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

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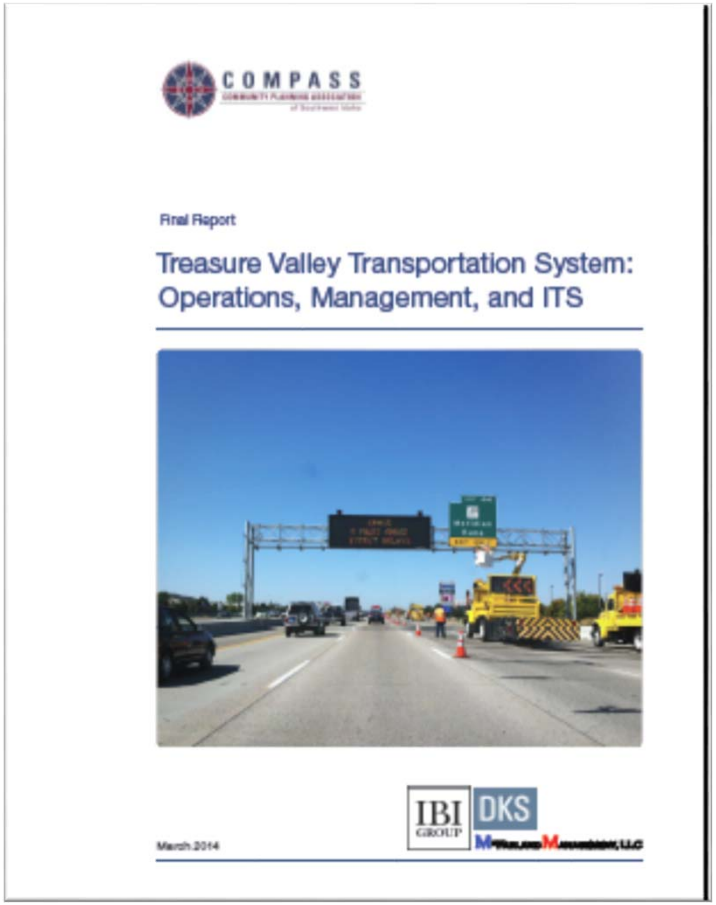
Workshop Objective

Discuss the Treasure Valley's updated vision for transportation operations and technology…

…and how it can be applies 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

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What is Transportation System Management and Operations?

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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

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Many Existing Examples in the Treasure Valley

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

…and more…

511 Travel Info

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Isn’t TSMO the same as

“Intelligent Transportation Systems (ITS)?”

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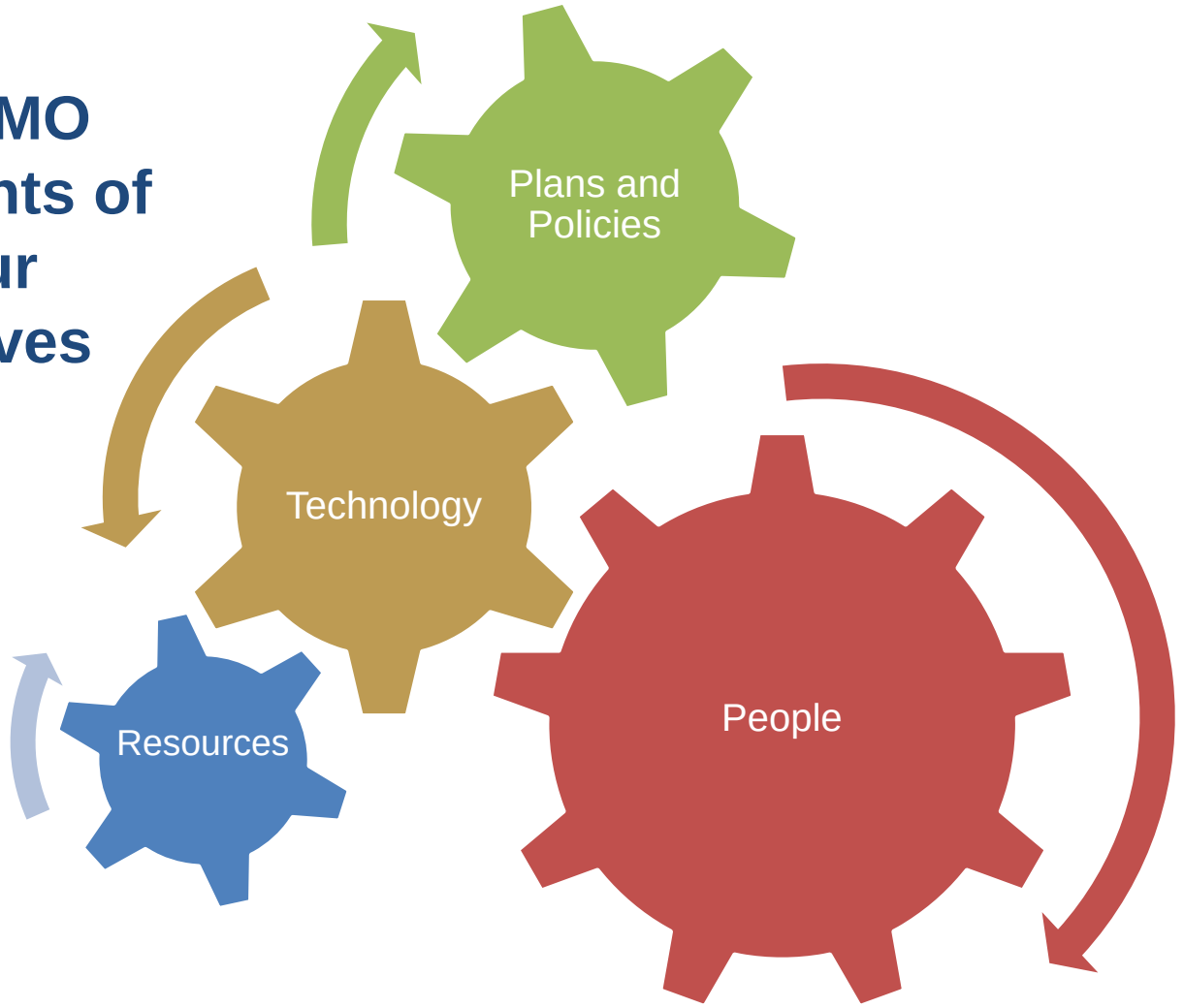
Ingredients of a Successful TSMO Program

