These presentations were prepared by the authors to motivate discussion among participants at a forum convened under NCHRP Project 20-24(61) Performance-Based Maintenance and Operations Management. The project was requested by the American Association of State Highway and Transportation Officials and conducted as part of National Cooperative Highway Research Program (NCHRP) Project 20-24. The NCHRP is supported by annual voluntary contributions from the state Departments of Transportation (DOTs). Project 20-24 is intended to fund studies of interest to the leadership of AASHTO and its member DOTs. NCHRP Project 20-24(61) was conducted by Applied Research Associates, Inc., under contract to Parsons Brinckerhoff. This document is not an official publication of the NCHRP, Transportation Research Board, National Research Council, or The National Academies. The presentations contained herein represent the views of their authors only. A report of the project, prepared by the research team, is available from NCHRP.
NCHRP 20-24 (61)
Executive Forum on Performance-Based Maintenance and Operations Practices

Presented To Executive Forum
Tampa, Florida
April 22-23rd, 2009

Draft Interim Report Overview
“Setting the stage”

NCHRP 20-24 (61)

- Convene Executive Forum
- Share views & experiences
- Develop strategies

Literature Review

- Survey questionnaires
- On-site & telephone interviews

Definition

PBMC is an approach to contracting that provides incentives/disincentives to the contractor to achieve performance standards or targets for measurable outcomes

PBMC is a shift from traditional methods-based quantity/unit price to performance outcomes and levels-of-service.
“Perfect Storm”
- Increased needs
- Increased expectations
- Funding limitations
- Personnel shortages

PBMC Trends
- Expanded use
- Process improvements
- Room for advances

Literature Review
- Domestic
- International

Domestic Experience
- FL DOT
- ODOT
- TXDOT
- VDOT
- WSDOT
- DCDOT

International Experience
- Argentina
- Australia
- New Zealand
- Ontario
- United Kingdom

Contract Characteristics
- Best value
- Fixed-price
- Multi-year (renewable)
- Perform measures
- Perform standards (LOS)
Contract Characteristics

- Activity Specific
- Bundled Activities
- Regional Activities
- Corridor (fence to fence)

Examples of Performance Measures

- Pavement Smoothness (IRI)
- Signs & Striping (Retro-reflectivity)
- Drainage (Flow & Structure Condition)
- Guardrail (As intended/time)

Strengths

- Supplement resources
- Cost savings
- Improve asset management
- Reduce administrative burden
- Promote innovation

Weaknesses

- Loss of direct control
- Cost & time for contract development
- Long-term sustainability
- Reduced competition

Lessons Learned

- Need good performance measures
- Use reasonable performance standards (LOS)
- Consider and address risks
- Use I/Ds that are commensurate with performance
- Consider pre-qualification, QC & QA.
Surveys of Owners/Contractors
- General survey
- In-depth interviews (9)
- Modified interviews (6)
- Contractor survey

General Survey
- 34 Questions
- 36 States/Ontario responded

Categorization of Respondents

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<th>% Respondents</th>
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<td>B</td>
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<td>C</td>
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PBMC for Multiple Maintenance Activities?

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Performance Standards for Maintenance Forces?

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Performance Standards for Contract Items?

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**PBMC Specific Activity?**

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**PBMC Region or Corridor?**

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<td>Yes</td>
<td>49</td>
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<td>Standard</td>
<td>10</td>
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</table>

**Several Reasons for Not Trying PBMC**

- Change in Culture
- Lack of Experience
- No Legal Authority
- Challenges in Cost Comparison
- Loss of Control
- Insufficient Competition/Capacity
- Encumber 5 years of funding

**In-Depth Interviews**

- 9 interviews
- 25 questions

**Motivation to Pursue PBMC**

- Insufficient Staff Resources
- External Political Interest
- Executive Management Interest
- Improved Efficiency
- Reduced Cost

**Contract Characteristics**

- Lump Sum
- Best Value (2)
- Performance-Based
- Multi-Year
- Incentive/Disincentives
Performance Monitoring

- Require Contractor QC Plan
- Define LOS Rating Process
- Use Knowledgeable/Certified in-house personnel (non-biased)
- Use External third party
- Define frequency, reporting, response

Lessons Learned

- Need good inventory and condition assessment
- Use definitive, reasonable proven performance measures.
- Do not “raise the bar” excessively in one shot.
- Recognize additional costs for higher LOS
- Learn from other experienced agencies
- Use interim milestones and consequences
- Specify how proposed innovations are approved
- Plan for the unexpected
- Consider incremental steps toward PBMC
- Approach the contract as a partnership
- Do not micro-manage the contract

