AMOTIA

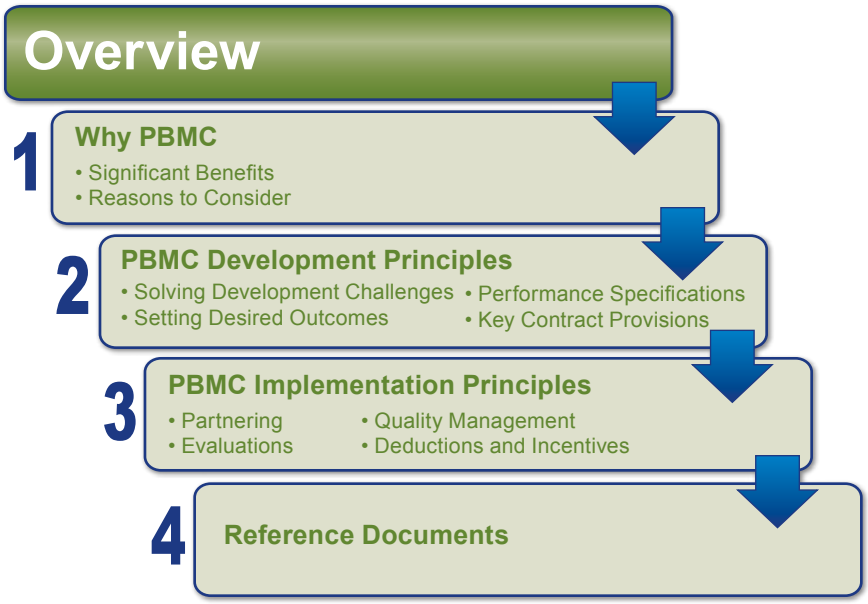
Association for the Management and Operations of Transportation Infrastructure Assets

Performance Contracting Guide

Focus on Key Principles

for Development and Implementation

An Overview to the Guide



Overview: This overview introduces *The AMOTIA Performance Contracting Guide* (AMOTIA Guide #20 – Focus on Key Principles for Development and Implementation) and describes the intended use. *The AMOTIA Performance Based Maintenance Contracting Guide* (AMOTIA Guide #10) published in 2008 established definitions and strategic guidelines for performance based contracting. This guide, AMOTIA Guide #20, focuses on the key principles for development and implementation of successful performance based maintenance programs.

The guide is presented in a compact and concise format with three main sections:

- Why PBMC
- PBMC Development Principles
- PBMC Implementation Principles

The guide uses contractual language drawn from three public agencies that successfully implemented PBMC – the Florida and Virginia Departments of Transportation and the Ontario Ministry of Transportation.

Who Should Use the Guide: The Guide is intended to be a helpful tool widely used by the transportation industry. The principles described are universally adaptable to all transportation agencies. The targeted audience should include executives and practitioners.

For the Executive: The decision to develop and implement a PBMC must be led by top management. The Guide provides a ready tool for executives to heighten their awareness of the key principles for success.

For the Practitioner: The content and application of the principles in the Guide will assist the professionals most responsible for developing the agency policies and procedures necessary for implementing the PBMC. The Guide was constructed to focus on the principles; consequently, it will provide practitioners with a useful roadmap in the development of their programs.

Reference Documents: There is an extensive library of information published on performance based maintenance in the form of transportation agency documents, presentations by noted industry practitioners and research papers. A listing of the most useful documents is included at the end of this Guide with hyperlinks to the source for ease of access.

1 WHY PBMC

Performance Based Maintenance Contracting (PBMC) is a contractual process in which payments for the management and maintenance of transportation infrastructure assets are directly linked to the contractor successfully meeting or exceeding certain clearly defined minimum performance indicators or measures. PBMC is different from the traditional method of contracting maintenance services in which the work method is specified and the owner agency directs the activities.

PBMC is Different from Traditional Contracting

For example, the contractor is not paid for the number of potholes patched, but for the outcome of the work: *no pothole remaining open (or 100% patched).*

If the contractor is compliant with the performance measures, then the contract payments are regularly made, usually in equal monthly installments.

Failure to comply with the performance measures, or to promptly correct identified deficiencies will reduce the contractor's payment through a series of clearly defined deductions.

1.1 SIGNIFICANT BENEFITS TO OWNER

In the last two decades, performance based maintenance contracting has evolved to a level of maturity that has resulted in significant benefits to the owner. These benefits in both the short and long term include:

- A fixed long term price to provide for budget certainty,
- Reduced unit costs leading to cost savings,
- Increased contractor accountability to ensure outcomes are met,
- Flexibility to implement innovative materials, techniques and equipment leading to increased asset life,
- Better risk allocation reducing owner exposure, and
- Clearly defined measurable levels of service.

