 Pavement

Pavement faults are generally described in Transit New Zealand’s C Series Standard Specifications.

Consistent texture is defined as:

- having an Average Least Dimension within 0.5mm for Grade 1 to Grade 4 chip
- the same grade for Grade 5 and Grade 6 chip

Shoves and heaves are defined in Appendix 4.1.1

Edgebreak is defined as seal loss greater than 100mm from nominal seal edge or encroaching onto the painted edge line

Contract Standards and Response Times – Contract Standards and Response Times are defined in Table 4.2.1

<table>
<thead>
<tr>
<th>Table 4.2.1: Operational Performance Measures – Pavement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Standard</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Potholes</strong></td>
</tr>
<tr>
<td>No more than &lt;&lt;3&gt;&gt;% of the number of 100m Sections with one or more defects</td>
</tr>
<tr>
<td><strong>Surfacing</strong></td>
</tr>
<tr>
<td>No more than one defect</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Heaves and Shoves</strong></td>
</tr>
<tr>
<td>No more than &lt;&lt;1&gt;&gt;% of the number of 100m Sections with defects</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>
Exhibit G.4

NZTA: Compliance Monitoring System

NZTA system used to ensure contractors are meeting the 3 performance measure areas.

Reference:
Compliance Monitoring

Contract Standards for the relevant Key Performance Measures in accordance with Maintenance Specification, Clause 3.2.

The Contract Standards for all other Key Performance Measures shall be as specified in the Contract Documents.

5.2.3 Operational Performance Measures

By the date nominated in the Contractor's Tender, the Contractor shall perform a 100% inspection of all Assets associated with Operational Performance Measures within the Limit of Works, to establish the extent to which the Assets comply with the Operational Performance Measures.

The Superintendent may, at his discretion, conduct a similar parallel inspection or engage others to perform a parallel inspection.

Within two months of completion of the Operational Performance Measure benchmarking inspection, the Contractor shall process, interpret and present the results to the Management Board in the form of a Benchmarking Report in accordance with Appendix 2.1.3. The Management Board shall satisfy itself as to the accuracy and validity of the survey results and shall then decide the period within which the Contractor shall bring the condition of the Assets into full compliance with the Operational Performance Measures, and any Contract Standards that apply to any staging in that period. The Management Board shall take note of the Principal's requirement to limit this period and shall only set it above three months where such a timeframe would be unachievable. Non-compliance notices shall only be issued in this period if the Contractor fails to comply with safety related Response Times or agreed staging requirements (see Maintenance Specification, Clause 5.4).

5.3 Compliance Monitoring

5.3.1 Contractor's Compliance Monitoring System

The Contractor must develop, implement and manage a compliance monitoring system that:

a) objectively assesses their compliance with each of the Performance Criteria;

b) monitors and reports compliance with the Contract Standard specified for each of the Performance Criteria; and

c) ensures appropriate corrective actions are developed, implemented, actioned and verified.
Compliance Monitoring

The Contractor’s compliance monitoring system must describe the process for assessing compliance for each of the Performance Criteria. This includes:

a) the personnel responsible for:
   - implementing and managing the system
   - completing the compliance assessment

b) the inspection methodology to be used to demonstrate compliance with the Operational Performance Measures in accordance with Maintenance Specification, Clause 5.3.5;

c) assessing, determining and demonstrating the percentage compliance with the Contract Standard specified for each of the Performance Criteria, where appropriate;

d) recording and reporting results;

e) developing and implementing appropriate corrective actions; and

f) making all information available for the Superintendent to audit the system.

The Contractor is required to perform its own data collection surveys to demonstrate compliance with the Performance Criteria, independent of any similar surveys performed by the Principal.

