Innovative Maintenance Strategies to Improve ITS Financing Capabilities

Kevin M. Barron
Director of Business Development
Digital Traffic Systems
Overview

• ITS maintenance in rural areas poses different challenges than in more urbanized areas

• Strategies exist to BOTH improve device health AND gain more budget certainty; improving ROI

• Performance-based contracting allows DOTs to meet both goals; healthier systems, more control over maintenance budget resources
Rural ITS Maintenance Challenges

Challenging Geography
Rural ITS Maintenance Challenges

Vast Distances Between Devices
Rural ITS Maintenance Challenges

Limited Availability of A/C Power
Rural ITS Maintenance Challenges

Limited Communications Options
Rural ITS Maintenance Challenges

Unique Safety Challenges
Rural ITS Maintenance Challenges

Unique Systems
Rural ITS Maintenance Challenges

Roadway Design
Innovative Rural ITS Maintenance Strategies

“So how do I design a maintenance program that improves the overall health of my ITS assets and provides better control over my maintenance budget?”

— Rural ITS Maintenance Engineer
The Golden Rule

“If you are going to invest in and procure ITS systems then you must maintain those systems to maximize your return on investment.”

– Wise old consultant

“Tell me more.”

– Rural ITS Maintenance Engineer
Unfortunately, maintenance should not be at the bottom but rather throughout the process to ensure the highest potential for long term ROI.
Step One: Design for Maintenance

- Usability
- Reliability
- Accessibility
- Maintainability
- Availability
- Portability
- Dependability

Design, Install, Maintain
Step Two:
Develop a Maintenance Plan

- Document maintenance activities
- Develop and maintain a cost database
- Maintain Design/Install as-buils
- Analyze Maintenance Requirements
- Analyze Staffing Requirements
- Prioritize Maintenance Needs
- Develop Maintenance Plan
Step Three: Develop An Outsourcing Strategy

Outsource contract types:

• Low bid
• Time & materials
• Performance-based contract

*In all cases, uniform performance standards must be established and maintained*
Outsource Options

- **Low bid**
  - You get what you pay for

- **Time & Materials**
  - I’ll keep fixing it because you keep paying me to do so

- **Performance-based**
  - RFP-based; qualifications & price
  - Pay for results
  - Many options, up to and including full turn-key service
P-based Contract Considerations

• Operational Factors
  – Critical systems
  – Response times v. down times
  – Time of year
  – Emergency response

• Management
  – Asset Management
  – Inventory & Configuration
  – Service database
  – Reliability data

• Preventative Maintenance
  – Periodic schedules by site by field device
  – Periodic definition

• Performance Factors
  – Incentive-based
  – Operation-based
  – Penalties
  – Risk/Rewards

• Warranties
  – Field device in warranty management

• Repairs
  – Stocking/inventory requirements
  – Repair times
Step Four: Use Technology to Your Advantage

• The road-trip not taken saves money

• Automated system monitoring

• Remote access, diagnostic and reset capabilities

• Alternatives to copper-based telco lines

• IP accessibility
What about that budget certainty?

- **Preventative Maintenance**
  - Based on asset type and manufacturer’s recommendations
  - Once or twice per year
  - Be prepared to conduct routine maintenance during PM cycle
  - *Fixed fee per year based on number and type of devices*
What about that budget certainty?

- **On-Call/Routine Maintenance**
  - Unlimited number of call-outs per year
  - Remote access and diagnostics reduces call-outs
  - No need to track or bill at FLHRs
  - No mobilization payments
  - *Fixed fee per year based on number and type of devices*
  - *Incentive-based payment approach aligns the contractor’s interests with your own*
Example: Incentive-based Program

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Method of Measurement</th>
<th>Maximum Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service Call Acknowledgement</td>
<td># of call responses within spec / # of total calls:</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>• 1 = 100% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 1 to 0.50 = 30% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 0.50 = 0%</td>
<td></td>
</tr>
<tr>
<td>Priority Group One Equipment (8 Hour Repair Time)</td>
<td># of repair actions within spec / # of repair actions requested:</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>• 1 = 100% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 1 = 0%</td>
<td></td>
</tr>
<tr>
<td>Priority Group Two Equipment (72 Hour Repair Time)</td>
<td># of call responses within spec / # of total calls:</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>• 1 = 100% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 1 to 0.50 = 30% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 0.50 = 0%</td>
<td></td>
</tr>
<tr>
<td>Priority Group Three Equipment (5 Business Day Repair Time)</td>
<td># of call responses within spec / # of total calls:</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>• 1 = 100% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 1 to 0.50 = 30% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 0.50 = 0%</td>
<td></td>
</tr>
<tr>
<td>Adherence to PM schedule</td>
<td># of PM actions completed within spec and PM schedule / # of PM actions scheduled:</td>
<td>40</td>
</tr>
<tr>
<td></td>
<td>• 1 = 100% of</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Less than 1 = 0%</td>
<td></td>
</tr>
<tr>
<td>Total Maximum Points</td>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>
Results of Performance-based Contract Approach

- Known fixed cost to DOT
- Known risk to DOT – contractor assumes all risk
- Guaranteed maximum price to DOT
- Fixed fee with incentive-based payment schedule incentivizes contractor to meet DOT performance goals as efficiently as possible and maximize overall system health
- Task order capability for device replacements / upgrades
- Higher system availability
- Improved operational capabilities
Kevin M. Barron
Director of Business Development
Kevin.Barron@DTSITS.com
703.231.0207

David B. Ludwig
Director of ITS Programs
David.Ludwig@DTSITS.com
804.237.9380