The significant benefits of primary concern to the owner center on better risk allocation, efficiency in raising levels of service, and reduced unit costs.

1.1.1 Better Risk Allocation

There is strategic long-term importance in the appropriate allocation of risk between the agency and the contractor. Typical risks associated with maintaining system assets range from price fluctuations, varying stakeholder and user demands, changing or unknown workload quantities, major storm/catastrophic events, and third party damage to system assets. The correct allocation of risks between the owner and the contractor will ensure the most efficient management of the risks, which ultimately results in cost efficiencies.

AMOTIA Performance Based Maintenance Contracting Guide (PBMC Guide #10 describes the benefits associated with appropriate risk allocation (Ref #1). Guide #10 succinctly describes an example under traditional maintenance contracting where the owner identifies damage to a downed sign, prepares a work order and monitors the contractor's repair. With PBMC, the contractor is charged with the responsibility to monitor system conditions, detect the downed sign, and correct the deficiency without any action by or additional cost to the owner.

The appropriate allocation of risk places responsibility with the contractor for achieving the desired outcomes, and provides flexibility to the contractor, thereby opening up opportunities to improve the efficiency and effectiveness of the maintenance processes.

1.1.2 Efficiency in Raising Levels of Service

The maintenance practitioner with daily responsibility for agency assets is most concerned with ensuring that customer demands for a specified level of service are met in a responsive manner. The experience of PBMCs in efficiently raising levels of service has been documented by the Transportation Research Board in NCHRP Synthesis 389, Performance-Based Contracting for Maintenance (Ref #2). Two examples are shown in the Table, right.

Two Examples of Raised Service Levels

In 1998, the District of Columbia Department of Public Work awarded a PBMC for maintaining 75 miles of roads. The District defined approximately 170 performance measures to reflect levels of service and the contractor's overall performance. After the first year, performance rose from the high 20s to the low 80s (out of 100).

In 2000, the Texas Department of Transportation outsourced the rehabilitation and maintenance of rest areas utilizing 2-year performance based maintenance contracts. For measuring the conditions of the facilities, TxDOT established an evaluation process. At the beginning of the program, rest areas scores averaged 73%. At the end of the first year, average statewide ratings of facilities increased from 73% to 91%. (Ref #5)

Several agencies learned the importance of having a process that quantifies levels of service. One such process used by highway agencies is called the Maintenance Rating Program (MRP) or the Maintenance Condition Assessment (MCA). The MRP/MCA process is one that provides accurate information and effectively communicates quantitative measures of the level of service achieved. (Ref #3)

As an example, the Virginia Department of Transportation (VDOT) uses the MRP process on a regular basis to evaluate the entire interstate network to determine whether the contractor has met the minimum performance indicators. These evaluations are important to VDOT since they provide a comprehensive snapshot of the conditions of the highways and allow VDOT to identify deficiencies in the maintenance service. (Ref #4)

Reducing Unit Costs Lead to Cost Savings

For example, as the contractor creates efficiencies in its organization and operations, the contractor lowers its unit costs in performing maintenance activities that can be transferred in terms of cost savings on subsequent contracts. This has been documented by New Zealand Authorities. (Ref #7)

1.1.3 Reduced Unit Costs Lead to Cost Savings

Many owner agencies utilizing performance based maintenance contracts have documented significant cost reductions (and savings) in the delivery of maintenance services while maintaining or improving asset condition. Several national and international sources report cost savings that range from over 10% for highway assets associated with the interstate systems, to as high as 40% for less developed road systems.

The World Bank in Transport Note #27, Performance based Contracting for Preservation and Improvement of Road Assets, provides a comparative analysis of the cost savings among different systems in the United States, Australia, Canada and New Zealand, among others. (Ref #6)

Significant cost reductions were observed through repeated contracting cycles as contractors identified new and more cost efficient methods for providing the maintenance services. The incentive to test and apply new technologies and optimize resource allocation increases for longer multi-year performance based maintenance contracts.

1.2 OTHER REASONS FOR CONSIDERING PBMC

Other reasons for considering performance based contracts were observed in the areas of application of new and more efficient technologies, achieving increased budget certainty, reductions in long term agency overhead costs associated with employee health care and pension funding, streamlined administrative procedures, reductions in fixed facilities and equipment fleet requirements.