ITS is the enabling technology, but TSMO emphasizes elements of success to meet our operational objectives



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Why is TSMO Relevant to the Treasure Valley?

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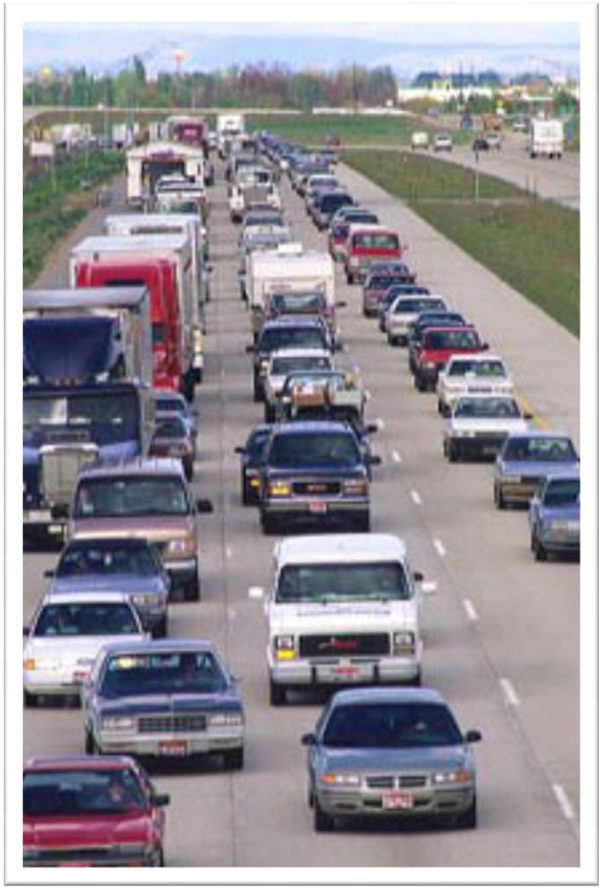
A Critical Transportation Challenge in the Treasure Valley



- The transportation network is not growing as fast as population
- Levels of transportation funding are diminished and uncertain

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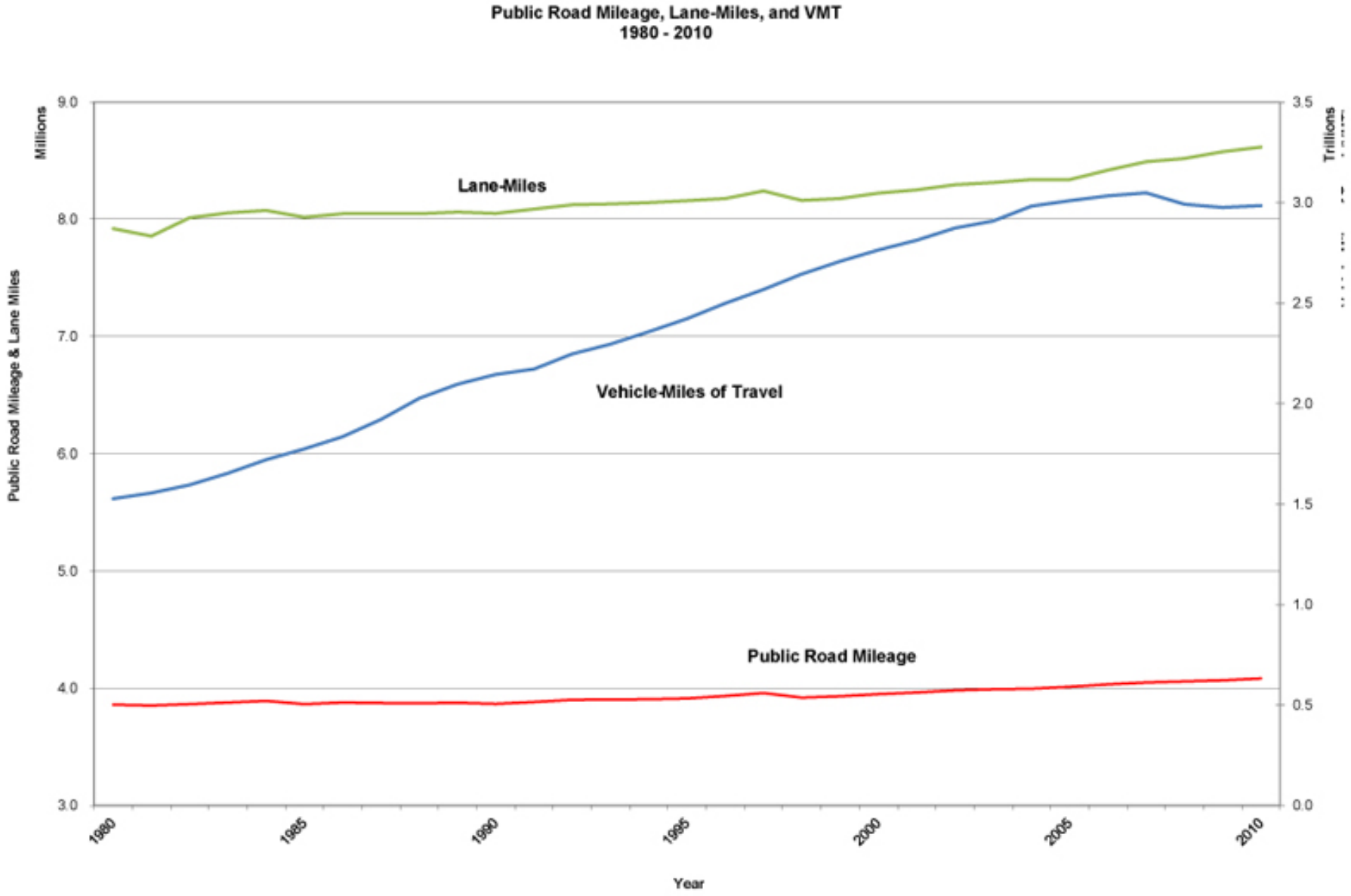
Public Road Mileage, Lane-Miles, and VMT
1980 - 2010
Millions
Trillions
Public Road Mileage & Lane Miles
Lane-Miles
Vehicle-Miles of Travel
Public Road Mileage
9.0
8.0
7.0
6.0
5.0
4.0
3.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
1980
1985
1990
1995
2000
2005
2010
Year