Except where otherwise provided in the Contract Documents, the Contractor’s inspections and compliance monitoring system does not provide a direct input into the non-compliance system described in Maintenance Specification, Clause 5.4. As such, a non-conformance identified by the Contractor will not necessarily attract a non-compliance notice in accordance with Maintenance Specification, Clause 5.4, where the Contractor’s non-conformance resolution has effectively addressed any systematic or procedural shortfall.

5.3.2 Superintendent’s Review

The Superintendent will review the Contractor’s systems, procedures and records to determine their effectiveness in ensuring that the Contract Standards, Response Times and Delivery Times are being achieved.

The Superintendent’s reviews do provide a direct input into the non-compliance system described in Maintenance Specification, Clause 5.4.

Superintendent’s reviews may concentrate on areas where the Contractor’s compliance monitoring system has identified a systematic failure. However, the Superintendent may review the Contractor’s procedures and work activities and may conduct specific Asset inspections at any time.
5 Compliance Monitoring

The Superintendent’s reviews will in no way limit the Contractor’s responsibility to develop, implement and manage a Contractor’s compliance monitoring system.

5.3.3 Management Performance Measures

For each Management Performance Measure, the Contractor must demonstrate compliance with the Contract Standards and Delivery Times. Compliance is required in respect of each discreet deliverable.

The Contractor’s compliance monitoring system shall record the timeliness of deliverables for each Management Performance Measure.

The Superintendent, or others engaged by the Superintendent for this purpose, shall review the standard and timeliness of deliverables.

5.3.4 Key Performance Measures

For each Key Performance Measure, the Contractor must demonstrate compliance with the Contract Standards. Compliance is required in respect of each measure in each sub-network. The Compliance Reports do provide a direct input into the non-compliance system described in Maintenance Specification, Clause 5.4.

5.3.5 Operational Performance Measures

For each Operational Performance Measure, the Contractor must demonstrate compliance with the Contract Standards and Response Times. Compliance is required in respect of each measure in each sub-network.

The Contractor’s compliance monitoring system shall record achievement of Contract Standards and Response Times (where required) for each Operational Performance Measure.

Within two months of completion of the Operational Performance Measure benchmarking inspection, in accordance with Maintenance Specification, Clause 5.2.3, the Contractor shall present to the Management Board an inspection procedure for each Operational Performance Measure proposed to demonstrate compliance with Contract Standards at any time throughout the duration of the Contract.

The Management Board shall satisfy itself to the extent that the proposed inspection procedure will satisfactorily demonstrates compliance with Contract Standards for each Operational Performance Measure and shall decide the inspection methodology to be adopted. The following is provided as a guide to the Management Board:

Where an Operational Performance Measure Contract Standard depends on a percentage non-compliance, for example ‘No more than 5% of the number of 100m Sections...’ the inspection methodology for compliance demonstration as part of the Contractor’s
compliance monitoring system or Superintendent’s reviews may be based on any of the following inspection methodologies:

a) 100% Asset inspection of the total population:

Under this inspection methodology the Management Board shall decide the frequency at which a 100% Asset inspection of the total population is undertaken.

Following the 100% inspection of the total population, the requirement for the demonstration of compliance with the specified minimum Contract Standard (CS%) is:

\[ P\% \geq CS\% \]  

where:
\[ Z = \text{the total number of units in the population} \]
\[ z = \text{the total number of units inspected that have no defects} \]
\[ P\% = \frac{z}{Z} \times 100 \]

Guidance Note: The following example should be reworked using data specific to the contract e.g. sub-network length, no. of lanes, etc.

The following example is provided for the avoidance of doubt:

For shoulder potholes the Contract Standard is defined as ‘No more than 5% of the number of 100m Sections with one or more defects’ so that CS% = 95%.

Sub-network 2 is 59.2 km in length with the total number of 100m Sections in the population \( Z = 59.2 \times 2 \times 10 = 1184 \).