1.2.1 Incentives to Innovate with New Technologies

The PBMC approach provides an incentive to test and apply new technologies and optimize resource allocation given the longer term of multi-year performance based maintenance contracts; and productivity gains, in turn, are driven by the application of these new technologies.

Example of Technology Gains:

Under a PBMC for the Orlando-Orange County Expressway Authority toll roadways, the contractor replaced conventional steady-burn amber signal bulbs with flashing amber LED bulbs at the approach barriers to the toll plaza lanes. The advancement in technology was a quadruple gain.

First, the flashing LED bulbs increased asset performance by increasing motorist visibility with the change in the burn cycle, and by having a longer bulb life which provides fewer disruptions to the toll plaza functionality.

Second, the LED bulbs utilize less energy than conventional bulbs, thereby reducing the cost of electric utilities for the Authority.

Third, the reduction in energy usage reduces the environmental footprint of the plaza and promotes the environmental awareness of the Authority.

Finally, the higher performing LED bulbs reduce the occurrence of repair and replacement, which reduces both the maintenance costs and disruptions in service to the users of the plaza lanes.

1.2.2 Achieving Budget Certainty

The lump sum nature of performance based contracts generates a fixed budget schedule facilitating the agencies' funding strategies over a longer term.

1.2.3 Reduced Agency Overhead Costs

Budget reductions, hiring freezes and attrition all contribute to a shortage of specialized personnel within an organization. Furthermore, owner agencies may be reluctant to hire specialized personnel and incur long-term salary costs and retirement costs for specific term projects. Performance based contractors fill this void by providing trained and competent staff at a competitive rate and only for the time that this staff is needed on the project.

1.2.4 Streamlined Agency Administrative Procedures

Traditional maintenance contract administration includes daily inspections; measurement, recording and tracking of all units accomplished; reconciliation of quantities; and processing detailed monthly invoices. PBMC passes most of this administration to the contractor, who is now responsible for accomplishing all necessary activities to meet the performance measures. The role of the owner agency is streamlined from one of managing maintenance tasks to one of monitoring whether the specified outcomes are met. This change allows the owner agency to focus on managing the contract to guarantee the quality of the end product. The contractor may perform all measurements, recording, and tracking and can provide this data to the owner.

1.2.5 Reduced Requirements for Fixed Facility and Equipment Fleet

A significant reduction in agency fixed costs has been achieved with the implementation of PBMC. Florida, Virginia and Ontario have closed maintenance yards throughout their state in addition to transferring ownership of others. The equipment fleets have also been substantially reduced. The elimination of these kinds of fixed costs provides both reduced capital expenditures and reduced operational expenditures.

2 PBMC DEVELOPMENT PRINCIPLES

Developing a PBMC is a team-based, iterative process, and this process should follow key PBMC development principles. By following these principles, the development team can formulate a contract that has internal agency/staff support, good contractor interest and support, and that adequately describes a reasonable set of desired outcomes for the contract - all of which are key factors for success. The development principles covered in this section include:

- Solving Development Challenges
- Setting Desired Outcomes
- Performance Specifications
- Sound Contract Principles

2.1 SOLVING DEVELOPMENT CHALLENGES

Challenges that can become obstacles to developing a PBMC program. These obstacles can be solved. There is a library of information to draw on that is available from other agency experiences in meeting development challenges. Solving development challenges includes:

- Establishing an agency vision for PBMC,
- Ensuring support from elected officials,
- Gaining contracting community confidence,
- Ensuring agency staff are knowledgeable of PBMC principles, and
- Identifying a staff team dedicated to accomplishing the vision.

2.1.1 Establishing Agency Vision for PBMC

The most important development principle is to have a clearly established agency vision for the PBMC program. The vision must be easily communicated and readily understood. It must drive the program in overcoming obstacles during development and setting goals that are realistically achievable during implementation.

2.1.2 Gaining Stakeholder Confidence

The agency needs the confidence of its key external stakeholders – including the legislature and the contracting community – to move the development process to implementation. Communicating the vision and the desired results are instrumental in achieving this confidence. Industry sources such as AMOTIA, have materials and information to facilitate stakeholder knowledge of PBMC concepts.

Georgia Vision for PBMC

GDOT vision is to procure a contractor who can optimize performance while providing effective management oversight of all of the requested services (asset management of I-95 Interstate system) in a creative and feasible manner.

2.1.3 Ensuring Agency Staff are Knowledgeable of PBMC Principles

Key principles for development and implementation must be clearly communicated to agency staff. Some employee roles and responsibilities will dramatically change with PBMC. New skills are required and training is critical to acquiring these skills. The AMOTIA website has information and guidance to assist with staff training.