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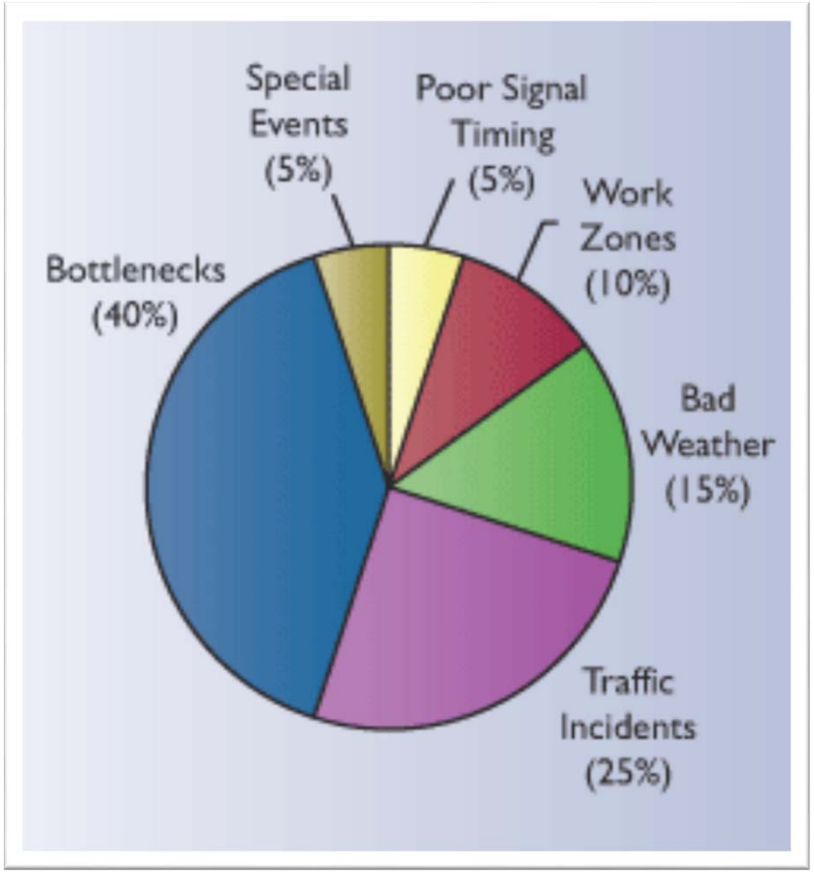
Operational Issues – Leading Cause of Traffic Congestion



The common causes of congestion cannot be practically addressed solely by expanding capacity.

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The ITS and communications infrastructure investments of the past provide a significant foundation for future operational efforts

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Agencies are Seeking Affordable Solutions

Road Widening

vs.

Advanced Traffic Signal Coordination

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Operations Partnerships Exist (….and are Growing!)

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What is the Regional Operational Vision for the Treasure Valley?

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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

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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?

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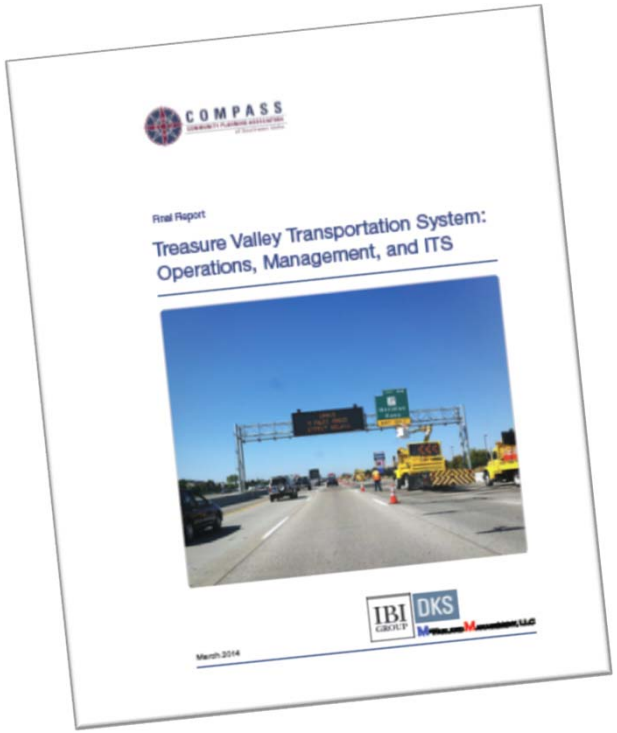
Operational Vision for the Treasure Valley

"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."



