Transportation System Management and Operations: Achieving the Vision in the Treasure Valley

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May 9, 2014
Workshop Objective

Discuss the Treasure Valley’s updated vision for transportation operations and technology...

…and how it can be applied to address the transportation needs of the region.
Workshop Agenda

• What is Transportation System Management and Operations, and why is it relevant to the Treasure Valley?

• What is the Regional Operational Vision for the Treasure Valley?

• How do we achieve the Vision?

• Discussion
What is Transportation System Management and Operations?
What is Transportation System Management and Operations?

“An integrated program to optimize the performance of the existing infrastructure through implementation of multi-modal, cross-jurisdictional systems, services, and projects designed to preserve capacity and improve security, safety, and reliability of transportation systems.”

– Federal Highway Administration
Many Existing Examples in the Treasure Valley

- Incident Management
- Traveler Information
- Event Management
- Freeway and Arterial Traffic Management
- Transit Management
- Winter Maintenance

...and more...
Isn’t TSMO the same as
“Intelligent Transportation Systems (ITS)?”
Ingredients of a Successful TSMO Program

ITS is the enabling technology, but TSMO emphasizes elements of success to meet our operational objectives.
Why is TSMO Relevant to the Treasure Valley?
A Critical Transportation Challenge in the Treasure Valley

- The transportation network is not growing as fast as population

- Levels of transportation funding are diminished and uncertain
Public Road Mileage, Lane-Miles, and VMT
1980 - 2010

- **Lane-Miles**
- **Vehicle-Miles of Travel**
- **Public Road Mileage**


Values:
- Millions: 3.5, 8.0, 9.0
- Trillions: 2.0, 3.0
- Public Road Mileage: 0.5, 0.6
- Lane-Miles: 7.0, 9.0
- Vehicle-Miles of Travel: 3.0, 6.0

(IBI GROUP)
Operational Issues – Leading Cause of Traffic Congestion

The common causes of congestion cannot be practically addressed solely by expanding capacity.
The ITS and communications infrastructure investments of the past provide a significant foundation for future operational efforts.
Agencies are Seeking Affordable Solutions

Road Widening vs. Advanced Traffic Signal Coordination
Operations Partnerships Exist (….and are Growing!)
What is the Regional Operational Vision for the Treasure Valley?
Towards a New Operational Vision for the Treasure Valley

• Build on past accomplishments and investments to address emerging opportunities and challenges

• Strengthen institutional partnerships and relationships

• Raise awareness of operations benefits

• Link operations to regional planning and project development

• Prepare an implementation plan to guide investment over the next ten years
Towards a New Regional Operations Vision

Where do we envision ourselves ten years into the future?

What are the most critical opportunities and operations challenges facing our region?

How can operations contribute to meeting regional transportation goals?

What’s worked well in the past, and what might we do differently?
“Provide active management of the Treasure Valley’s multimodal transportation system through agency partnerships and investment in ITS technology as an essential regional strategy to maximize the performance of the transportation system.”
CHAPTER 3: EXISTING CONDITIONS

Key Message: There is an extensive existing network of ITS and communications investments, as well as institutional infrastructure to leverage for future needs.
CHAPTER 4: NEEDS ASSESSMENT

**Key Message:** Meeting the future needs of the Treasure Valley requires a regional approach to ITS and operations. Needs vary significantly between Ada and Canyon Counties, but there are many common themes across jurisdictions, agencies, and modes.

<table>
<thead>
<tr>
<th>NEED</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td><strong>IMPROVED COORDINATION WITH LOCAL FIRST RESPONDERS (POLICE/FIRE)</strong></td>
<td>Local police, fire, and ambulance are often involved in response to regional traffic incidents. As such, it is important that these responders have training and capabilities in appropriate coordination with traffic management personnel at the region’s traffic management centers. This includes notification of incident clearance so that traveler information systems and traffic control systems can be updated as congestion clears.</td>
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<tr>
<td><strong>COORDINATED BI-COUNTY INCIDENT AND EVENT MANAGEMENT</strong></td>
<td>With the increasing urbanization of the Treasure Valley, there is a growing need to coordinate incident and event management between Ada and Canyon Counties. Events at the Idaho Center in Nampa were cited as an example of an event type with impacts across the two counties.</td>
</tr>
<tr>
<td><strong>CCTV SHARING AND MANAGEMENT PROTOCOLS</strong></td>
<td>Public safety agencies acknowledge the high value in access to traffic cameras for incident verification, special events, and emergency response; however, lead agencies need to have the ability to temporarily block camera access in particular situations, especially to prevent public or media dissemination of incident camera feeds.</td>
</tr>
</tbody>
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CHAPTER 5: REGIONAL OPERATIONS STRATEGIES AND CORRIDORS

Regional TSMO Toolkit

Key Message:

A diverse “toolkit” of operational strategies is available to address the identified needs of the Treasure Valley.

