




Traffic Operations Asset Management Systems



7th National Conference on Transportation Asset Management

Jason Bittner & Teresa Adams
 University of Wisconsin-Madison

Outline

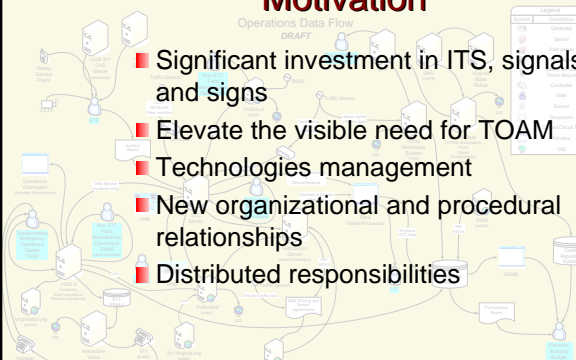

- Motivation for Operations Asset Management
- Previous National Activities
- What is TOAMS?
- Phase I Survey
- Peer Exchange Planning
- Phase II Survey
- Next Steps and Schedule

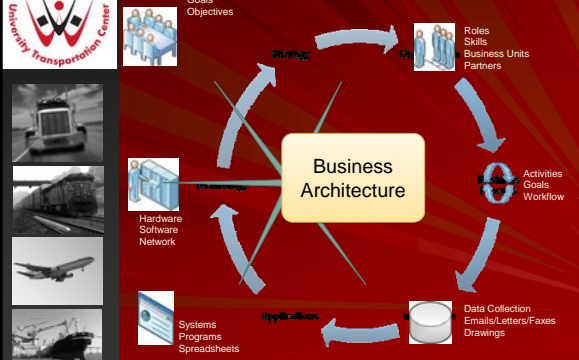
Motivation

Operations Data Flow DRAFT

- Significant investment in ITS, signals and signs
- Elevate the visible need for TOAM
- Technologies management
- New organizational and procedural relationships
- Distributed responsibilities





Business Architecture





Context

- Importance of Operations
- Value of equipment
- Skill sets not always compatible with traditional maintenance personnel

Previous Efforts

- FHWA Identification of Operations Assets (September 2005)
 - Framework
 - Categorization
- Elements of a Comprehensive Signals Asset Management System (Dec 2004)
- Signal Systems Asset Management State-of-the-Practice Review (Apr 2004)
- NCHRP Synthesis 37-03 (signs, markings, signals)






Categories of Operations Assets



Operations Asset Components




Project Definition

- MRUTC selection process
- TAM Pooled Fund
- Selected Spring 2007
- Focus on Physical & Systems Assets
- Components
 - Survey
 - Planning Meeting
 - Peer Exchange




What is TOAM?

- Asset management for:
 - Traffic Control Devices
 - Traffic Management Systems
- Integrates
 - asset management
 - configuration management




Characteristics of traffic operations assets

- Active and dynamic
 - Signs, signals and ITS devices
- Related tangible and intangible components
 - communications links, networks, servers, fiber optics, data, software versions
- Monitoring and condition assessment characteristics
 - “bath tub” mortality curve
 - Average time to failure
 - Technical obsolescence
 - Field maintenance



Phase I Survey

- May 2007 survey
 - 40 questions
- 15 responses
- **Sample Survey Questions**
 - Does your agency have formal systems?
 - What are your agency's primary motivations for implementing formal systems?
 - How is it being used?



Does your agency have a formal process?


- 5 states identified formal processes
- 2 said no
- 7 informal



Primary motivations for implementing or considering?

- Provide an internal analytical and management tool
- Legislative mandate
- Increase accountability to legislature
- Provide an integrated asset management system








How is your program being used?

- Assess roadway safety (e.g. surface condition, roadway design)
- Assets condition and preservation
- Budget allocation for maintenance, improvement or new project
- Enhanced techniques and decision-making accountability
- Legislative reporting (justify maintenance budgets and requests)
- Maintain assets pertinent information
- Maintenance policy analysis (establish maintenance standards)
- Maintenance work planning
- Resource allocation within and across different jurisdictions
- Facilitate regional/multi-agency coalitions
















Topics of interest

- Elaborating analysis capabilities
- Life-cycle cost analysis
- Needs-based analysis on performance measurement
- Alternative investment scenario assessment
- Integration into overall asset management process
- Promoting systems approach to become the way of doing business

Setting in Madison

- Partnership between
 - Subcommittee on Maintenance (SCOM)
 - Subcommittee on Systems Operation and Management (SSOM)
- MRUTC Project selected for Grant Year 8








Peer Exchange Planning Group

- Sponsors
 - Midwest Regional University Transportation Center at University of Wisconsin
 - Transportation Asset Management Pooled Fund Research Program
 - Wisconsin DOT
 - Michigan DOT
 - New York DOT












Phase II Survey


- Distributed in September
- Expanded to SCOTE Members
- Class activity




Components / Systems

- CCTV Cameras (traffic surveillance)
- Pavement Sensors (temperature)
- Loop Detectors (traffic count, occupancy and speed)
- VMS Signal System (signal heads, controllers)
- 511 Telephone Dial-in Service
- Automated Crash Notification System
- Advanced Traveler Information System
- Advanced Traffic Management System
- Incident Management System
- Road Weather Information System




Sample Questions



- Maintenance policy?
 - Preventive -- Corrective
 - Inspection -- Replacement
- Importance of:
 - Repair/replace -- Upgrade
 - Condition assessment -- Training, etc.
- Data kept
 - Characteristics / Capabilities
 - Maintenance Requirements
 - Maintenance Cost
 - History Repair / Failure History
 - Age / Condition