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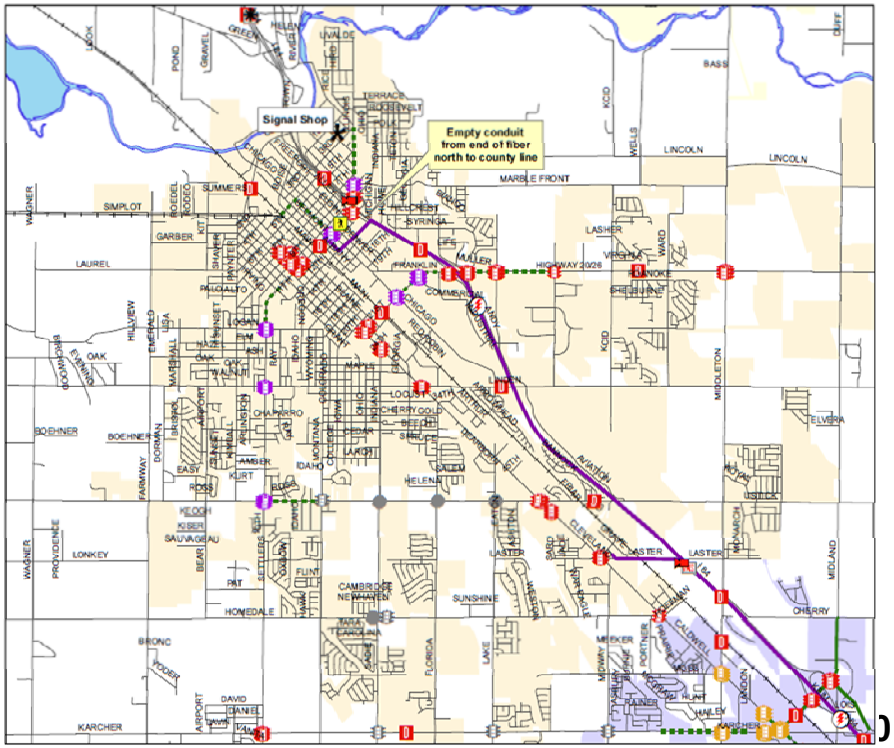
CHAPTER 3:
EXISTING CONDITIONS

	TRAFFIC MANAGEMENT				INCIDENT & MANA	
	Traffic Surveillance	Freeway Management	Arterial Management	Enhanced Traffic Signal Operations	Regional Incident and Emergency Management	Preemption
TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS						
ITD DISTRICT 3	●	●	●	●	●	
ACHD	●	●	●	●	●	
CANYON COUNTY			●		●	
CITY OF CALDWELL			●	●	●	
CITY OF NAMPA	●		●	●	●	
BOISE AIRPORT			●		●	
BOISE STATE UNIV.	●		●			
EMERGENCY MANAGEMENT AGENCIES						
IDAHO STATECOMM	●				●	
911	●				●	
IDAHO STATE POLICE	●				●	
LOCAL FIRST RESPONDERS					●	
PUBLIC TRANSPORTATION MANAGEMENT AGENCIES						
VALLEY REGIONAL TRANSIT					●	
TREASURE VALLEY TRANSIT					●	

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



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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.

NEEDS IDENTIFIED – INCIDENT AND EMERGENCY MANAGEMENT	
NEED	**DESCRIPTION**
IMPROVED COORDINATION WITH LOCAL FIRST RESPONDERS (POLICE/ FIRE)	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.
COORDINATED BI-COUNTY INCIDENT AND EVENT MANAGEMENT	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.
CCTV SHARING AND MANAGEMENT PROTOCOLS	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.

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CHAPTER 5:
REGIONAL OPERATIONS STRATEGIES AND CORRIDORS

Regional TSMO Toolkit

REGIONAL OPERATIONS COORDINATION AND PLANNING
- Multi-Agency Operations Coordination and Planning

REGIONAL TRANSPORTATION MANAGEMENT
- Traffic Surveillance
- Regional Traffic Management
- Transportation Demand Management
- Roadside Lighting
- Railroad Grade Crossings

FREEWAY MANAGEMENT
- Ramp Metering
- Active Traffic Management

ARTERIAL MANAGEMENT
- Enhanced Traffic Signal Operations
- Pedestrian and Bicycle Operations and Safety

INCIDENT AND EMERGENCY MANAGEMENT
- Regional Incident and Emergency Management
- Emergency Vehicle Routing and Signal Preemption
- Regional Alert System

TRAVELER INFORMATION
- Roadside Traveler Information Dissemination
- Regional Traveler Information
- Trip Planning and Routing Website
- Parking Availability Information and Guidance

PUBLIC TRANSPORTATION MANAGEMENT
- Advanced Transit Operations Management
- Regional Transit Fare Integration
- Transit Surveillance and Security
- Multi-Modal Travel Coordination
- Real-time Transit Information
- Transit Signal Priority (TSP)

ROAD WEATHER OPERATIONS
- Road Weather Information Systems (RWIS)
- Weather-Adaptive Traffic Management
- Winter Roadway Maintenance

MAINTENANCE AND CONSTRUCTION
- Maintenance and Construction Management
- Work Zone Management

REGIONAL DATA ARCHIVING
- Regional Transportation Data Archive

REGIONAL COMMUNICATIONS INFRASTRUCTURE MANAGEMENT
- Communications Infrastructure Coordination

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.

