COMPASS
COMMUNITY PLANNING ASSOCIATION
of Southwest Idaho

Treasure Valley Transportation Systems Management and Operations (TSMO) Strategic Plan 2020 - 2030 Update

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Submitted to the Community Planning Association of Southwest Idaho (COMPASS)
by IBI Group
With DKS Associates and McFarland Management
January 16, 2020

FINAL REPORT

Treasure Valley Transportation Systems Management and Operations (TSMO) Strategic Plan

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Acronym	Definition
ACHD	Ada County Highway District
ARC-IT	Architecture Reference for Cooperative & Intelligent Transportation
ATMS	Advanced Traffic Management System
AV	Automated Vehicle
CAV	Connected and Automated Vehicle
CCTV	Closed Circuit Television
CIM	Communities in Motion
CMM	Capability Maturity Model
CNG	Compressed Natural Gas
COMPASS	Community Planning Association of Southwest Idaho
CV	Connected Vehicle
DMS	Dynamic Message Signs
DOT	Department of Transportation
EMS	Emergency Medical Services
EOC	Emergency Operations Center
FAST Act	Fixing America's Surface Transportation Act
FHWA	Federal Highway Administration
FTA	Federal Transit Authority
GIS	Geographical Information System
HAR	Highway Advisory Radio
ITD	Idaho Transportation Department
ITS	Intelligent Transportation Systems
MaaS	Mobility as a Service
MAP-21	Moving Ahead for Progress in the 21st Century
MOD	Mobility on Demand
MPO	Metropolitan Planning Organization
NHD	Nampa Highway District #1
O&M	Operations and Maintenance
RAD-IT	Regional Architecture Development for Intelligent Transportation
ROWG	Regional Operations Workgroup
RWIS	Road Weather Information System
TMC	Traffic Management Center
TNC	Transportation Network Companies
TSMO	Transportation Systems Management and Operations
TSP	Transit Signal Priority
USDOT	U.S. Department of Transportation
V2I	Vehicle-to-Infrastructure
V2V	Vehicle-to-Vehicle
VRT	Valley Regional Transit

1 The Case for TSMO in the Treasure Valley

1.1 Introduction

The Treasure Valley Transportation Systems Management and Operations (TSMO) Strategic Plan presents a cooperative approach to manage and operate the region's multi-modal transportation system to improve safety, efficiency, and reliability.

The plan covers Ada and Canyon Counties, which together form Idaho's Treasure Valley. It covers a planning horizon of ten years from 2020 through 2030, with an emphasis on solutions that can be implemented in the near term, and at relatively low cost compared with conventional capital investments.

Valley Regional Transit is a TSMO plan stakeholder that has vastly advanced its technology program over the past five years.

Because many TSMO strategies are enabled by rapidly-evolving technologies, including Intelligent Transportation Systems (ITS) and advances in mobile technology, effective TSMO implementation requires ongoing coordination and a willingness to embrace emerging operational strategies.

Implementing TSMO will benefit the region by providing new and effective tools to address the transportation needs of the Treasure Valley while increasing mobility options for travelers.

The Community Planning Association of Southwest Idaho (COMPASS) sponsored the development of the TSMO Strategic Plan. COMPASS is the federally designated Metropolitan Planning Organization (MPO) for Ada and Canyon Counties. The plan was developed by a Regional Operations Workgroup (ROWG) representing numerous state, regional, county, and local transportation and emergency services agencies.

COMPASS anticipates maintaining the TSMO Strategic Plan as a living document going forward, with interim updates completed in consultation with participating agencies in the Regional Operations Workgroup. Updates to the plan may occur every five years.

What is Transportation System Management and Operations (TSMO)?

As defined by the Federal Highway Administration (FHWA)[1], TSMO is a set of strategies that focus on operational improvements to maintain, manage and even restore the performance of the existing transportation system before extra capacity is needed.

TSMO is an iterative process, where management and operations stakeholders and planners work together to define a common vision for transportation system operations in the region, develop operations objectives to guide the selection of management and operations strategies, and identify performance measures that will enable them to track progress toward their objectives (Figure 1).