Modified Interviews

- 8 questions
- 6 states

Needs to Reduce Sense of Risk

- Evidence of Improved Performance
- Same or Reduced Costs
- Help with Developing Documents/Procedures
- Concern with Loss of Direct Control

Survey of Contractors

- 11 questions
- 4 respondents

Value and Length of Contract

- Dollars and cost-effectiveness varies with scope from contract to contract
- A 5-year contract term should be the minimum.
- Owner agency should solicit input from the industry
How Contracts Made Most Cost-Effective

- Use “Best Value” selection process
- Define specific, reasonable performance standards or requirements.
- Establish clear, consistent performance monitoring
- Allow contractors the freedom to INNOVATE
- Include a broad scope of activities
- Use incentives/disincentives with the ability to recoup penalties
- Provide accurate asset inventory/condition baseline data

Include Snow & Ice Control?

- 3/4 said “yes”
- use a “cap” and pay above the “cap”
- reimburse on a prescribed fee basis
- allow purchase of materials from the State contract
- This should be weighted item in technical proposal

Conclusions

- Use of PBMC is growing worldwide
- Considerable interest in pursuing PBMC among State DOTs
- PBMC contracts and performance measures are evolving
- Top Management Interest is Key to Initiating PBMC
- Skepticism over Cost Savings
- Concern over Loss of Control

Recommended Needs

- Information exchange with “model” documents
- Peer-to-peer or mentor/protégé processes
- Widely accepted, systematic cost comparison methodology
- Efforts to improve performance measures and protocols, standards, LOS and valuation of various levels of performance
- Training programs on PBMC concepts
Georgia Department of Transportation
Comprehensive Maintenance Contracting Experience

BY:
Terry F. Rutledge
State Maintenance Liaison Engineer
April 23, 2009

GDOT's CMC Experience

- GDOT History
  - Maintains state route system only
  - Currently has 5400 employees
  - 2700 +/- in Maintenance
  - Over 18,000 Center line miles
  - Includes 1,245 CLM of Interstate
  - 15,000 Bridges

- GDOT Outsourcing History
  - Maintenance Resurfacing program
  - In mid to late 90’s in midst of downsizing and re-organization
  - Interstate mowing contracts
  - Landscape and custodial contracts at welcome centers
  - Expanded w/ shoulder sweeping and drain cleaning service on metro Atlanta interstates

- GDOT had a CMC study performed in Oct. '05
  - Performed under the direction of GA Tech
  - RESULTS:
    - Cost understanding of existing maintenance management system
    - Inventory and condition assessment
    - Determined possible savings of 0.03% for Interstate corridors
    - Recommended “Pilot project” for full evaluation

- Legislation called for a Performance Audit
  - Performed by GA Dept of Audit's
  - Study was completed in Nov. '07
  - Results
    - Continue efforts with current pilot project
    - Implement project if contractor’s bid indicates cost savings
    - GDOT already developing CMC contract – prepared to bid in 90 days

- Reviewed contracts from other states
  (Florida, NC, Texas, Virginia)
- Visited NCDOT for in-depth review of their implemented contract
- Began preparing contract documents
- Began developing plan to inventory assets along corridors (resource and time critical)
GDOT’s CMC Experience

- Identified possible corridors
  - Looked at different Interstate options
  - I-285 Only (Outer Perimeter)
  - I-285 including I-75, I-85 and I-20

- Identified optional formats
  - Alternate bids for “with” or “with-out” snow removal
  - Also a “with” or “with-out” by corridor

GDOT’s CMC Experience

- Asset Inventory and condition assessment proved to be one of the most challenging tasks
  - Maintenance management personnel brought in from around the State
  - Provided training to these personnel to identify each asset along with measurement criteria to develop an overall condition
  - Gave 30 days to complete this assignment
  - This information is required to establish performance criteria

Factors to consider:

- $$$$/Funding
- Length of contract
- Service level (existing)
- Service level (proposed)
- Current resources
- Current system
- Cost comparison
- Employee moral

Thank You

????
Turnkey Asset Maintenance Services
TAMS

April 23, 2009

Robert E. Prezioso, PE
Acting State Maintenance Engineer

WHY?

1. Workload exceeded staffing resources
   - Sandston/Williamsburg staff reductions
   - Same staff responsible for several hundred lane miles of local roads

2. Expiring Public-Private Partnership
   - Needed to establish a successful contracting mechanism to replace the original Asset Management contract with VMS

3. Legislative Mandate
   - Virginia legislature passed bill to mandate outsourcing of Interstate maintenance by July 1, 2009.