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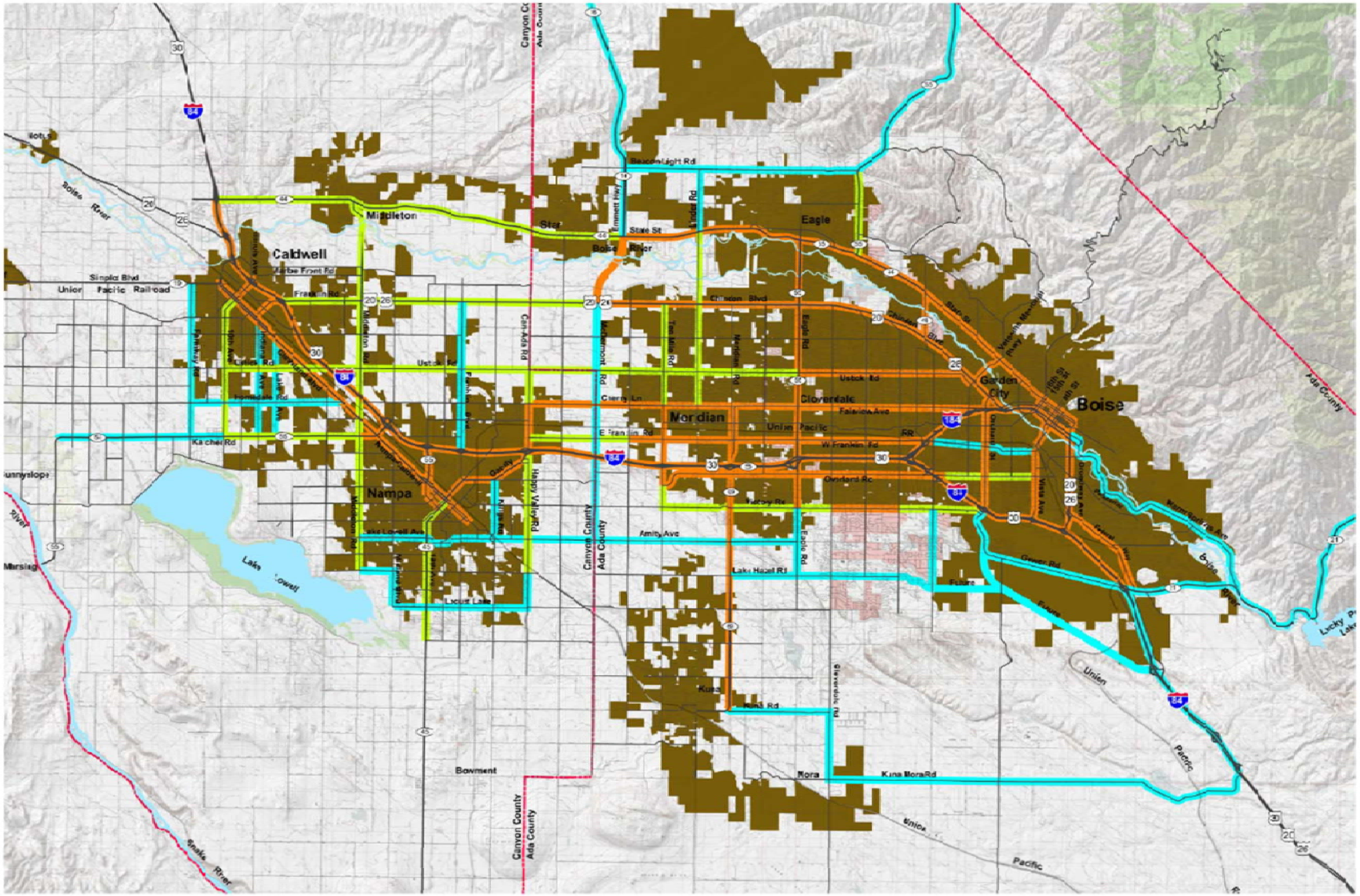
Figure ES-1 Treasure Valley Operations Priority Corridors



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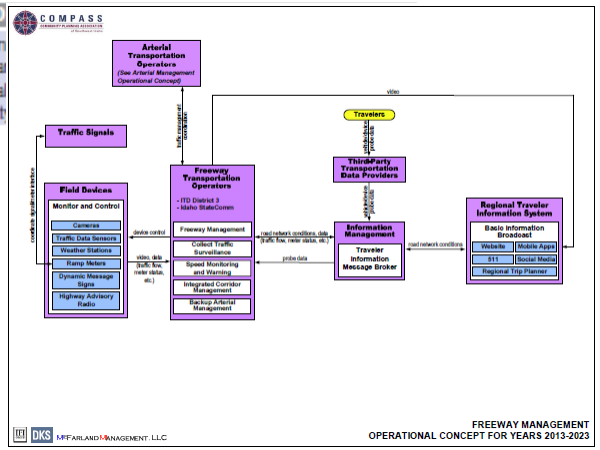
CHAPTER 6:
OPERATIONAL CONCEPT

Freeway Management

OPERATIONAL SERVICE	DESCRIPTION
FREEWAY MANAGEMENT	Describes routine monitoring and operations of the regional freeway system.
REGIONAL OPERATIONS STRATEGIES INCLUDED	• Freeway traffic monitoring and management • Freeway traveler information • Traffic data collection