The goal of TSMO is to maximize the performance of current transportation facilities and the transportation system. This requires knowledge, skills, and techniques to administer comprehensive solutions that can be quickly implemented at a relatively low cost, enabling transportation agencies to "stretch" their funding to benefit more areas and customers. TSMO helps agencies balance supply and demand and provide flexible solutions to match changing conditions, demographics, and technology, as well as external pressures. Successful TSMO plans have three key elements:

- **Strategic elements** are the foundation for developing a TSMO program. These elements define the relationship of TSMO to the agency mission or regional vision. The strategic aspect of TSMO program planning provides answers to questions of "why" TSMO is important, and a high-level vision of "what" the agency seeks to achieve, along with strategic goals and objectives. This Introduction, as well as Section 3, Regional TSMO Toolkit, discuss these strategic elements.
- **Programmatic elements** address issues surrounding organizational structure and business processes for implementing TSMO activities. This level of planning addresses "how" the program operates, resource and workforce needs, and internal and external coordination and collaboration. It identifies responsibilities of organizational units for specific TSMO services, projects, and activities, as well as use of analysis tools to guide investment decision-making. Section 2, Current Conditions and Regional Needs Assessment, provides these programmatic elements.
- **Tactical elements** step down from the broad institutional and organizational issues to address specific services, programs, and priorities. The Regional ITS Architecture and Regional ITS Implementation Plan provide these tactical elements.

Early involvement and buy-in of stakeholders and key decision-makers enables the development of effective TSMO strategies, as explained in the graphic below. Successful TSMO plans tend to involve multiple workshops to establish an understanding of the current and future operational contexts, regional trends, and where the greatest congestion bottlenecks occur. During these workshops, stakeholder roles and responsibilities are defined and approaches to traffic management strategies and performance measures are developed. TSMO strategies are finalized in follow-up workshops, and once accepted by the group, are implemented by stakeholders.

[1] Source: *Developing and Sustaining a Transportation Systems Management & Operations Mission for Your Organization A PRIMER FOR PROGRAM PLANNING*; prepared by USDOT Federal Highway Administration; September 2017. https://ops.fhwa.dot.gov/publications/fhwahop17017/fhwahop17017.pdf accessed September 24, 2019

Figure 1: FHWA TSMO Process

Examples of TSMO in the Treasure Valley

TSMO strategies are employed across the region today, by multiple agencies, to improve the effectiveness of the multi-modal regional transportation system.

Examples include:

- **Incident and Emergency Management**: The Idaho Transportation Department (ITD), Ada County Highway District (ACHD), State Communications (StateComm), and emergency management personnel use technologies to identify and respond to traffic incidents, special events, and severe weather across the region.
- **Traffic Signal Coordination:** Many traffic signal systems in the region are integrated into advanced computerized systems that optimize signal timing based on prevailing traffic conditions and/or incident/event scenarios.
- **Traveler Information:** ITD provides multimodal real-time traveler information through its 511 traveler information telephone system, smartphone app, and website (511.idaho.gov). ACHD provides traffic camera feeds and other information through its website. Regional agencies partner with private providers to improve situational awareness of agencies and travelers about real-time conditions.
- **Transit Management:** Valley Regional Transit (VRT) has invested in technologies that support real-time tracking and dispatch of transit vehicles real-time bus arrival information for its customers, and other advanced applications.

While enabled by advanced transportation technologies, these TSMO strategies also rely on personnel, coordinated plans, supportive policies, and collaboration among agencies to proactively operate the transportation system.

Geographic Coverage

The TSMO Strategic Plan, as well as the updated Regional ITS Architecture, cover Ada and Canyon Counties which form Idaho's Treasure Valley and are shown in Figure 2.

Idaho's Treasure Valley extends from the Oregon border on the west through Ada and Canyon Counties to the east, following Interstate 84 (I-84) corridor.

The Treasure Valley includes the cities of Boise, Eagle, Garden City, Kuna, Meridian, and Star in Ada County; plus, Caldwell, Nampa, Middleton, Notus, Wilder, Greenleaf, Melba, and Parma in Canyon County.