2.1.4 Identifying Staff Team to Accomplish the Vision

A team dedicated to accomplishing the vision is critical to success. A team drawn both from the central office, district offices and the field will provide the appropriate mix of development and implementation skills. This team should be involved with preparing the detailed development and implementation policies and procedures. The team should be provided with the library of information available on PBMC, and ideally have the opportunity to interact with other agencies that have PBMC programs, such as Transportation Departments in Florida, Virginia, North Carolina and Georgia or toll agencies such as Florida Turnpike Enterprise or North Texas Toll Authority.

2.2 SETTING DESIRED OUTCOMES

The maximum benefits to be obtained in implementing a PBMC program are usually measured by the success in controlling costs within the framework of achieving the desired outcomes. In other words, the agency should specify levels of service that are in line with budget limitations if it is to achieve a desired cost outcome.

2.2.1 Setting Desired Level of Service

Each agency must determine the current and the desired level of service for their system; and each must evaluate the level of service being provided per roadway classification, and whether this meets the legislature's and the public's needs. The desired levels of service should be reasonable or the bid prices will be excessive.

The agency can begin to determine the appropriate level of service and performance specifications by reviewing those from other successful agencies. AMOTIA prepared an easy-to-use guide of comparative measures that will be of assistance in this review. (Ref #8) Each roadway classification may have differing performance specifications; however, assets that provide for public safety typically have equal performance specifications regardless of roadway classification.

2.2.2 Setting Budget Expectations

Most agencies have a database of historical budget expenditures and actual unit prices from outsourced and self-performed work for each maintenance activity that is typically specified in a PBMC. From this data, the agency can develop reasonable budget expectations to be met with the PBMC. A typical "pitfall" to avoid is setting budget expectations that are not in line with the desired level of service. As an example, if the desired level of service is substantially increased over historical levels, then one would expect the budget expectations to also increase or vice versa.

Many agencies have used PBMC to achieve cost savings over historic in-house expenditures. These savings were achieved where budget levels are aligned with the performance measures, and the competitive bidding process lowers prices over time as contractors implement their innovative management and technical processes.

2.2.3 Baseline and Handover Conditions

A baseline condition assessment is critical to improve the accuracy of the engineer's estimate and decreases risk in the contractor's offer. A handover or turnover condition assessment is also critical to identify gaps in maintenance services prior to contract completion. The owner agency must follow a systematic approach when conducting a baseline or handover condition assessment. The results of these two assessments show whether the maintenance levels of service have improved, stayed the same, or decreased at the end of the contract period.

The owner agency should consider performing a closeout inspection several months before the end of the contract in order to prepare a list of all the necessary repairs and corrections, including any measures needed to achieve asset residual life spans required by the contract.

2.3 PERFORMANCE SPECIFICATIONS – FOUNDATION OF PBMC

A performance based approach specifies the outcomes of the work without indicating what materials, methods, or quantities are required to perform the work. The contractor determines what work should be done, how it should be done, and when it should be done.

Desired outcomes must be measurable in order to assess the contractor's level of performance or compliance with the desired outcomes. Performance specifications contain the parameters that define the outcomes and the standards against which the contractor is measured.

2.3.1 Performance Measures

A performance specification can have several parameters and agencies often approach the composition of specifications differently. However, the main parameter of a performance specification is the performance measure. A performance measure should provide a scale of measurement that can be used as the basis for determining contractor performance.

The most commonly used performance measures use either a condition measurement or a time measurement. Examples of both are provided in Table 1 on the next page.

Different Performance Measures

There are different approaches to determining the appropriate scale of measurement to use. Most are either **condition** based or **time** based. These are easily understood and measurable.

Some agencies use more subjective measurements such as a pass/fail or a measurement such as a 1 to 10 rating subjectively applied by the evaluator.

2.3.2 Developing Performance Specifications

Many performance specifications are readily available for guidance and potential adaptation to each agency's requirements.

AMOTIA compiled a comparative analysis of performance measures from five agencies that have procured PBMC contracts in 2010 and 2011. (Ref #8)

Industry Guidance on Performance Measures*

The importance of appropriate and objectively measurable performance standards for a successful PBMC cannot be over emphasized. It is recommended that GDOT use performance measures they currently have in place, and establish additional measures as needed to clearly convey the performance requirements GDOT desires. Once the performance standards are established, it is essential that an initial condition assessment of all the asset features included within the project scope be assessed. This assessment will give GDOT and prospective contractors a clear understanding of the relative condition of the asset and how the asset scores relate to the proposed performance standards or level of service (LOS).