CURRENT FUNCTIONS	FUTURE ADDITIONAL FUNCTIONS
• Monitor ongoing freeway traffic flow and performance • Coordinate freeway maintenance and construction activity • Collect freeway traffic flow/count/ classification information from freeway data count stations • Provide freeway traveler information through freeway Dynamic Message Signs (DMS), Highway Advisory Radio (HAR), and Statewide 511 web/ mobile tools	• Operate regional ramp metering system • Coordinate freeway ramp flows with adjacent traffic signal systems • Coordinate operations of freeways with adjacent/feeder arterials (Integrated Corridor Management) • Provide estimated freeway travel time information on DMS signs • Provide backup locations/capabilities for the StateComm TMC and ITD District 3 • Active Traffic Management

CURRENT STAKEHOLDERS	FUTURE AD
• StateComm • ITD District 3 • ACHD (network maintenance)	• Ada Coun • City of Na • City of Cal • Third-Part



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.

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CHAPTER 7:
TREASURE VALLEY ITS ARCHITECTURE

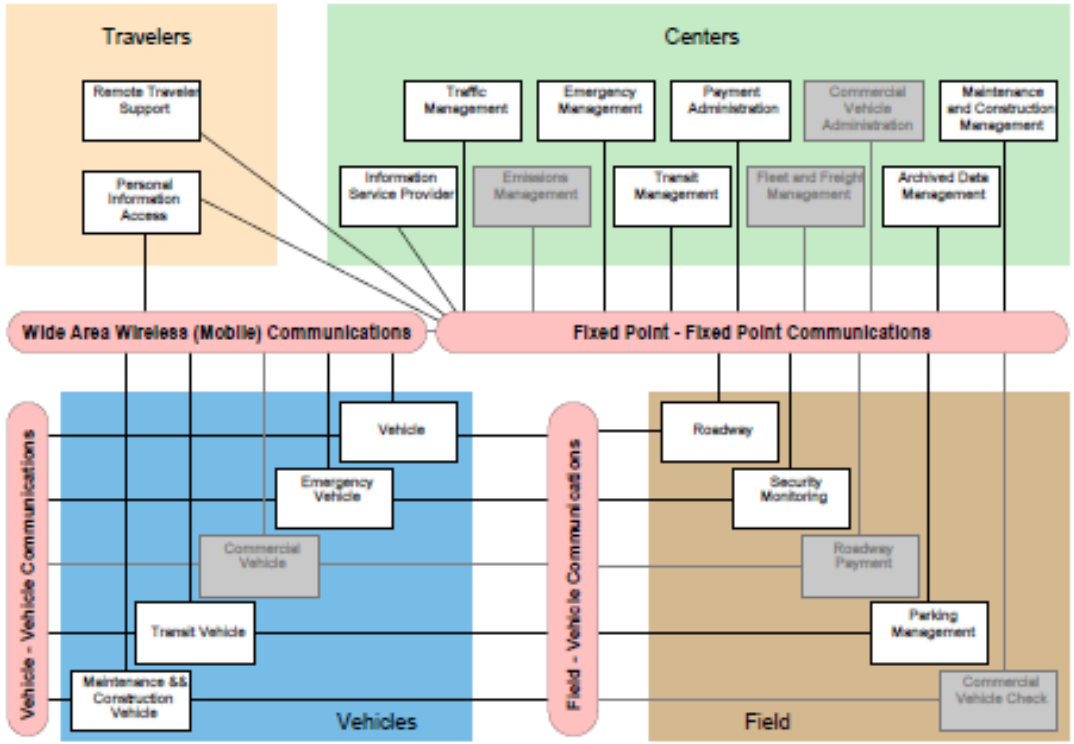

Figure 7–2: National ITS Architecture Subsystems

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.

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CHAPTER 8:
COMMUNICATIONS PLAN

NEEDS IDENTIFIED – REGIONAL COMMUNICATIONS INFRASTRUCTURE MANAGEMENT	
NEED	**DESCRIPTION**
ESTABLISHMENT OF CLEAR OWNERSHIP AND MAINTENANCE RESPONSIBILITIES	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.
WORK GROUP FOR REGIONAL FIBER OPTIC COMMUNICATIONS	Stakeholders identified a need for a collaborative body to promote ongoing interagency coordination on fiber optic infrastructure deployment, operations, and maintenance.
FORMALIZE PROCESSES FOR FIBER INFRASTRUCTURE SHARING	Rather than the existing 'handshake' agreements, stakeholders noted the need for clearer and more formalized procedures for fiber sharing agreements through a regional process.
FIBER MAINTENANCE SERVICE LEVEL AGREEMENTS	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.
NEED FOR FIBER CONNECTIVITY IN CANYON COUNTY	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).

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.