Corridor-level needs and priorities form a basis of the ITS Implementation Plan.
CHAPTER 6: OPERATIONAL CONCEPT

Key Message:

Delivering operations strategies at the regional level requires interagency cooperation. This includes existing and new roles for transportation and emergency management agencies, which may need to be documented through future RCTOs and agreements.
CHAPTER 7: TREASURE VALLEY ITS ARCHITECTURE

Key Message:

The Treasure Valley has a new, updated ITS Architecture consistent with USDOT requirements.

The architecture reflects current needs and infrastructure, and anticipates future functional and geographic growth.
CHAPTER 8: COMMUNICATIONS PLAN

**Key Message:**

Regional communications infrastructure management, through partnerships and formalize processes, is critical for efficiency and cost-effectiveness.

The Implementation Plan reflects future communications needs to support ITS/operations.

### Needs Identified – Regional Communications Infrastructure Management

<table>
<thead>
<tr>
<th>Need</th>
<th>Description</th>
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<tbody>
<tr>
<td>Established of Clear Ownership and Maintenance Responsibilities</td>
<td>Historically, the deployment of fiber optic infrastructure has been ad hoc and opportunistic—for example, the Canyon County Sheriff owns fiber optic infrastructure in ITD's I-84 right of way. There is a need for better understanding of ownership and maintenance responsibilities for the region's fiber optic infrastructure to manage both available capacity and upkeep.</td>
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<tr>
<td>Work Group for Regional Fiber Optic Communications</td>
<td>Stakeholders identified a need for a collaborative body to promote ongoing interagency coordination on fiber optic infrastructure deployment, operations, and maintenance.</td>
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<td>Formalize Processes for Fiber Infrastructure Sharing</td>
<td>Rather than the existing ‘handshake’ agreements, stakeholders noted the need for clearer and more formalized procedures for fiber sharing agreements through a regional process.</td>
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<tr>
<td>Fiber Maintenance Service Level Agreements</td>
<td>Agencies that rely on another agency's fiber for critical functions need the assurance through a written service level agreement (SLA) that the host agency will promptly address maintenance responsibilities, e.g., if a fiber optic cable is cut or switching equipment required replacement. SLAs should be part of any new formalized agreements.</td>
</tr>
<tr>
<td>Need for Fiber Connectivity in Canyon County</td>
<td>Currently, there is a lack of fiber communications connectivity in Canyon County between centers and to field devices. As ITS deployment and opportunities grow, so must the fiber backbone and provisioning for future expansion of the system (e.g., installing conduit).</td>
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</tbody>
</table>
CHAPTER 9:
LINKING PLANNING AND OPERATIONS

Key Message:
Linking operations and planning provides increase visibility of opportunities, benefits, and funding needs.

Planning will benefit from access to transportation operations data through a regional data archive

- Linking Operations and Long Range Planning
- Linking Operations and the Congestion Management System
- Linking Operations and Project Development
- Use of Operations Data for Planning and Performance Measurement
- Regional Operations Coordination – “Planning for Operations”
### CHAPTER 10: REGIONAL OPERATIONS PERFORMANCE MEASURES

#### Key Message:

ITS data can provide 24/7 insight into the performance of the transportation system, particularly non-recurring congestion.

A coordinated approach to field detection and regional data archiving will vastly expand the scope of available planning/PM applications.

<table>
<thead>
<tr>
<th>CANDIDATE PERFORMANCE MEASURES</th>
<th>AVAILABLE DIRECTLY</th>
<th>REQUIRES CALCULATION</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCIDENT RESPONSE</td>
<td></td>
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<tr>
<td>INCIDENT DURATION</td>
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<tr>
<td>TRAVEL TIME</td>
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<td>AVERAGE TRAVEL TIME</td>
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<td>AVERAGE SPEED</td>
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<tr>
<td>RECURRING DELAY</td>
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<tr>
<td>VEHICLE DELAY</td>
<td>✓</td>
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<tr>
<td>NON-RECURRING DELAY</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>VEHICLE DELAY</td>
<td>✓</td>
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<tr>
<td>HOURS OF CONGESTION</td>
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<tr>
<td>DURATION OF CONGESTION</td>
<td>✓</td>
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<tr>
<td>THROUGHPUT - VEHICLE</td>
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<tr>
<td>VEHICLE VOLUME PER HOUR</td>
<td>✓</td>
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<tr>
<td>GREENHOUSE GAS EMISSIONS</td>
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<tr>
<td>VEHICLE EMISSIONS - CO, NO, VOC</td>
<td>✓</td>
<td></td>
<td></td>
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<tr>
<td>TRANSIT SIGNAL PRIORITY</td>
<td></td>
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<tr>
<td>NUMBER OF TRANSIT PRIORITY REQUESTS</td>
<td></td>
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<tr>
<td>TRANSIT PRIORITY EVENTS SERVED</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DURATION OF GREEN TIMES</td>
<td>✓</td>
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</tbody>
</table>

Incident triggers must be set up to provide start time and stop time.