From equation (a) the requirement for the demonstration of compliance becomes:

\[ \frac{z}{1184} \times 100 \geq 95\% \]

and rearranging for \( z \):

\[ z \geq 0.95 \times 1184 = 1125 \]

In this case, compliance with the Contract Standard means that at least 1125 of the 1184 - 100m Sections shall have no defects in terms of shoulder potholes at each inspection.

b) Statistically Significant Asset Sample

Under this inspection methodology the Management Board shall decide the size of a randomly selected sample from the total population, which the Management Board
Compliance Monitoring

considers will represent satisfactorily the total population. The Management Board shall also decide the frequency at which the inspection of the sample is undertaken.

The requirement for the demonstration of compliance with the specified minimum Contract Standard (CS%) is then determined in accordance with Equation (a) above, by substituting the sample population % properties for the total population properties.

Guidance Note: The following example should be reworked using data specific to the contract e.g. no. of lanes, etc.

The following example is provided for the avoidance of doubt:

Continuing from the example in a) for shoulder potholes the Management Board decides that a randomly selected 10 km of sub-network 2 is a statistically significant sample to represent the total population such that the total number of 100 m Sections in the sample population is $Z_s = 10 \times 2 \times 10 = 200$.

From Equation (a), the requirement for the demonstration of compliance becomes:

$$\frac{Z_s}{200} \times 100 \geq 95\%$$

and rearranging for $Z_s$:

$$Z_s \geq 0.95 \times 200 = 190$$

In this case, compliance with the Contract Standard means that at least 190 of the 200 - 100 m Sections shall have no defects in terms of shoulder potholes at each inspection.

c) Statistical Inference from Asset Sample

Using statistical inference the % compliance of the total population (P%) is estimated from the % compliance derived from a randomly selected sample from the total population (P%).

Under this methodology the Management Board shall decide the size of a randomly selected sample from the total population, however the sample is not necessarily required to be statistically significant. The Management Board shall also decide the frequency at which the inspection of the sample is undertaken.

As the sample properties generally do not exactly represent the properties of the total population a sampling error is considered. The larger the sample size the smaller the sampling error becomes and subsequently the closer the sample will represent the total population.
Compliance Monitoring

Through setting an upper and lower bound confidence limit to $P_s\%$, it is possible to predict a level of confidence, that $P\%$ falls within the bounds of $P_s\% \pm$ confidence interval. For the purpose of compliance demonstration an 85% confidence limit shall be used to set the width of the confidence interval.

For the Contractor's compliance monitoring system to demonstrate that $P\%$ is greater than $CS\%$ the lower bound of the 85% confidence limit must be shown to be above the $CS\%$ such that the criteria for compliance demonstration becomes:

$$P_s\% - 85%CL \geq CS\%$$  
\text{Equation (b)}

where:

- $Z_s$ = the total number of units in the sample
- $Z_s$ = the total number of units inspected that have no defects
- $P_s\%$ = sample % compliant = $\frac{Z_s - x}{Z_s} \times 100$

$85\% CL$ = the 85% Confidence Level $= 1.44 \times \sqrt{\frac{P_s\% (100 - P_s\%)}{Z_s}}$

and 1.44 is a constant which results from the assumptions of 85% confidence and the normal distribution of defects over the total population.

Guidance Note: The following example should be reworked using data specific to the contract e.g. sub-network length, no. of lanes, etc.

The following examples are provided for the avoidance of doubt:

Continuing from the example in a) for shoulder potholes, a sample of 150 of the 100m Sections ($Z_s$) are randomly selected from the total population of 1184 Sections. As a result it is found that 145 Sections ($Z_s$) have no shoulder potholes greater than 100mm in diameter or 50mm deep. From the sample results the % compliant ($P_s\%$) is determined as:

$$P_s\% = \frac{145}{150} \times 100 = 96.7\%$$

and the 85% Confidence Level (CL) as:

$$= 1.44 \times \sqrt{\frac{96.7 \times (100 - 96.7)}{150}} = 2.11\%$$

From Equation (b), the criteria for the demonstration of compliance:
Compliance Monitoring

96.7% - 2.11% = 94.56% < 95%

is not achieved so that compliance has not been demonstrated in this case.