It is recommended that GDOT seek industry input on the recommended standards before finalizing the standards that will be a part of the contract. This input will help determine the viability of particular standards and identify any unexpected budgetary ramifications.

It is important to understand that raising the overall level of service on a particular asset group or individual asset will impact costs. If the desired LOS exceeds the current level of service of the asset, obviously it may result in a higher overall cost to the GDOT. This will be important as the GDOT compares the PBMC contract costs to existing costs.

** Official AMOTIA position as presented to the Georgia Department of Transportation, 2007.*

Table 1 – Example Performance Measures

Condition Based Performance Measures: A condition-based measure assesses the physical distress or condition of an asset. The performance criteria describes severity and extent or a quantitative figure that illustrates the acceptable level of physical distress. The following example demonstrates a condition-based measure.

Example #1 - Shoulders: Shoulders must allow drivers to recover after driving over the edge of the roadway and, in order to perform as intended, for example, the shoulder drop-off at the edge of the roadway should not be greater than 2 inches. There should not be any presence of water along the shoulder.

Asset	Outcome	Performance Measure
Unpaved Shoulders	Safe Smooth Functional	• No potholes / shoulder failures. • <105 linear feet (10% of site) edge drop off high or low >1 ½". • No false ditch on shoulder that causes or could cause water to stand on shoulder or drain onto the travel lanes. • No erosion >2" deep.

Source: Turnkey Asset Maintenance Scope of Services, Virginia Department of Transportation, 2010

Time Based Performance Measures: Time based performance measures are generally used where safety is the primary concern. A time-based performance measure stipulates the maximum acceptable period for correction of a deficiency or non-compliance with an agency specification. The time is measured from the time of identification of the deficiency, to the time the correction is completed. Two examples are provided below which show how two different agencies approached the same performance measure.

Example #1 – Guardrail Repairs - Florida: Guardrails that are damaged by accidents, until repaired, pose a high safety risk. As such, specified timeliness requirements are necessary. Florida's approach is provided in the example below for the metro area interstate system around Jacksonville.

Asset	Outcome	Performance Measure
Guardrail	Temporary mitigation followed by permanent repairs	• Arrive at accident scene within 30 minutes of notification • Temporary mitigation: Must secure with proper MOT before leaving the site (within 90 minutes of accident) • Permanent repair within 10 calendar days of incident

Source: Asset Maintenance Scope of Services Dist 2 RFP, Florida Department of Transportation, 2011

Example #2 – Guardrail Repairs - Georgia: Georgia's approach is provided in the example below for I-95, a largely rural interstate system from border to border.

Asset	Outcome	Performance Measure
Guardrail/ Cable Rail/Impact Attenuators	Timely Efficient Effective Safe	• Damaged, nonfunctional guardrail and cable rail must be repaired within 7 days following notification or discovery. • Damaged impact attenuators must be repaired/replaced within 30 days following notification or discovery. • Damaged but functional guardrail must be repaired/replaced within 30 days following notification or discovery.

Source: Comprehensive Maintenance Services I-95, Georgia Department of Transportation, 2011

2.4 KEY CONTRACT PROVISIONS

Key contract provisions are identified in this section along with a discussion of recommendations and guidelines to improve the overall quality of the bidding documents. There are many lessons learned from the implementation of PBMC in other agencies some of which are included in this discussion. A detailed guideline on developing contract documents was prepared by AMOTIA and is available as a reference source. (Ref #9)

2.4.1 Scope of Services

Inclusion of as many routine maintenance and operational activities in the contract as possible is recommended. The bundling of activities helps to obtain lower costs based on larger work volumes, as well as distributing fixed contractor operational costs.

The bundling of many activities in the contract increases contractor accountability for the entire system, in addition to removing overlapping conflicts with other stakeholders that may otherwise have responsibilities within the contract limits.

Complete Fence-to-Fence Scope of Services

This would include all routine maintenance activities, service patrols, highway lighting maintenance, bridge inspection and maintenance, incident management, pavement management, minor improvement, and restoration work, as appropriate.

2.4.2 Performance Bonding

Requiring a performance bond in an amount equal to a percentage of the annual contract amount, in lieu of the multiple year total full contract amount, is strongly supported by the surety industry. This practice is used by other agencies for long-term maintenance contracts and will result in cost savings for the agency through lower performance bonding cost requirements.

The Contractor can be required to provide a performance bond for the annual amount no less than 45 days prior to the anniversary of the original contract execution to ensure continuous bonding of performance throughout the entire multiple year contract duration. Surety companies have required language to state that regardless of the number of annual extensions provided by a surety, total liability under each bond shall be limited to the face amount of the bond and shall only be applicable to the year for which the bond was provided.