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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”

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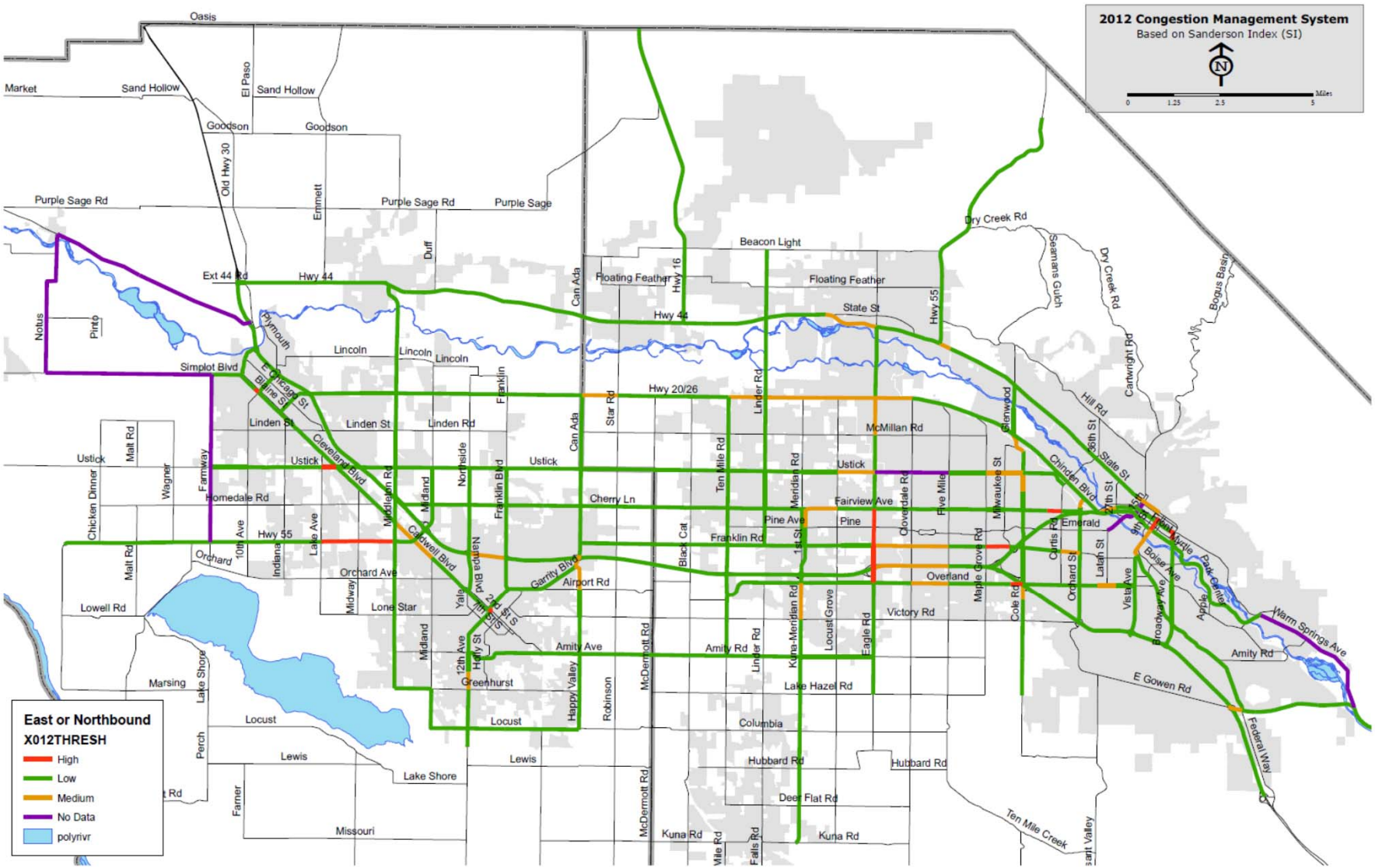

Figure 9–1: Treasure Valley CMS Corridor Weekday Peak Hour Rankings (East or Northbound) – 2012

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CHAPTER 10:
REGIONAL OPERATIONS PERFORMANCE MEASURES

CANDIDATE PERFORMANCE MEASURES		AVAILABLE DIRECTLY	REQUIRES CALCULATION	NOTES
INCIDENT RESPONSE	INCIDENT DURATION	✓		Incident triggers must be set up to provide start time and stop time
TRAVEL TIME	AVERAGE TRAVEL TIME		✓	
	AVERAGE SPEED	✓		
RECURRING DELAY	VEHICLE DELAY	✓		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
NON-RECURRING DELAY	VEHICLE DELAY	✓		LOS and v/c ratios are provided by intersection for selected time period
HOURS OF CONGESTION	DURATION OF CONGESTION	✓		Available by lane, by intersection, or by occupancy for selected time period
THROUGHPUT – VEHICLE	VEHICLE VOLUME PER HOUR	✓		Available by intersection for selected time period (resolution down to one minute)
GREENHOUSE GAS EMISSIONS	VEHICLE EMISSIONS – CO, NO_x, VOC		✓	May be calculated from average travel time and average speed
TRANSIT SIGNAL PRIORITY	NUMBER OF TRANSIT PRIORITY REQUESTS	✓		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
	TRANSIT PRIORITY EVENTS SERVED	✓		With transit priority module a report is provided
	DURATION OF GREEN TIMES	✓		Provided as a report or can be watched with real-time graphical split monitoring

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.

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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.