To illustrate the effect of increasing the sample size to reduce sampling error now consider the a scenario where the sample size is doubled to 300 Sections (X₃) and the resulting % compliant (P₃%) is as previously at 96.7% due to 290 Sections (x₃) found to have no shoulder potholes greater than 100mm in diameter or 50mm deep.

The 85% CL becomes:

\[ = 1.44 \times \sqrt{\frac{96.7 \times (100 - 96.7)}{300}} = 1.49\% \]

From Equation (b), the criteria for the demonstration of compliance becomes:

96.7% - 1.49% = 95.17% > 95%

Clearly compliance has been demonstrated in this case.

Where the inspection procedure relies on statistical inference, a sufficient sample to permit the assumption of a normal distribution of defects over the total population is required.

Under the Superintendent's review to demonstrate non-compliance of the total population from a random sample using statistical inference the upper bound of the 85% CI must be below the % CS such that the criteria for non compliance demonstration becomes:

\[ P₃\% + 85\%CL \leq CS\% \]

Equation (c)

Guidance Note: The following example should be reworked using data specific to the contract e.g. sub-network length, no. of lanes, etc.

The following examples are provided for the avoidance of doubt:

Continuing from the example in a) for shoulder potholes, the Superintendent randomly selects 150 of the 100m Sections (Z₃) from the total population of 1184 Sections where his review finds that 145 Sections (z₃) have no shoulder potholes greater than 100mm in diameter or 50mm deep.

From the sample results the % compliant (P₃%) is determined as:

\[ P₃\% = \frac{145}{150} \times 100 = 96.7\% \]
5 Compliance Monitoring

and the 85% CL as:

\[ 1.44 \times \sqrt{\frac{96.7 \times (100 - 96.7)}{150}} = 2.11\% \]

From Equation (c), the criteria for the demonstration of non-compliance becomes:

\[ 96.7\% + 2.11\% = 98.81\% > 95\% \]

In the previous example (with the same \( z_s \) and \( Z_s \)) the Contractor was unable to demonstrate compliance, but the Superintendent’s review has not conclusively demonstrated that the total population is non-compliant. In this case a non-compliance notice would not be issued.

Now consider if six months following the previous audit the Superintendent performs another random 150 sample inspection however as a result of this audit only 135 sections \( z_s \) are found to have no shoulder potholes greater than 100mm in diameter or 50mm deep. From the sample results the % compliant \( P_s \%) \) is determined as:

\[ P_s \% = \frac{135}{150} \times 100 = 90\% \]

and the 85% CL as:

\[ 1.44 \times \sqrt{\frac{90 \times (100 - 90)}{150}} = 3.53\% \]

From Equation (c), the criteria for the demonstration of non-compliance becomes:

\[ 90\% + 3.53\% = 93.53\% < 95\% \]

In this case the Superintendent’s review has demonstrated the total population to be non compliant and a non-compliance notice would be issued.

5.4 Non-Compliance System

5.4.1 System Description

The system is based on non-compliance notices which may be issued by the Superintendent in two forms:

a) major non-compliance notice

b) minor non-compliance notice
5 Compliance Monitoring

Prior to issuing a major non-compliance notice the Superintendent must present the circumstances under which the non-compliance notice is to be issued to the Management Board.

Following such presentation the process to be followed defining the requirements for issue of the major non-compliance notice shall be defined by the flowchart in Appendix 5.1.

A non-compliance notice can only be closed by the Superintendent. The Contractor must demonstrate, to the satisfaction of the Superintendent, that the conditions required to close the non-compliance notice have been fulfilled.

The number and status of both types of non-compliance notice shall be reported at every meeting of the Management Board.