2.4.3 Contract Award

There are two common approaches used by agencies for contract award – best value and two-step selection. The first approach, commonly called best value, considers the contractor's ability and approach to a particular project (technical proposal), as well as the price. In this approach, the technical proposal is evaluated and scored against preset evaluation criteria. The technical scores are assigned a weight (up to 70%) and the price is assigned a weight (up to 30%). Then the contractor with the highest combined score is awarded the project. This method allows the individual contractors to demonstrate their experience and expertise, and incorporate innovation into their project approach to earn a higher technical score.

Ultimately, it is the agency's decision on how much value the individual experience or innovative approaches bring to the project as the technical review members will have the option to award additional points for desirable characteristics. This selection process allows for innovative approaches to accomplishing the work while preserving the true best value for the agency.

The second approach, commonly called a two-step selection, is to first qualify contractors based upon scoring of a technical proposal. All contractors qualified as a result of meeting a minimum technical score are qualified to submit a price for the project. The responsive contractor with the lowest price is then awarded the contract.

2.4.4 Contract Term

The original contract duration should be a minimum of five years. It is even more advantageous to set the initial contract period for seven to ten years and include contract renewal options. By extending the duration of the contract and utilizing renewal options, benefits will be recognized in cost savings, the quality and timing of long-term repairs, and the guarantee of fixed costs spread over a longer term. A long-term contract is the best way to ensure that the contractor and owner are in alignment, as the contractor must live with the work they perform year in and year out.

Advantages of Renewal Options

The use of long-term contracts with renewal options also benefits the agency in that the maintenance costs over long periods of time (possibly 10 to 20 years) are fixed and known from the beginning of the contract period. Typically, agencies include an established inflation factor in the contract for the renewal period for use when the renewal option is exercised.

Extending the duration of the contract results in cost savings through several different means. First, the contractor and subcontractors have longer-term revenue commitments allowing them to acquire and depreciate equipment and facilities, where under a shorter contract duration they would have to rent or lease the equipment or facilities at a higher cost. Subcontractors will also benefit from long-term contracts and provide better prices.

The sustained performance required by a long term PBMC will empower and encourage the contractor to invest in long-term system preservation techniques and materials. An example would be the decision to replace existing painted traffic striping with higher cost thermoplastic striping material in order to ensure long term performance and durability, as well as higher traveler satisfaction and less disruption to traffic.

2.4.5 Emergency Response

Emergency response and incident management are important components for inclusion in any PBMC. The incidents occurring on the project corridor require immediate attention and direct day-to-day coordination with local and regional law enforcement and other emergency responders. Industry has performed well in building the necessary relationships and staging the proper resources to respond very quickly and effectively to these frequent round the clock events. Industry has demonstrated its ability to respond and deploy resources to the scene prepared to provide traffic control, lane clearance, and emergency repairs within minutes. By including these typical emergency responsibilities with the PBMC, industry will remain accountable for its role in system maintenance and operation, and the agency will be relieved of a major drain on its resources.

3 PBMC IMPLEMENTATION PRINCIPLES

Transitioning from a traditional approach to PBMC is not an easy task. It requires partnering and cooperation from the owners and industry to achieve the most effective results. A successful implementation of PBMC adheres to the following basic principles: allowing the contractor to take possession of the assets in an orderly manner, establishing a good partnering relationship, and continuously evaluating the contractor's performance throughout the duration of the project. The next sections describe these principles in more detail

3.1 MOBILIZATION

During the transition or mobilization period, the successful contractor takes possession of the assets and starts delivering the maintenance services in accordance with a pre-established plan. The contractor should be ready to provide emergency response and safety-related activities on the first day of the contract. A schedule of routine maintenance activities can then be implemented in accordance with the contractor's proposal.

A mobilization plan should be developed, and as a minimum include the following information: (a) activity and dates relating to equipment availability, (b) activity and dates relating to training and staffing the contract, and (c) activity and dates for acquisition of critical maintenance materials.

The owner and the contractor should plan on a 90-day mobilization period. A reduced payment schedule may be appropriate during this period. During the first six months of the contract period, the contractor typically evaluates the condition of all assets, brings certain assets up to the required maintenance level, prepares asset management plans, and commences all routine maintenance services. Therefore, a realistic practice adopted by some agencies establishes an initial period in which the contractor performs the work and the Department refrains from enforcing the performance requirements for a specified period, such as six months after the contract start date.