ADVANTAGES

1. Reduced Agency staffing needs
   - Interstate ordinary maintenance = less than 50 VDOT employees

2. Focus on Asset Condition
   - Contract language generates a greater focus on asset condition
   - Agency forces had too many Priority 1 tasks and could not maintain an effective proactive program

3. Consistent budget obligation
   - Lump sum bids allow for equal annual contract amounts (divided into equal monthly payments)

CHALLENGES

1. Agency staff transition and development
   - From Project Engineer/Inspector/Maintenance Manager to Business Manager
   - No longer doing or directing the work; managing the work
   - Advanced inspection protocols; daily/event driven, monthly, annual
   - Assess of effectiveness, quality and value of services
   - Documenting and implementing areas for improvement

2. Baseline Condition Assessment
   - Helps build realistic Performance Criteria
   - Helps contractor submit an effective bid proposal

3. Contractor Risk
   - Too much risk to contractor equates to extreme profit or potential default
   - Contractor Risk costs agency

4. Unplanned Budget Reductions
   - Lump sum bids make requests for price reductions difficult
   - Interim or post-contractual service reductions
   - Consider Line Item bids
   - An overly itemized request limits the contractor’s flexibility to achieve their most cost effective solution

Thank you

Robert E. Prezioso, PE
Acting State Maintenance Engineer
Robert.Prezioso@VDOT.Virginia.gov
Asset Maintenance & Performance Based Contracts
Florida Department of Transportation

Tim Lattner, P.E.
Director, Office of Maintenance
Florida Department of Transportation
April 23, 2009

Florida DOT Breakdown
- 7 Districts, 1 Turnpike Enterprise
- 35 Maintenance Areas
- 67 Counties
- 7,448 Employees (10,354 in 2001)
- 1,950 Maintenance Employees

Florida District Layout

Florida Statistics
- 22nd in Total Area
- 26th in Land Area
- 4th in Population
- 12,066 Centerline Miles
- 42,022 Lane Miles (Ranks 12th)
- 3rd in Vehicle Miles Traveled
- 4th in Bridge Deck Area

Contract Types
1. Traditional
   - Work Order Driven
   - Project Specific
2. Performance-Based
   - Asset Maintenance
   - Performance Based
3. Other / Hybrids
   - Memorandums of Agreement
   - Emergency Contracts / Hurricane Cleanup Pre-Event Contracts
   - Contractual Service Contracts

Asset Maintenance and Performance-Based Contracting
**Asset Maintenance Contracting**

- An Asset Maintenance Contract is a long-term, performance-based contract encompassing all (or most) maintenance functions required to serve the public and maintain the roadways within specific roadway corridors or entire geographical areas.
- Does not include major roadway resurfacing or repairs due to damage eligible for FHWA/FEMA reimbursement.
- Used to be called Asset Management.

**Non-AM Performance-Based Contracting**

- Other performance-based contracts are shorter term (prefer 3 to 5 years) focusing on a particular maintenance functions, such as aesthetics or roadway striping & RPMs.
- Most feature specific list of performance measures unique to contract requirements, rather than using the MRP performance measures.
- Recently developed Performance-Based Contract Scope Customization System.

**Key Elements of AM Contracts**

- **Performance Based**, not Work Document based
- **Long term contracts**
  - 5 to 10 years (up to 20 years with renewals)
- **Fixed lump sum monthly payments**
- **Dynamic** - Asset Maintenance Contracts are written to require Contractor to use the most current policies and procedures – this ensures a “dynamic” contract – website holds complete list of contract documents.
- **Clear Performance Measures**

**Expectations and Evaluations**

- Maintain road system according to performance measures as outlined in the AM Scope and according to established Department policies, procedures, and guidelines
- Evaluate Contractor in 2 ways
  - Compare actual performance to performance measures using the pre-existing MRP concept
  - Grade Contractor semi-annually through AM Monitoring Plan/Contractor Evaluation System (new)

**Performance Measures**

- Pre-determined reductions in payment (disincentives) for failure to meet established performance measures
  - MRP Criteria
  - Safety related & other specific criteria
    - Most specific performance measures primarily related to safety items
    - Additional disincentive categories not covered by MRP
    - “Catch-all” disincentive for violation of any policy, procedure, guideline, etc.
    - “Catch-all” disincentive for violation of submitted Technical Proposal - Technical proposals are made part of contract terms – they must deliver what they promise

**Performance Measures**

- Semi-annual AM Monitoring Plan/Contractor Evaluation System
  - Still under development – about 90% complete
  - So far both Industry and Department like the System
- Poor grades can result in:
  - Declare Contractor Non-Responsible (suspended from bidding on new jobs)
  - Default of current contract
  - Difficulty in getting future AM Contracts since past grades/performance will be a factor in scoring technical proposals for future jobs
- Good grade can result in better chances to get future contracts
**MRP NOTES:** The Department will hold the retainage withhold from MRP Periods 1 & 2 until the Department calculates the Final Annual Rating. If the Final Annual calculated deduction is less than the total accumulated retainage for the fiscal year, the balance will be deducted from the Contractor’s payment. All deductions withheld from the Contractor and all retainage refunds to the Contractor will occur through adjustments to the next appropriate monthly invoice amount.