The Principal may, at its sole discretion, terminate the Contract if:

a) three major non-compliance notices are open at any time; or

b) a Key Performance Measure for which a major non-compliance notice has been issued in accordance with Maintenance Specification, Clause 5.4.2c) is not met within one year of the issue of the major non-compliance notice; or

c) the Contractor fails to perform the annual high speed data collection survey; or

d) the Contractor fails to perform the falling weight deflectometer survey in Years 3, 6, 8 and 10; or

e) as provided for elsewhere in the Contract.

5.4.2 Major Non-Compliance

The following describes the circumstances in which a major non-compliance notice may be issued and closed out:

a) Multiple minor non-compliance notices

- Issued – at any time when a total of five minor non-compliance notices, whether related or not, are open.

Following the issue of such a major non-compliance notice, any further minor non-compliance notices that are issued shall contribute towards another major non-compliance notice regardless of whether any of the five minor non-compliance notices making up the preceding major non-compliance notice have been closed out.

- Closed out – when all five minor non-compliance notices comprising the major non-compliance notice have been closed out and the Performance Criteria to
Compliance Monitoring

which those minor non-compliance notices relate have been maintained for one year.

b) Failure to complete surveys

- **Issued** — when the Contractor has failed to complete the benchmarking surveys within the timeframes specified in Maintenance Specification, Clauses 5.2.2 and 5.2.3 or failed to complete the compliance surveys within the timeframes specified in Maintenance Specification, Clause 3.1.

An additional major non-compliance notice may be issued for every two months a survey has not been completed following the issue of the initial major non-compliance notice.

- **Closed out** — when the Contractor has presented the survey report to the Management Board and the Management Board has accepted the results.

c) Failure to deliver survey reports

- **Issued** — when the Contractor has failed to deliver the Benchmarking or Compliance Reports within the timeframes specified in Maintenance Specification, Clause 3.1.

An additional major non-compliance notice may be issued for every two months a report has not been completed following the issue of the initial major non-compliance notice.

- **Closed out** — when the Contractor has presented the report to the Management Board and the Management Board has accepted the results.

d) Failure to meet Key Performance Measures

- **Issued** — when the Contractor has failed to meet a Key Performance Measure by a margin greater or equal to that listed in Table 5.4.1.

Separate major non-compliance notices may be issued for every Key Performance Measure not met in each sub-network. For example, if the Roughness – Mean NAASRA Key Performance Measure is not achieved by a margin greater than the specified 2 NAASRA for both sub-networks 1 and 2, the Superintendent may issue two major non-compliance notices following the procedure specified in Maintenance Specification, Clause 5.4.1.
Compliance Monitoring

### Table 5.4.1: Major Non-Compliance Tolerances for Key Performance Measures

<table>
<thead>
<tr>
<th>Key Performance Measure</th>
<th>Tolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roughness – Mean NAASRA</td>
<td>&lt;&lt;2&gt;&gt; NAASRA</td>
</tr>
<tr>
<td>Roughness – Percent with Roughness &gt; NAASRA Threshold</td>
<td>&lt;&lt;1.00&gt;&gt;%</td>
</tr>
<tr>
<td>Texture – Minimum Mean Texture Depth</td>
<td>&lt;&lt;0.20&gt;&gt;mm</td>
</tr>
<tr>
<td>Texture – Percent with Mean Texture Depth &lt; Threshold</td>
<td>&lt;&lt;0.20&gt;&gt;%</td>
</tr>
<tr>
<td>Texture – Requirement to Treat Surface Texture</td>
<td>&lt;&lt;0&gt;&gt;</td>
</tr>
<tr>
<td>Skid Resistance – Percent with SFC &lt; Threshold</td>
<td>&lt;&lt;1.00&gt;&gt;%</td>
</tr>
<tr>
<td>Skid Resistance – Requirement to Treat Surface Skid Resistance</td>
<td>&lt;&lt;0&gt;&gt;</td>
</tr>
<tr>
<td>Rutting – Percent with depth &gt; 20mm</td>
<td>&lt;&lt;0.25&gt;&gt;%</td>
</tr>
<tr>
<td>Surfacing – Minimum Annual Resurfacing Length</td>
<td>&lt;&lt;10&gt;&gt;%</td>
</tr>
<tr>
<td>Structural Condition – Structural Condition m³ Overlay</td>
<td>&lt;&lt;3&gt;&gt;%</td>
</tr>
<tr>
<td>Structural Condition – Minimum Annual Rehabilitation Length</td>
<td>&lt;&lt;10&gt;&gt;%</td>
</tr>
</tbody>
</table>