3.2 PARTNERING

Partnering fosters a collaborative and reasonable environment in which the contractor and agency work as a team to care for all project assets. Partnering is key to successful implementation of a PBMC program. A positive partnering relationship is essential in long-term agreements, especially as new and undefined contract conditions evolve. Some of the benefits that partnership can bring to the project include building trust, establishing a direct method to resolve issues, developing common goals and objectives, fostering creativity and innovation, and improving risk management techniques.

The agency should consider establishing a formal partnership charter with contractors and subcontractors as part of the requirements of the contract. An important element of the charter should be a well-defined dispute matrix that fosters dispute resolution.

Example Matrix for Resolution of Disputes Arising During MRP Ratings				
Dispute Level	Agency	Contractor	Process	Time Period
First Level	MRP Rater	MRP Rater	Dispute documented	Occurs at time of rating
Second Level	Project Manager	Project Manager	Joint review of site to seek resolution	Resolution within ten days
Third Level	District Maintenance Engineer	Contractor Principal	Discussion to seek resolution	
Fourth Level	State Maintenance Engineer	Contractor Principal	Department makes final decision	

A good partnering relationship will also help the agency to act rapidly in response to force majeure events. Clear communication based on a common understanding of each party's roles and responsibilities is essential to facilitate the process of restoring normal conditions to the highways.

3.3 EVALUATION

An important component of PBMC is the evaluation of the contractor's performance. The agency must evaluate the infrastructure assets on a regular basis to ensure that the contractor meets the performance requirements. The agency must bear in mind that the method for evaluating the contractor's performance should be systematic, transparent, reasonable, easily understood, and should include contractor involvement.

It is also important to note that for large systems, it is impractical (and very costly) to evaluate the condition of 100% of the assets. Obtaining a representative sample of the entire system is the more common approach. The conditions of the assets can be statistically extrapolated, with a reasonable margin of error, from the results of these representative evaluations.

In addition to asset condition evaluations, the agency may want to have a methodology for evaluating contractor adherence to key contract standards and specifications, especially those associated with customer responsiveness and quality of performance.

3.3.1 Evaluation of Asset Condition

Virginia and Florida are two states with established systems for evaluating asset condition. Both use a similar approach called a Maintenance Rating Program (MRP). The principles and processes that govern the evaluations are defined in an MRP manual. (Ref #3) The main objective of these programs is to establish a quantitative assessment of the condition of the assets.

In general, MRP evaluations consist of periodic maintenance ratings stemming from random inspections of short segments of the entire highway system. The agency, a third party, the contractor, or some combination, can conduct the evaluations. The different approaches are discussed in the table on the next page.

The agency has to effectively communicate the results of the MRP evaluations in a timely manner to the parties involved and remain open to discussing the results with the contractor. The agency should refrain from using complex evaluation approaches. However, the results must represent as accurately as possible the condition of the assets.

3.3.2 Other Agency Evaluations

Besides meeting a minimum standard of asset conditions, there are other performance outcomes that may be subject to regular evaluations, such as those deriving from timeliness and emergency response requirements, reporting accuracy, quality issues, and adherence to key agency specifications, to name a few. Typically, the contractor is responsible for providing complete and up-to-date timeliness reports, and the agency has the right to verify the accuracy of the information.

Florida, for example, uses a process to evaluate the overall performance of the contractor called the Asset Maintenance Contractor Performance Evaluation Report (AMPER). The AMPER includes the quantitative evaluation of several performance indicators, the MRP, and four subjective ratings to establish an overall numerical evaluation of the contractor. The AMPER is conducted twice a year. The final numerical evaluation for the contract is determined by averaging all the AMPER scores for the entire contract period after deleting the lowest score and the highest score.

Different Approaches to Assessing Asset Condition

Agency Evaluation: In-house staff conduct the evaluation to assess the condition of the assets and contractor's compliance with the performance measures. The agency should notify the contractor of any upcoming evaluation and avoid conducting the inspections without the contractor present, since it may affect the partnering relationship and increase the risk of disputes. One option is to conduct joint inspections to improve the cost effectiveness of the evaluations and to provide each party with the opportunity to use the data for its own purposes.

Third Party Evaluation: The owner agency can designate a representative or third party to conduct the field assessments. The third party is responsible for developing the assessment plan and providing the necessary quality controls to guarantee the accuracy of the results. One important advantage of this approach is an increase in objectivity due to the neutral position of the evaluator. The approach also allows agency and contractor to jointly review the results and develop a strong partnering relationship. The main disadvantage is the additional cost for the independent evaluator. However, this cost may be offset by a reduction in the number of disputes or a reduction in the time required to resolve those disputes.