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### GUARDRAIL

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<th>Time Allowed/Criteria</th>
<th>Deduction</th>
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<tr>
<td>a. Failure to perform timely inspections</td>
<td>Per Procedure 850-050-003</td>
<td>$500 per day per delinquent inspection</td>
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<tr>
<td>b. Failure to timely submit Inspection Sheets/Reports</td>
<td>Due within 15 days after completion of inspection</td>
<td>$100 per day per delinquent report</td>
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<tr>
<td>c. Failure to make repairs identified in Inspection Reports within 30 days of identification</td>
<td>Must secure with proper MOT before leaving the site</td>
<td>$500 per day per guardrail</td>
</tr>
<tr>
<td>d. Failure to make temporary safety repairs resulting from incidents</td>
<td>Repair within 10 calendar days of incident</td>
<td>$1,000 per day per guardrail</td>
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### EMERGENCY RESPONSE

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<td>a. Failure to properly respond to an incident and/or follow Incident Procedures established in the Open Road Policy</td>
<td>Per Emergency Management Section requirements established in the Open Road Policy</td>
<td>$5,000 per hour, prorated, per incident/event</td>
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**SUBMISSION OF DEPARTMENT REQUESTED DOCUMENTS**

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<th>Time Allowed/Criteria</th>
<th>Deduction</th>
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<td>a. Upon Department request, failure to submit any documentation to maintain or update the Contractor’s information</td>
<td>Submit documentation by the end of the business day following the day of the Department’s request</td>
<td>$100 per business day per requested document</td>
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### Performance Expectations

- Establish clear performance measures that allow changes to statewide practices updated during the contract period (Dynamic)
- Use existing performance evaluation methods (MRP) wherever possible
- Avoid subjective performance requirements
- Require the Contractor to self-evaluate and report performance results (call logs, emergency response)

---

### Challenges

- Evaluation of contractor
- Natural disasters (Hurricanes)
- Training program
- Consistency of contract scopes
- Risk
- Control

---

### Best Practices / Lessons Learned

**Per Procedure 850**

- **Emergency Management:**
  - Staffed 24 hours, 7 days a week, 365 days a year
  - Includes response to all incident events
  - Pre-established procedures

- **MRP Program:**
  - Consistency of contract scopes
  - Deduction/Retainage
  - Time Allowed/Criteria
  - Deduction
  - Consistency of contract scopes
  - Deduction

- **Deficiency Identification:**
  - One eighth percent (.125%) of one half percent (.5%) of the annual contract amount for each MRP point below procedural requirements for each element rating

- **Retainage:**
  - One quarter percent (.25%) of one third of the annual contract amount for each MRP point below procedural requirements for overall MRP score

- **Per APPLICABLE PROCEDURE:**
  - Staffed 24 hours, 7 days a week, 365 days a year
  - Includes response to all incident events
  - Pre-established procedures

- **Submission of Department Requested Documents:**
  - Required upon Department request
  - Prorated per day per requested document

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**SUBMISSION OF DEPARTMENT REQUESTED DOCUMENTS**

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Best Practices / Lessons Learned

**Administration & Project Management**

- Build on the successes of previous contracts
- Expect (allow) the Asset Maintenance Contractor to do his job, **don’t micromanage**
- **Do not over-inspect!!**
- Hold Asset Maintenance Contractor responsible for record keeping, storage & retrieval
- Incorporate all active traditional maintenance contracts into new AM Contracts
- Carefully consider how to handle Emergency Response and Recovery

**Asset Maintenance Contract Status**

- Early 2004, $484 Million in 17 executed contracts
  - $64 Million annually
- Early 2006, $700 Million in 23 executed contracts
  - $95 Million annually
- Currently, $900 Million in 30 executed contracts
  - $129 Million annually

**Statewide Balance Charts for Expenditures in In-house, Traditional & AM Contracts**

- 1994: In-house 45%, Traditional 60%
- 2002: In-house 30%, Traditional 24%
- 2005: In-house 29%, Traditional 29%

**Statewide Roadway Maintenance**

- AM: 2006: 57%, 2007: 21%
- Non-AM: 2006: 50%, 2007: 21%

**Statewide Bridge Inspections**

- AM: 2006: 73%, 2007: 53%
- Non-AM: 2006: 62%, 2007: 30%

**Maintenance Rating Program (MRP)**
Maintenance Rating Program

- Maintenance Rating Program (MRP) is a method of conduction a visual and technical evaluation of actual highway maintenance conditions
  - By Statute, 100% of roads on the State Highway System must achieve the maintenance standard
  - The maintenance standard for every State roadway is achieving an MRP target score of 80 or above
  - Operating Policy: Provide full funding required to achieve the MRP target score for 100% of State roads