- Closed out – when the Contractor has demonstrated to the satisfaction of the Superintendent that the Key Performance Measure has been met and, for the avoidance of doubt, not merely brought back within the tolerance specified in Table 5.4.1.

### 5.4.3 Minor Non-Compliance

A minor non-compliance notice may be issued in the following circumstances:

a) **Failure to meet Management Performance Measures**

- Issued – when the Superintendent determines that the Contractor has failed to comply with a Management Performance Measure Contract Standard or Delivery Time, other than Benchmarking or Compliance Reports.

Separate non-compliance notices may be issued for each occasion of late delivery and for each instance of non-compliance with the Contract Standards, for any meeting, report, management plan or for any quality control, asset management, resource management planning, network control or communications function.

A separate minor non-compliance notice may be issued for every month the Management Performance Measure remains in non-compliance.
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- Closed out – when the Contractor’s compliance monitoring system and any audits performed by the Superintendent indicate that the Management Performance Measure is met.

b) Failure to meet Key Performance Measures

- Issued – when the Contractor has failed to meet a Key Performance Measure by a margin less than that listed in Table 5.4.1. A minor non-compliance Notice may be issued in respect of a Key Performance Measure for which a major non-compliance Notice is already open.

Separate minor non-compliance notices may be issued for every Contract Standard not met in each sub-network and for each year of non-compliance.

- Closed out – when the Contractor has demonstrated to the satisfaction of the Superintendent that the Key Performance Measure has been met.

c) Failure to meet Operational Performance Measures

- Issued – when the Superintendent determines, by inspection of the Assets, that the Contractor has failed to comply with a Contract Standard or Response Time of an Operational Performance Measure.

In the event of continuous non-compliance with respect to a Contract Standard, a separate minor non-compliance notice relating to a particular Operational Performance Measure may be issued every two months the same Operational Performance Measure remains non-compliant.

In the event of continuous non-compliance with respect to a Response Time, a separate minor non-compliance notice relating to a particular Operational Performance Measure may be issued each time the Response Time is again exceeded prior to a particular Defect being rectified.

- Closed out – when the Contractor’s compliance monitoring system and any inspections performed by the Superintendent indicate that the Contractor has complied with the Operational Performance Measure for a continuous period of six months.

d) Failure to rectify system failure

- Issued – when the Superintendent determines, by inspection of the Contractor’s compliance monitoring system that systematic corrective action has not been implemented to rectify self-determined recurring non-compliance with the Performance Criteria.
5 Compliance Monitoring

A separate minor non-compliance notice may be issued for every two months the systematic failure is not rectified.

- Closed out – when the Contractor has rectified the systematic failure.
Appendix H