Contractor Evaluation: The owner agency can allow the contractor to monitor itself in an effort to strengthen the partnering relationship. The contractor must provide accurate information in a manner that is timely and consistent with the agency's expectations. This approach has the advantage of being inexpensive; however, the risk of inaccurate data increases. The agency should monitor the process closely until confirming that the contractor is providing information suitable for making payment decisions.

3.4 QUALITY MANAGEMENT PROCESS

Prolonged asset life is one measure of the success of an effective maintenance program. The PBMC process promotes this concept when both parties are committed to an overall quality management process. A successful quality management program includes a process for identifying deficiencies and a process for correcting deficiencies. Both elements must be present and both parties must partner to ensure there is a non-adverserial approach that leads to improvements resulting in lower service costs or extended lifecycle of the roadway assets.

The management quality program may be divided into two major processes: a quality assurance process (QA) and a quality control (QC) process. Some desirable characteristics of each are: (a) minimizing the likelihood of needing to expand the agency's contract administration efforts, (b) providing confidence to the agency that the service will be carried out in accordance with the contract requirements, and (c) ensuring for well structured, easily audited documents.

3.4.1 Quality Assurance Process

The quality assurance (QA) process should describe in detail how the contractor plans to monitor its own performance, and the performance of its subcontractors, to ensure that contract requirements are met and the procedures for tracking roles and responsibilities for reporting results internally and externally. The scope of the QA plan should include control processes for managing the quality of key suppliers and vendors. In addition, the contractor must indicate how non-conformance with contract requirements will be reported and corrected.

The contractor must continue assessing the effectiveness of its QA plan and introduce any changes necessary to ensure the suitability, adequacy, and effectiveness of its quality management plan. This process improvement cycle is fundamental and the results should be effectively communicated among the parties affected, internally and externally.

3.4.2 Quality Control Process

The main purpose of the quality control (QC) process is to control the level of quality produced to identify problems with compliance and generate feedback that can be used to identify potential causes of those problems. The results of

QC inspections should help to identify potential differences between crews, equipment, resources, and methods that could be used to improve overall quality.

The quality control (QC) plan should provide a description of the process to monitor compliance with the contract requirements for all the maintenance activities, including emergency responses and customer service resolutions. To be effective, this monitoring effort should allow the contractor to monitor itself. The contractor must demonstrate how they will produce unbiased results in order to fulfill the purpose of the QC plan.

3.5 DEDUCTIONS AND INCENTIVES

Deductions should be established to encourage contractors to achieve the desired results. They should be fair and reasonable. Incentives should serve to encourage contractors to exceed the performance measures.

The decision of applying incentives and deductions to the payments must be supported with performance data, such as MRP scores or adherence/non-adherence to timeliness measures. The application of incentives and deductions varies from state to state. The following is the AMOTIA position.

Industry Recommendation on Deductions and Incentives*

Deductions: The agency should consider using a deduction approach where the performance measures are periodically assessed for compliance (two or three times a year), and a standard deduction is established for non-compliance. Under a deduction approach, any performance measure assessment made prior to the year-end assessment would result in a contract retention. If the contractor is able to bring the non-compliant asset up to and above the performance requirements, at a level that results in the average of all the assessments for the particular performance standard meeting or exceeding the performance requirement for the year, the amount(s) retained are returned at year's end. If the average total of all assessments does not meet the performance requirement, then a deduction is assessed. This approach has proven to be very successful for other agencies.

The following key principles are recommended for incorporation in the deduction contract clauses:

- Fair and reasonable deduction procedure
- Method to objectively assess the effectiveness of maintenance
- Deduction amounts reflective of the magnitude of damages incurred by the owner

Incentives: There are numerous areas where the use of incentive clauses could benefit the agency. Incentive clauses should be considered for use in areas where an improvement in performance results in a tangible benefit to the agency and/or the motoring public. Examples of some areas where incentives should be considered are:

- Response and clearance times related to traffic incidents/accidents. Typically there are minimum response times established to respond to incidents/accidents, but clearly if these response times are reduced significantly there is direct benefit to the agency and the motoring public. There are benefits from a financial perspective in user costs, and also a significant improvement from a safety standpoint related to reduced secondary accidents.
- Consistently high performance and operability rates for call boxes and highway lighting which exceed contract requirements, resulting in improved public safety.
- Traffic marking performance that significantly exceeds the contract requirements, resulting in safety improvements for the motoring public.

** Official AMOTIA position.*

REFERENCES

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