- Each District is evaluated 3 times per year
- Each District has a rating team composed of two team members
- Each sample point is 1/10th mile (528 feet) long
- Evaluations are conducted on foot for detailed visual and instrumental analysis
- Each 528-foot roadway segment is evaluated against established standards and given a Pass or Fail rating for each characteristic

- Random sample points are generated from RCI data at Central Office
- Each District prints their random sample points on a coding form, sorted by:
  - maintenance area
  - roadway ID #
  - location mile post
  - facility type
- Pass/Fail ratings are recorded on paper for later entry into the mainframe MRP computer

- The roadways within a maintenance area are divided into four roadway classifications (facility types):
  - Rural Limited Access (Interstates outside of cities)
  - Urban Limited Access (Interstates within cities)
  - Rural Arterial (All non-Interstate outside of cities)
  - Urban Arterial (All non-Interstate within cities)
- 30 points per facility type per maintenance area

- MRP is divided into five categories (elements) and each element is further divided into characteristics:
  - Roadway (9 characteristics)
  - Roadside (5 characteristics)
  - Traffic Services (9 characteristics)
  - Drainage (6 characteristics)
  - Vegetation and Aesthetics (7 characteristics)

- All characteristics are evaluated against an established performance standard. These standards are described in great detail in the MRP Handbook
- Where the MRP Handbook does not apply, Department Design Standards are used
Maintenance Rating Program

- Each characteristic is assigned a weighted factor based on its importance to the safety and preservation of the roadway system.
- Each element is also assigned a weighted factor placing more importance on safety items.

Maintenance Rating Program

- Numerical ratings (MRP Scores) are calculated for each facility type.
- Scores for facility types are weighted according to total number of miles of each facility type.
- An overall MRP Score is calculated from the MRP Score of each facility type.
- The overall MRP Scores for maintenance areas are rolled up into an overall Statewide MRP Score, which is then reported to the Executive Committee as Florida’s “Report Card.”

MRP Performance Criteria

- **Flexible Pothole** - No defect is greater than ½ square foot in area and 1 ½ inches deep. No previous base is exposed in any hole.
- **Flexible Edge Raveling** - 90% of the total roadway edge is free of raveling. No continuous section of edge raveling 4 inches or wider exceeds 25 feet in length.

MRP Performance Criteria

- **Raised Pavement Markers** - 70% of the required markers are functional (reflective). No more than 100 feet of continuous centerline or lane line is without a reflective marker.
- **Guardrail** - Each single run functions as intended.
- **Signs (Greater than 30 sq. ft.)** - 85% of the signs are functioning as intended.

MRP Performance Criteria

- **Inlets** - 85% of the opening is not obstructed.
- **Side/Cross Drain** - 60% of the cross-sectional area of each pipe is free of obstructions and functions as intended.
- **Litter Removal** - The volume of litter does not exceed 3 cubic feet per 1 acre excluding all travel way pavement.

MRP Performance Criteria

- **Turf Condition** - Turf in the mowing area is 75% free of undesired vegetation.
- **Landscaping** - Vegetation is maintained in a healthy, attractive condition.
- **Slope Mowing** - Not more than 2% of vegetation exceeds 24 inches high. This excludes allowable seed stalks and decorative flowers allowed to remain for aesthetics. The area shall be evaluated in accordance with the mowing guide as a minimum.
Maintenance Rating Program

- MRP Scores provide information used to schedule and prioritize maintenance activities
- The evaluated characteristics correspond to features in the RCI system and to activities in our Maintenance Management System (MMS)
- MRP Scores are compared with work efforts from the maintenance areas captured in MMS
- Reports are generated to compare MMS-reported work efforts to an overall MRP Score of 80

Questions?