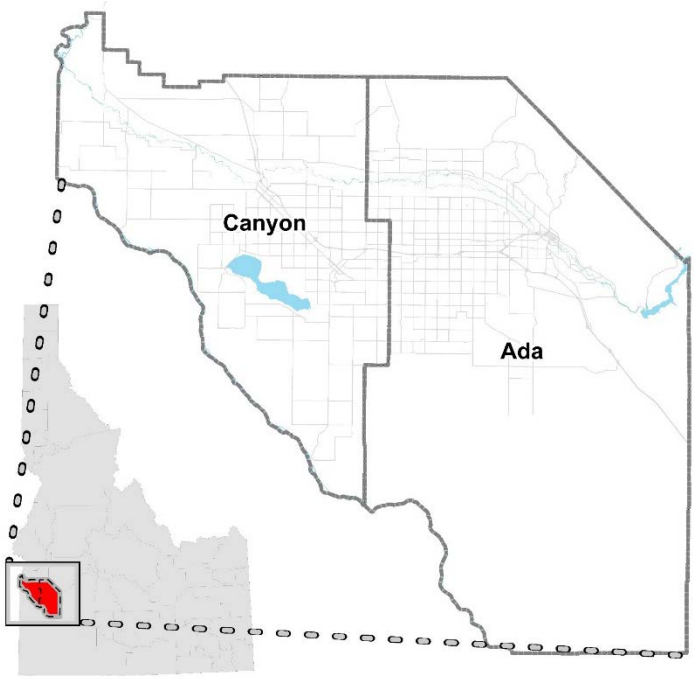

Figure 2: Map of Canyon and Ada Counties

The two counties include both rural and urbanized areas. TSMO strategies are most commonly applied in urban areas where traffic congestion, high incident frequency, and other complex operating conditions merit a proactive approach to transportation system management. However, there are rural applications of TSMO that focus on traveler information, incident management, winter maintenance, and construction/maintenance management.

1.2 Why TSMO in the Treasure Valley?

A Vision for Active Traffic Management

Regional agencies developed a TSMO Vision for the Treasure Valley in 2014 as part of the development of the region's first TSMO plan.

Following review by participating agencies, this vision remains unchanged for the 2020 plan update.

The vision reflects the value of TSMO to the region and the commitment to cooperative approaches to operations and management of the multi-modal transportation system.

Treasure Valley TSMO Vision:
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

TSMO Is Important to the Region's Mobility Future

The Treasure Valley routinely ranks as one of the fastest-growing metropolitan areas in the United States. Along with rapid population growth comes substantial pressure on the regional transportation system across an expanding urbanized area.

While Ada County has long been the region's urban core, increasing growth in Canyon County communities such as Nampa and Caldwell is expanding transportation demand and congestion further to the west along the I-84 corridor.

The ability to expand transportation system capacity to accommodate the increased demand is constrained by financial, environmental, and right-of-way constraints. The pace of infrastructure expansion alone cannot keep pace with the expectations of travelers. This requires new and innovative thinking about how the region can accommodate growth by making the most of the transportation infrastructure that exists today, and by strategically investing available transportation dollars in solutions that make a difference.

Below are a number of reasons why TSMO is a key part of the Treasure Valley's transportation strategy:

- Operational issues (such as non-recurring congestion, incidents, and weather events) are a growing source of regional traffic congestion.
- Agencies are seeking affordable solutions to meet growing transportation demand.
- The public increasingly expects technology-enabled travel options and up-to-date information.
- TSMO complements other low-cost transportation strategies and can be implemented in the near term.
- Many TSMO strategies have been proven effective in other regions facing similar challenges.
- Past TSMO investments and partnerships provide a foundation for future success.

The impact of "non-recurring" congestion, due to accidents, special events, and winter weather, for example, have an outsized impact on travel conditions and the perceptions of travelers about the quality of the transportation system.

There is an opportunity to gain efficiency from the region's existing transportation infrastructure. Moreover, travelers can benefit from more up-to-date information on real-time travel conditions and mobility alternatives, such as transit, car share, and bike share.

TSMO can contribute to the improvement of each element of the Treasure Valley's multi-modal transportation system (Table 1). TSMO provides strategies and tools that allow operating agencies to proactively manage the transportation network, and for the traveling public to make more informed choices. As the region continues to grow, TSMO will remain an important part of the region's overall strategy to maintain, maximize, expand, and diversify the region's transportation network.

Table 1: TSMO Contributes to All Modes

	**Active Transportation** (cyclists and pedestrians) is a growing component of the Treasure Valley's transportation system. Addressing bike and pedestrian safety and infrastructure needs is key. *TSMO supports active transportation through applications such as pedestrian-actuated crossing beacons, crosswalk countdown timers, bicycle detection at traffic signals, and trip planning for shared modes.*
	**Freight** is vital to the Treasure Valley economy. