Introduction of performance-based maintenance contract in expressways in Japan

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1. Introduction
Expressways in Japan

NEXCO group Total (as of May 2010)

| Service Length | 8,674km |

- East NEXCO
- West NEXCO
- Central NEXCO
- Japan Bridge Co.
- Hanshin EXPWY Co.
- Metropolitan EXPWY Co.
• We aim to ensure complete safety and reliability

• Efficient maintenance and management of deteriorating highway structures under severe budgeting restriction are becoming serious issues

• One of the solutions is to apply Performance-Based Contracting (PBC) method for routine highway maintenance
# Traditional and PPP-based Contracts

Table 1 Traditional Contract and PBC

<table>
<thead>
<tr>
<th></th>
<th>Traditional Contract</th>
<th>Performance-Based Contract</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Items specified in Contract</strong></td>
<td>Techniques, technologies, materials and quantities of materials to be used, time period</td>
<td>Performance criteria throughout the period</td>
</tr>
<tr>
<td><strong>Decision-making</strong></td>
<td>Client</td>
<td>Contractor</td>
</tr>
<tr>
<td><strong>Payment</strong></td>
<td>Based on “Inputs”</td>
<td>Based on “Outputs”</td>
</tr>
</tbody>
</table>
Performance-Based Contract (PBC)

- Routine maintenance works are contracted out to private sectors
- Targeted performance level and functional requirements are indicated
- The contractor is responsible for decision-makings on maintenance strategy in order to ensure required performance criteria
Advantages of PBC

- Cost savings in managing and maintaining road assets
- Uniform (fixed) annual expenditure for highway agencies
- Decreasing the workload for agency engineers
- Better customer satisfaction with road conditions and services
- Applying long-term maintenance strategy
World’s Experience

- USA Virginia Department of Transportation  
  (Cost saving effects 10%-40%)
- USA Florida Department of Transportation  
  (Routine Maintenance and Asset Maintenance)
- Transit New Zealand  
  (30% decrease in professional costs and 17% decrease in physical works with traffic growth by 53%)
2. NEXCO-West Strategy
NEXCO-West’s routine maintenance;
- Executed by partner companies
- Traditional contract (NEXCO-West orders partner companies “what to do”, “when to do” and “how to do”)
- Partner companies don’t have enough management ability

Innovative framework providing incentives to partner companies is required
## Advantages of Partner Company

Table 2 Partner Company and Outsourcing

<table>
<thead>
<tr>
<th></th>
<th>NEXCO-West -Partner Company</th>
<th>World's Experience -Outsourcing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contract Period</td>
<td>Long</td>
<td>Short</td>
</tr>
<tr>
<td>Moral Hazard</td>
<td>Low Risk</td>
<td>High Risk</td>
</tr>
<tr>
<td>Cost Reduction</td>
<td>Low</td>
<td>High -Bid system</td>
</tr>
<tr>
<td>Sharing Common Goals</td>
<td>Good</td>
<td>Not good</td>
</tr>
</tbody>
</table>

- World’s experience shows that outsourcing does well
- Few highway maintenance companies in Japan
- Partner company is better in the long term
- We made choice of the contract with partner company
3. The Pilot Project
Pilot Project

- **Length**: 640 Lane km (two maintenance offices)
- **Traffic**: Low
- **Bonus**: No bonus (If above the criteria)
- **Penalty**: No penalty (If below the criteria)
- **Risk**: Contractor takes limited risk (e.g., No disaster risk)
- **Payment**: Not Fixed
- **Inspection**: Quarter annually
- **Personnel**: Several engineers are dispatched
  Exchange from NEXCO-West
## Performance Criteria

### Table 3 Performance Criteria for Each Asset Item

<table>
<thead>
<tr>
<th>Items</th>
<th>Quantitative Criteria</th>
<th>Qualitative Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Routine Maintenance</td>
<td>Timeliness Requirement</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road Sweeping and Cleaning</td>
<td>Amount of litters collected is 50t/year or greater</td>
<td>1. No debris(sand,dirt) at roadside shoulder</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. No litters or objects on roadways</td>
</tr>
<tr>
<td>Vegetation Control</td>
<td>N/A</td>
<td>1. Ensure driver’s visibility</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Delineators can be seen at nighttime</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Items</td>
<td>Quantitative Criteria</td>
<td>Qualitative Criteria</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>-----------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td></td>
<td>Routine Maintenance</td>
<td>Timeliness Requirement</td>
</tr>
<tr>
<td>Emergent Pothole Patching</td>
<td>N/A</td>
<td>Complete temporary patching and open traffic within 6 hours of notification</td>
</tr>
<tr>
<td>Attendence in Road Accidents</td>
<td>Recovery works shall be completed within 60 days</td>
<td>Response within 90 minutes of notification during normal business hours</td>
</tr>
</tbody>
</table>

- Target level of percentage satisfying the performance criteria is 80% for all asset items
# Result of Survey

## Achievement and Target level of Performance Criteria

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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Routine Maintenance</td>
<td>Timeliness Requirement</td>
</tr>
<tr>
<td>Road Sweeping and Cleaning</td>
<td>OK=100%/80%</td>
<td>N/A</td>
</tr>
<tr>
<td>Vegetation Control</td>
<td>N/A</td>
<td>OK=99%/80%</td>
</tr>
<tr>
<td>Emergent Pothole Patching</td>
<td>N/A</td>
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<td>OK=99%/80%</td>
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Lessons Learned

1. All performance criteria were achieved
   - Higher target performance criteria?
   - Seek optimal performance criteria

2. Improvement of efficiency in maintenance was less than expected
   - Improve management ability
Next Actions

1. Seek Optimal target performance criteria
   • Check the relation between Outcome and Input

2. Improve management ability
   • NEXCO-West’s engineers have been dispatched to the group company
   • Proper incentives (bonus & penalty)

3. Expand application of this project
   • Another nine offices carry out in FY2010
     - high traffic, urban area, many bridges
Questions or Comments

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