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Performance-Based Contracting for Maintenance

Overview of Ontario, Canada

NCHRP 20-24(61) Executive Forum

April 23, 2009
Tampa, Florida

Contents

- Ontario Overview
- Current Contract Models
  - Managed Outsourcing
  - Area Maintenance Contracts
- Winter Performance
  - Measures and Outcomes
- Sustainability
- Lessons Learned

Province of Ontario

- 1.1 million km² (416,000) square miles
- System:
  - 39,658 lane-km of highway (24,642 lane-miles)
  - 16,602 centre-line km (10,316 centre-line miles)
- Over 2,500 bridges/structures
- 29 Remote Airports and 8 Ferry Services

Province of Ontario

- Values:
  - Replacement: $58B
  - Current: $43B
  - Book: $12.5B
- Capital Program:
  - 09/10 - $2.5B
- Maintenance and Operations
  - 09/10 - $287M (includes approved and proposed)

Province of Ontario

- Highways carry about $3B daily
- Fourteen international crossings - $325B/yr
- Population approximately 12.7 million
- 10.6M registered vehicles
- 8.9M licensed drivers
- Amongst the safest roads in North America
- Road liability assigned to the ministry by statute

Maintenance

Routine Maintenance
- Pothole repair
- Shoulder grading
- Guide rail and fence repair
- Traffic signal & illumination maintenance and repair
- Sign replacement
- Pavement marking
- Culvert & drainage maintenance
- Grass cutting & weed control
- Bridge cleaning & minor repair
- Debris removal
- Road sweeping

Winter Maintenance
- Plowing, liquids, sanding and salting

Patrolling
- Visual inspection

Emergency Response
- Collisions, spills

Maintenance Excludes: Resurfacing, Rehabilitation or Reconstruction
Current Maintenance Contract Models

- **Managed Outsourcing**
  - 7 areas, 40% of system
  - Each area about 600 lane-miles in size
  - Ministry staff patrol highways and direct work
  - Contractors provide services
  - Many small, functional contracts (activity based)
  - Fixed term, e.g. 3 to 7 years

- **Area Maintenance Contracts**
  - 16 areas, 60% of system
  - Each area 200 to 750 lane-miles in size
  - Contractor plans and delivers work
  - Lump Sum, fixed term, e.g. 7 to 10 years
  - 73% of province-wide winter fleet

Performance-Based Contracts

- **Executive decision to proceed**
- **Language developed over several months**
  - Internal expertise
- **Consultation and input from industry and ministry experts**
- **The Work is the same**
  - Appropriate outcome measures lead to a high degree of confidence that products perform as intended
  - Contractor performance based on results achieved not methods used

Performance Requirement

- **Scope and Definitions**
- **Contractors Responsibilities and Obligations**
- **Outcome Targets**
- **Outcome Target Indicators**
- **Conformance to Outcome Targets**
- **Consequences for Non-Conformance**
Winter Performance

• Largest cost area
• High public visibility
• Bare Pavement Performance Measure
  – Publicly reported
  – Target is to achieve bare pavement within class standard 90% of the time
• Outcome targets set to achieve desired results

Winter Outcome Targets

• Circuit Times
• Equipment Utilization
• Application Rates for Materials (Sand/Salt)
• Continuous Plowing
• Echelon Plowing
• Level of Service

Consequences for Non-Conformance

• Circuit times
  – $5,000 if fail to complete circuit
• Equipment Utilization
  – $1,000 if not fully utilizing equipment
• Application Rates
  – $1,000 if outside minimum allowable rate

Early Indications with AMC 3.x

• Industry understands and can bid
• Favourable price
• Innovations will come
• Evaluation process can be streamlined
• Flexible structure for scope additions, innovations or new requirements
• Confidential consultation critical to success
• Interest from international bidders

Sustainability

• Industry
  – Competitive
  – Relationship Management
  – Performance Ratings
• Contract Management
  – Standards
  – Oversight and Administration
  – Funding commitment
• Knowledge Management
  – Traditional versus Modern

Lessons Learned

• Longer term=more certainty, better prices
• Contractors improve with experience
• Innovation is possible
• Industry health and competition critical
• Management of long-term relationship
  – Consultation is vital
• Not a construction contract or relationship
Suggestions

• Communicate and cooperate
• Innovate
• Manage the issues
• Be open to industry's interests
• Plan for the future
  → The first contract is only the beginning…

Suggestions

• Long and deliberate process
• Implement gradually
• Talk to others to learn
• Ensure solid executive support and direction

Summary

• Two maintenance contract models in practice for 100% of the network
• Shift to performance-based is underway
  – More efficient, timely and flexible
  – Service provider is accountable
  – How the Work is measured changes
  – Outcome based

The End

• Thank you!
AMOTIA, Inc.

Association for Management and Operations of Transportation Infrastructure Assets, Inc.

Today’s Agenda
- Who is AMOTIA?
- What is PBMC?
- Gary: Present some challenges to having a successful contract/project and ways to address them.

AMOTIA, Inc.

PBMC Executive Workshop
-- April 2006

“Do you have an association with whom we can work? If not, when can we expect one?”
-- Don Hillis, MO DOT

“No we don’t but we should.”

AMOTIA, Inc.

So ...
- A couple of leaders
- A little seed money
- An Interim Director
- An association lawyer

And ...
- Association for Management and Operations of Transportation Infrastructure Assets, Inc.