Research Conclusions from Mini-Scan Study

Exhibit H.1 – Contract Matrix
Table created during research in MS Word.
<table>
<thead>
<tr>
<th>Domestic</th>
<th>International</th>
<th>Contracting Began</th>
<th>Contract Style</th>
<th>Contract Value (Avg.)</th>
<th>Contract Length (Center-line or lane miles)</th>
<th>Contract Duration</th>
<th>Payment Style</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chapter 2 – NCDOT (Charlottesville Pilot Project Version 1)</td>
<td>Chapter 5 - Australia</td>
<td>2007</td>
<td>Corridor</td>
<td>~$23 million</td>
<td>131 center-line</td>
<td>7 years</td>
<td>Lump Sum</td>
</tr>
<tr>
<td>Chapter 4 - FDOT (Asset Maintenance Contract)</td>
<td>Chapter 7 - New Zealand (PSMC)</td>
<td>2000</td>
<td>Area/Corridor/Facilities</td>
<td>~900 million in total contracts, $129 mil annually.</td>
<td>1&quot; contract – ~254 center-line miles</td>
<td>7 to 10 years w/ extensions no longer than org. duration</td>
<td>Lump Sum – Payment Schedule Used.</td>
</tr>
<tr>
<td>VDOT (I-64 TAMS contract)</td>
<td></td>
<td>1997-1998</td>
<td>Corridor</td>
<td>~16.3 million</td>
<td>~87 center-line miles</td>
<td>5 years w/ possible extension</td>
<td>Lump Sum</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1996-2011</td>
<td>Corridor</td>
<td>n/a</td>
<td>n/a</td>
<td>10 year fixed term</td>
<td>Cost-plus</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2011 – n/a</td>
<td>Area-wide</td>
<td>n/a</td>
<td>2,275 km (~*1,414 center-line miles)</td>
<td>5 to 7 years w/ potential extension</td>
<td>525</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(large)</td>
<td></td>
<td>300 km (~186.4 center-line)</td>
<td>10 year fixed term</td>
<td>525</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2000 – 2015</td>
<td>Corridor</td>
<td></td>
<td>n/a</td>
<td></td>
<td>525</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Area-wide</td>
<td></td>
<td>n/a</td>
<td></td>
<td>525</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Corridor</td>
<td></td>
<td>n/a</td>
<td></td>
<td>525</td>
</tr>
</tbody>
</table>

### Additional Notes

- **Term Network Contracts**: VDOT
- **Integrated Services Arrangements**: VDOT
- **Target Price for capital works**: PSMC 007 West Waikato
- **Lump Sum**: Routine and Periodic Maintenance

---

**Contracting Began (Performance Program)**

- 2007
- 1999-2000
- 2000
- 1997-1998
- 1996-2011
- 2011 – n/a
- 1998

**Contract Style**

- Corridor
- 6202-14-001 – Corridor
- Area/Corridor/Facilities
- Corridor
- Area-wide (large)
- Corridor

**Contract Value (Avg.)**

- ~$23 million
- ~19.6 million
- ~900 million in total contracts, $129 mil annually.
- 1" contract – 73.5 million
- ~16.3 million
- n/a
- n/a
- July 2010 A-one+ started the new Area 14 contract worth £147 million over 5 years, following the previous successful 7 year contract as A-one.
- PSMC 007 West Waikato Waikato & Bay of Plenty - Hamilton office
- Date awarded: Jul 2011
- Estimated value: $125,000,000.00

**Contract Length (Center-line or lane miles)**

- 131 center-line
- ~115 center-line
- 1" contract – ~254 center-line miles
- ~87 center-line miles
- n/a
- 2,275 km (~*1,414 center-line miles)
- 300 km (~186.4 center-line)
- n/a

**Contract Duration**

- 7 years
- 3 years + 2
- 7 to 10 years w/ extensions no longer than org. duration
- 5 years w/ possible extension
- 10 year fixed term
- 5 years + 1 +1 +1.... term dependent on performance
- 5 to 7 years w/ potential extension
- 10 year fixed term

**Payment Style**

- Lump Sum
- Lump Sum
- Lump Sum – Payment Schedule Used.
- Lump Sum
- Lump Sum
- Cost-plus
- Target Price for capital works
- Lump Sum: Routine and Periodic Maintenance

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525
### Area #1 - Parameters – Scope of Services