Sample Questions

7. Does your agency have any of the following formal process applied to the components listed? Check all that apply



	CCTV Cameras	Pavement Sensors	Loop Detectors	VMS Controllers	Signal System	511 Telephone Dial-in Service
Budget planning for maintenance and replacement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Field equipment inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Spare parts inventory	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Maintenance record and management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Performance monitoring	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Estimate personnel needs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Make assessment on deficiencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Make purchase decisions(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Perform life-cycle cost analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Propose new improvement project	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Schedule maintenance repair and/or replacement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Communications Network Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Written Guidelines	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dedicated staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Others	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Sample Questions



16. Rate the current importance of these operational issues for your transportation agency? (1=Very Important, 5=Not Important)

	1	2	3	4	5
Adjust / Upgrade existing infrastructure system	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Coordinate agencies across jurisdictions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Deploy more system management on ITS facilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Develop a computerized system management module	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Expand system capabilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Multi agencies coalition, both transportation and non-transportation agencies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More infrastructure system installation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Prioritizing and scheduling maintenance of ITS systems and components	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improve technology integration of ITS system technology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

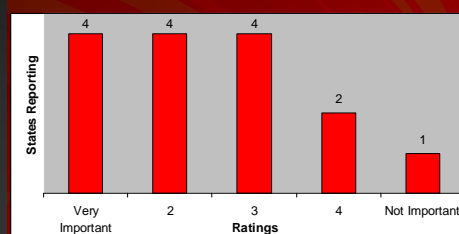



Preliminary Responses


- 15 states, 23 respondents
- Early respondents are geographically dispersed with East (3), West (5), South (2) and Midwest (5) states represented.
- 8 states did not indicate preventive maintenance activities for ITS components

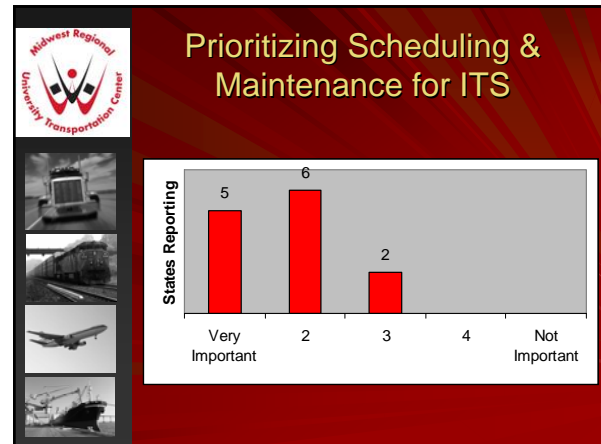
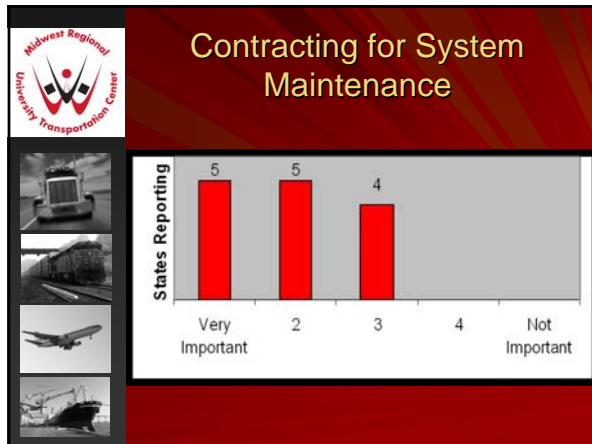



Develop Computerized Management Systems



Rating	States Reporting
Very Important (1)	4
2	4
3	4
4	2
Not Important (5)	1





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- Other**
- Possible topics of interest:
 - Obsolescence planning
 - Outsourcing
 - ITS MMS
 - PPP/contracting


Responses

- “I found very different opinions about how people suggest we answer the questions in your survey. Some think we have no process for certain things, others believe we do. It demonstrated the areas where we have some work to do on communicating with each other across the agency.”

Responses






Currently our inventory is done manually. Our maintenance of devices is in the hands of each one of our 11 engineering districts offices. They each maintain their own maintenance agreements; this is an area I want to improve. We are currently developing ITS device uptime standards and metrics”

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- Observations**
- Crosses agency silos/functional areas
 - Varied responses; varied sophistication
 - Challenges on getting accurate agency responses








Next Steps // Schedule of Activities

- Phase II Survey (responses were due November 8 TODAY)
- Gap Analysis and Scan
- TOAM Peer Exchange and Workshop (Spring 2008, Milwaukee)






Peer Exchange Outcomes

- Develop best practices for maintenance of ITS equipment and systems
- Integrate management of traffic operations assets into the overall asset management system
- Develop strategic investment scenarios
- Longer-term
 - Multi-state Pilot
 - Pooled fund to develop management tools
 - Work with industry

Who is involved

- States:
 - Wisconsin DOT
 - Washington DOT
 - Oregon DOT
 - Indiana DOT
 - Alabama DOT
 - Caltrans
 - Virginia DOT
- AASHTO

Proposed Format & Agenda

- 1.5 days
- Survey results and analysis
- 4 case studies
 - Systems
 - Success factors
 - Investment strategies
- Identify gaps and assess needs
- Consider next steps







Acknowledgements

- Student staff
 - Dadit Hidayat, Andrea Bill, Kelvin Santiago, Luis Laracuente
- Wisconsin DOT
- AASHTO Staff
 - Valerie Briggs
 - Ken Kobetsky/Marty Vitale







Get Involved

- Transportation Asset Management Pooled Fund
- Planning teleconferences open
- Contact:
 - Jason Bittner
bittner@enr.wisc.edu
 - Teresa Adams
adams@enr.wisc.edu