LOS and V/C ratios are provided by intersection for selected time period.
Cycle and green time are available to allow for an automated HCM calculation.

LOS and V/C ratios are provided by intersection for selected time period.

Available by lane, by intersection, or by occupancy for selected time period.

Available by intersection for selected time period (resolution down to one minute).

May be calculated from average travel time and average speed.

With transit priority module, a report is provided. Without transit priority module the measure equals the number of buses requesting priority regardless of whether they have been served.

With transit priority module a report is provided.

Provided as a report or can be watched with real-time graphical split monitoring.
**CHAPTER 11: ITS IMPLEMENTATION PLAN**

**Key Message:** The Treasure Valley has a ten-year project plan for ITS and communications implementation to support regional operations strategies. The plan supports strategic and opportunistic implementation.

<table>
<thead>
<tr>
<th>Project Names and IDs</th>
<th>Lead Agency or Agencie</th>
<th>Est. Calendar Year</th>
<th>Planning-Level Cost Estimate (Sr. 2015)</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RC 1</td>
<td>Establish and Maintain Regional Operations Working Group</td>
<td>COMPASS</td>
<td>Ongoing (2013+)</td>
<td>$250K/year</td>
</tr>
<tr>
<td>RC 2</td>
<td>Create Interagency Agreements for ITS Management and Operations</td>
<td>COMPASS</td>
<td>2014</td>
<td>$50K</td>
</tr>
<tr>
<td>RC 3</td>
<td>Performance Measurement Regional Concept for Transportation Operations (RCTO-PM) and Data Infrastructure Strategy</td>
<td>COMPASS</td>
<td>2014</td>
<td>$25K</td>
</tr>
<tr>
<td>RC 4</td>
<td>Transportation System Management and Operations Performance Assessment</td>
<td>COMPASS</td>
<td>2015</td>
<td>$25K</td>
</tr>
<tr>
<td>RC 5</td>
<td>Update/Develop Standard Specifications for ITS and Communications Infrastructure</td>
<td>ITD DS/ACOM</td>
<td>2015</td>
<td>$50K</td>
</tr>
</tbody>
</table>
How do we achieve the Vision?
Priorities for Operations Agencies

- Jointly pursue innovative funding sources and build sustainable funding
- Develop Regional Concepts for Transportation Operations
- Develop formalized interagency agreements
- Implement priority project
- Build awareness of operational needs and opportunities
- Maintain the TSMO plan as a living document
Treasure Valley Regional Operations Work Group

• A voluntary, multi-agency initiative to promote the coordinated management and operation of the region’s multi-modal transportation infrastructure.

• Organized to provide ongoing collaboration among operations partners and to implement recommendations of the Plan

• Next meeting: July 10, 2014, 1:30-4:00 at COMPASS
Regional Communications Infrastructure Management

- Working group formed to develop a structure and agreement for regional management of fiber optic communications infrastructure

- Goals of cost savings and improved performance

- Diverse coalition of communications system users

- Next meeting: June 2014 (TBD)
How Can Transportation Professionals Use the Plan?

- Identify the linkage between operational strategies and regional/project planning goals
- Identify whether corridors of interest to your project are operationally significant to the region
- Identify potential low-cost, near-term operational strategies and ITS technologies to address the needs of the project
How Can Transportation Professionals Use the Plan?

- Identify potential partners for project implementation, grant pursuit, funding, or long-term operations.
- Identify opportunities to co-invest in ITS infrastructure.
- Use data generated by ITS systems to support project analysis and performance measurement.
The plan is available at www.compassidaho.org
Conclusion: Key Messages

- The Treasure Valley has an **up-to-date vision** and investment strategy to effectively operate the multi-modal transportation system.
- TSMO strategies are **relevant to regional goals** and the needs of many communities and corridors.
- TSMO may provide **cost-effective alternatives or complements** to other transportation investments in the region.
- The vision is consistent with and **integrated into the region’s long range transportation plan**.
- Operations agencies **stand ready to partner** to achieve the vision and address common needs.
Questions?
Thank You
For your interest and participation!