<table>
<thead>
<tr>
<th>Periodic Maintenance</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine Maintenance</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Capital Works</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes, up to $1.5 Mil</td>
<td>Yes, up to $3.0 mil</td>
<td>Yes, up to $750K increasing by 2.5% each year of term.</td>
<td>Yes, up to $400k</td>
</tr>
<tr>
<td>Traffic Operations</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Timeliness Requirements</td>
<td>Yes</td>
<td>Yes (No formal list in contract)</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes, RIMPs (Intervention parameters)</td>
<td>Yes</td>
<td>Yes, API Handbook includes</td>
<td>Yes</td>
</tr>
<tr>
<td>Alliencing or Partnering used</td>
<td>Yes – use of Partnering Charter</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>Yes – Alliencing</td>
<td>Partnering via Network Board</td>
<td>Partnering via Management Team</td>
</tr>
</tbody>
</table>

### Area #2 – Performance Assessment

<table>
<thead>
<tr>
<th>Evaluation Program</th>
<th>Yes – Maintenance Condition Assessment (MCA)</th>
<th>Yes – TxMAP program</th>
<th>Yes – MRP program</th>
<th>Yes – MRP program</th>
<th>Yes, Multi-level</th>
<th>Yes, Multi-level</th>
<th>Yes, 3 areas of measure (assets, management, operations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nomenclature</td>
<td>Components/Elements</td>
<td>Components/Elements</td>
<td>Elements/Characteristics</td>
<td>Asset Groups/Asset Items</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Evaluation Frequency</td>
<td>Every 6 months</td>
<td>Monthly Inspections</td>
<td>MRP – 3x per year</td>
<td>Up to 3 but no less than 3 in 12 months</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Amper – 2x per year</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evaluation done by......</td>
<td>Agency</td>
<td>Agency</td>
<td>Agency</td>
<td>Agency</td>
<td>Contractor; Agency audits</td>
<td>Contractor; Agency audits</td>
<td>Contractor; Agency audits</td>
</tr>
<tr>
<td>------------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>---------------------------</td>
<td>---------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>3rd Party Auditor</td>
<td>n/a</td>
<td>No, TxDOT conducts own evaluations</td>
<td>No, FDOT conducts own evaluations</td>
<td>Yes</td>
<td>Agency/Consultant</td>
<td>Yes, PEG group</td>
<td>Agency/Consultant</td>
</tr>
<tr>
<td>Key Performance Indicators (KPI’s)</td>
<td>No mention of use at the project level.</td>
<td>No mention of use at the project level.</td>
<td>Yes, 47 standard Indicators used by AMPER + 7 project specific</td>
<td>No, only indicators are for MRP.</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Evaluations use Pass/Fail or other Criteria</td>
<td>Yes</td>
<td>TxMAP Scale 1 thru 5 criteria</td>
<td>Yes/No</td>
<td>Yes</td>
<td>Some; others uses ranges</td>
<td>Some; others uses ranges</td>
<td>Some; others uses ranges</td>
</tr>
<tr>
<td>Area #3 – Any Results</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Cost per lane mile or km</td>
<td>$8000 per LM vs. $6000 per LM (Traditional)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
</tr>
<tr>
<td>Cost Savings</td>
<td>None reported.</td>
<td>Rest Areas large increase in service levels; attributed to incentives. 6202-14-001 – Increase Service Other Districts – LOS fluctuations</td>
<td>~15%</td>
<td>n/a</td>
<td>At least 35%</td>
<td>Not determined yet. Still letting these contracts.</td>
<td>At least 10%</td>
</tr>
<tr>
<td>Level of Service (Up or Down)</td>
<td>Variable levels, version 2 contract better results</td>
<td>Better Snow and Ice control services than state forces reported.</td>
<td>Increase</td>
<td>Increase</td>
<td>Increase</td>
<td>No evaluations until ~2015</td>
<td>Increases and Innovations on the network.</td>
</tr>
</tbody>
</table>