	Project Names and IDs	Lead Agency or Agencies	Est. Calendar Year	Planning-Level Cost Estimate ($k, 2013)	Project Description
Regional Operations Coordination and Planning (RC)					
RC-1	Establish and Maintain Regional Operations Working Group	COMPASS	Ongoing (2013+)	$50/ year	Establish and facilitate a regional, interagency working group to discuss on regional operations issues on a regular basis (e.g. quarterly). Topics of the group may include: project updates and coordination; development of interagency agreements; project funding and grant opportunities; coordination with regional transportation planning processes and policy makers; maintenance of the regional ITS infrastructure inventory; and special projects of regional operations significance.
RC-2	Create Interagency Agreements for ITS Management and Operations	COMPASS	2014	$50	Develop a master, interagency agreement for ongoing management and operations of ITS equipment. This may include implementation, maintenance, operational protocols, and funding agreements. The master agreement may be supplemented by specific sub-agreements for management of specific devices/systems or in support of Regional Concepts for Transportation Operations (RCTOs).
RC-3	Performance Measurement Regional Concept for Transportation Operations (RCTO-PM) and Data Infrastructure Strategy	COMPASS	2014	$25	Building off of this regional plan, develop a detailed strategy for implementation of operations performance measurement and collection/archiving of regional operations data to ensure consistency in quality and coverage across the region. This study will identify the operations data needed to support the regional performance measurement program. The data collection strategy will identify the detection infrastructure, desired coverage, and deployment standards (e.g. and detector spacing) necessary to support the performance measurement program.
RC-4	Transportation System Management and Operations Performance Assessment	COMPASS	2015	$25	Conduct a regional study to quantify the benefits of regional operations programs, including ITS, based on regional performance measures and data developed under other tasks. This project may occur as a one-time project or as a recurring (e.g. annual or bi-annual) effort. The outcomes of this effort can be used to inform operating agencies, policy makers, and the public on the benefits of transportation system management and operations in the Treasure Valley.
RC-5	Update/Develop Standard Specifications for ITS and Communications Infrastructure	ITD D3/ACHD	2015	$60	This project will develop regional guidelines for ITS equipment deployed in the region to promote consistency and interoperability of ITS infrastructure across the region. These guidelines will supplement existing agency design standards. Examples may include: Traffic signal design and detection standards; provisioning for fiber optic infrastructure; and CCTV functional specifications. Guidelines can be assembled in "workbook" fashion and updated independently as needed.

How do we achieve the Vision?

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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

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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

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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)

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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

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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

Treasure Valley Transportation System: Operations, Management, and ITS

The plan is available at www.compassidaho.org

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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.

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Questions?

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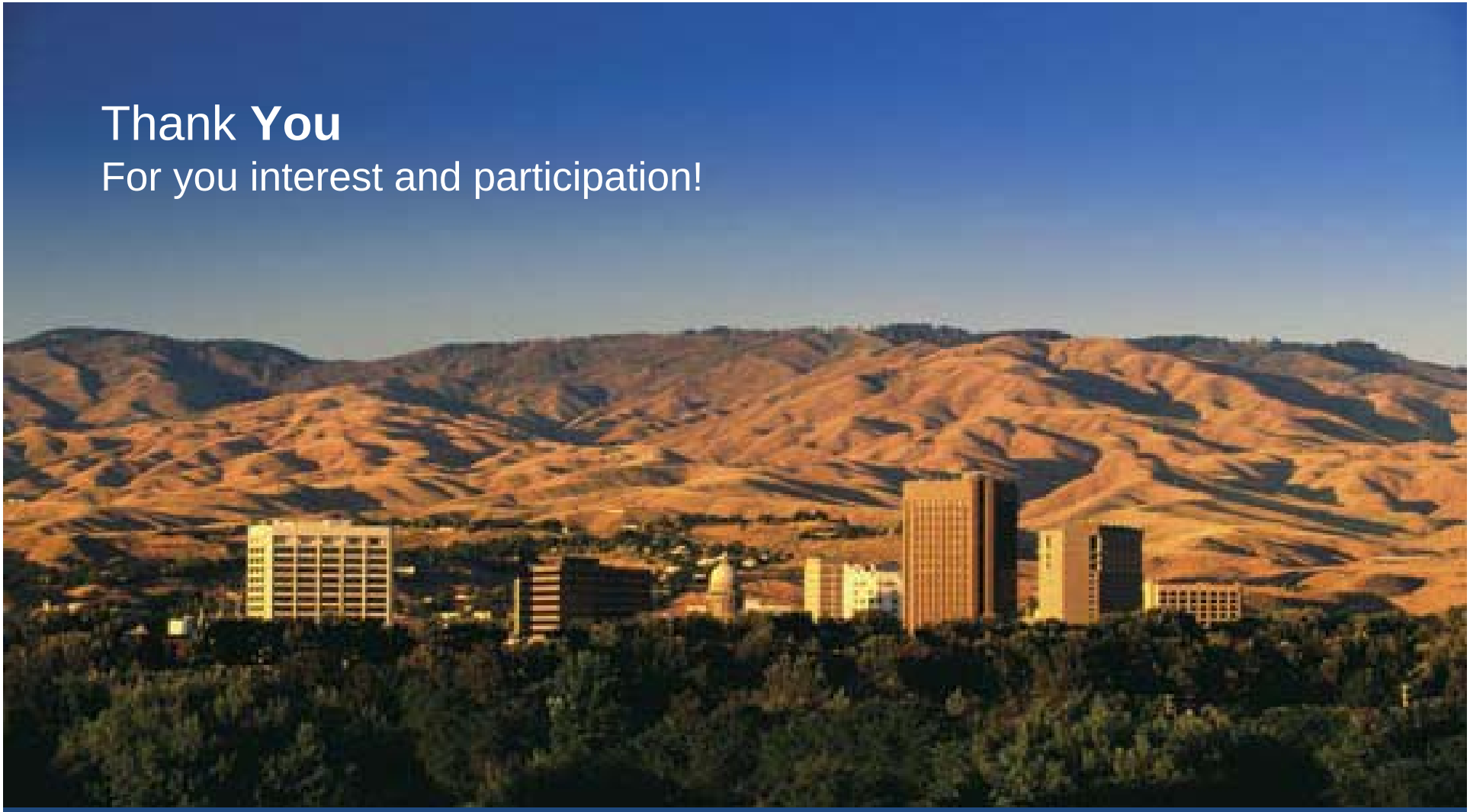
Thank **You**

For you interest and participation!



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