Objective 1
- Serve as the industry voice in the fast-growing field of private sector management and operations of transportation infrastructure assets.
Objective 2
- Provide a forum for members to exchange ideas.

Objective 3
- Advocate policies and practices that help members work cooperatively and efficiently with infrastructure owners.

Objective 4
- Promote the use of performance measures, creative risk allocation, and other techniques that stimulate creativity and innovation, resulting in safe and cost-effective management of owner assets.

Today's Agenda
- Who is AMOTIA?
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PBMC Definition
- Outcome-based contract focusing on meeting performance requirements for assets within a fixed corridor for a fixed time period for a fixed price.
- The Agency identifies the performance requirements.
- The contractor determines how the work will be accomplished and with what resources to meet the performance requirements.

PBMC Framework
- Multi-year, lump-sum contract
- Qualification-based, negotiated
- Bundled services (no unit prices)
- Monthly payments
- Performance Standards w/Measurements
Main Products
- Performance-based Maintenance
- Performance-based Operations and Management

Delivery Method
- Direct Contract
- Public Private Partnership

Today's Agenda
- Who is AMOTIA?
- What is PBMC?
- Gary: Present some challenges to having a successful contract/project and ways to address them.

Challenges
- Basic Premise of PBMC
- Qualification-based Contracting
- Performance specifications
- Costs Estimates
- Level of Service

Innovative Spirit
“AASHTO member states must embrace new strategies that demand accountability and performance measurement.”
- Pete Rahn, MO DOT, AASHTO – October 2007

Solutions
- Benefits: Go from Perceived to Actual
- Problems: Go from Perception to Truth
- Joint Training and Education
- Case Studies and Lessons Learned
- Recommended Practices / Specifications / Positions
- FHWA/DOT/AMOTIA Steering Committee (?)
- Demonstration / Trial Projects / Documentation

Risks Management
- Decreasing Public Risks, Increasing Private Risks
- Force Account Maintenance Contracts PBC Concessions BOO
PBMC Benefits: Fact or Fiction?

- Purchase management system
- Focus on outcomes, not input
- Money goes where needed
- Allows private sector purchasing rules
- Saves direct/indirect costs or get better value
- Consistently meet the performance standards
- Allows owner more time to focus on governing and managing

Gain Innovation and Flexibility

- Work planning
- Work approach
- Hiring (and firing)
- Purchasing
- Materials and Equipment

Focus on Service Level Improvement

- Monies reserve for maintenance (lock-up)
- Owner Reallocation of Work Force
- Links Bridge Inspection w/ Bridge Repairs

Nearly all are perceptions

- Nearly all can be answered by either experience or by agreement
- Practice makes perfect!!

Two Perceived Problems

- Insufficient contractor capacity
- Inability to achieve sufficient competition

FHWA/DOT/AMOTIA Steering Committee

- Resolve the outstanding issues
- Promote & guide projects
- Conduct joint training, guidelines, practices

Will lead to a more viable AND larger contractor pool.

Solutions

- Focus on the Actual/Perceived Benefits
- Joint Training and Education
  - Understand Performance
  - Understand Performance Contracting / Specifications
  - Understand Partnering / Monitoring
- Case Studies and Lessons Learned
- Recommended Practices / Specifications
- FHWA/DOT/AMOTIA Steering Committee (2)
  - Demonstration / Trial Projects / Documentation
Focus on Future

- D-B-M-O-F / MAC Concept / Alliance Contracting
- Solving more than just a funding need
- Long term focus on maintenance & operations
- Focus Today: $$
- Focus Tomorrow: $$ plus operations, maintenance, capital improvement, and turnback

Final Thought

- AMOTIA supports Balanced Maintenance
- DOT Work Force
- Unit Price Private Sector Contracts
- PBMC Private Sector Contracts

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NCDOT’s Performance Based Contracting Experience in Charlotte

Jennifer Brandenburg, PE
State Road Maintenance Engineer
July 21, 2009

Overview

• Performance Base Contracting in NC
• Project Scope
• Contract Development
• Risk Analysis
• Assessing Performance
• Contract Status
• Next Steps
• Lessons Learned

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  – Infrastructure Management Engineer
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NCDOT’s Introduction

• NC Senate Bill 622 of the 2005 General Assembly stated:
  “The Department of Transportation may implement up to two performance based contracts for routine maintenance and operations, exclusive of resurfacing. Selection of firms to perform this work shall be made using a best value procurement process”

Other Driving Factors

• Growing highway system
• No additional employees
• Increased public demand for service
• Successful in other states
• Good comparisons:
  – Cost to obtain a level of service vs. amount of effort
  – Contract vs. DOT cost to maintain a section of roadway

Benefits

• Fixed cost over the life of the contract
• One single point of contact vs. multiple contacts
• Utilizes and grows small businesses
• Utilizes QC/QA process
• Allows DOT employees to focus on other routes
• Contractor can focus on a defined segment of highway
Challenges

- Requires dedicated funding for life of project
- Hard to quantify performance measures
- Major change in business practices
  - Loss of control over contractor
  - Shifting of risk and responsibility
  - “We’ve never done it this way before”

Project Scope

Items of work included:

- Pavement maintenance
  - Patching
  - Paved shoulders
  - Crack sealing
- Roadside maintenance
  - Turf condition and mowing
  - Plant bed maintenance
  - Litter pickup
- Roadway maintenance
  - Shoulders
  - Drainage
  - Guardrail/barriers

Items of work included:

- Traffic maintenance
  - Overhead signs
  - Ground mounted signs
  - Pavement markings
  - Pavement markers
- Bridge maintenance
  - Bridge components
  - Sweeping
  - Damage repair
  - Noise and retaining walls

Items of work not included:

- Snow & Ice (alt. bid item)
- IMAP and Incident Response
- ITS devices
- Rest areas
- Wildflower beds
- Some roadway and sign lighting

Contract Development

- Team Approach
  - SRMU
  - Other Central Raleigh units
  - Division experts
  - Other State experiences & documents
- Design-Build model
  - Process for qualifications (RFQ)
  - Shortlist firms
  - Request for proposals (RFP)
  - Review of technical proposals and cost proposals separate
  - Best and final offer
Taking Our Time

- Legislation Passed: July 2005
- Contract Development: June 2006
- Best and Final Offer: Jan. 2007
- Contract Awarded: May 2007
- Partnering Session: July 2007
- Date of Availability: July 2007
- Contractor Began Work: July 2007

Risky Business

- Risk
  - Snow & Ice removal
  - Damage reimbursement
  - Incident response
- Cost
  - Bonding
  - Existing conditions
  - Untested performance measures
  - Penalties for non-performance

Payment for Performance

<table>
<thead>
<tr>
<th>Element Rating</th>
<th>Payment (% of Element Value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>At or above target</td>
<td>100%</td>
</tr>
<tr>
<td>1-5 below target</td>
<td>75%</td>
</tr>
<tr>
<td>6-10 below target</td>
<td>50%</td>
</tr>
<tr>
<td>Greater than 10 below target</td>
<td>0%</td>
</tr>
</tbody>
</table>

Assessing Performance

- Sampling
  - Linear features assessed in random 0.2 mile sample sections
    - i.e. Guardrail, Median Barrier, Pavement, Mowing, etc.
  - Point features not evenly distributed are sampled from an element inventory.
    - Pipes, Drop Inlets, Signs, Noise Walls, etc.

Assessment Sampling

- Sample size methodology developed by Dr. Jesus M. de la Garza (VPI)
  - Used by VDOT on their TAMS contracts
  - Sample size controlled by condition of element at last assessment
    - i.e. Poor Condition -> Large Sample Size
    - Good Condition -> Small Sample Size
  - Added 10% to the sample size
  - 95% confidence in results (typ within +5%)
    - Penalties were waived for elements with high confidence intervals.
Assessment Tools

- Initial assessment (Spring 2007)
  - Paper forms
  - Recreational grade GPS
  - Introduced error
- Subsequent assessments
  - PDA devices
  - Recreational grade GPS
  - Still errors
- Fall 2008 assessment
  - Tablet PCs
  - ArcGIS/ArcPAD software
  - Bluetooth grade GPS receivers
  - Better quality data

Working Well

Assessments

Assessments

Assessments
Assessments

Performance Targets

- “Reasonable” test
- Targets were set high
- Q and A sessions
- Onsite meetings to review targets
- Cooperative approach

Contract Status

- Partnering workshop April 2009
- Mutual termination agreement May 2009
- Punchlist provided to contractor June 2009
- Contract ended July 1, 2009

Charlotte Scope v2.0

Next Steps

- Refining project scope July 2009
- Version 2.0 advertisement Sept. 2009
- Contractor selection process begins Oct. 2009
- Contract awarded January 2010
- Contract availability April 2010
Lessons Learned

• Start early
  – Find a mentor
  – Bring in field staff early
  – Develop a detailed scope early in the process
  – Be reasonable with timelines

• Communicate
  – Listen to the contracting community
  – There is no such thing as too much detail
  – Conduct an initial assessment and take pictures
  – Communicate early and often with all levels of management
  – Be open with front line employees

• Be smart
  – Use technology
  – Be reasonable about the size and scope of the project
  – Continually reevaluate risk

Questions?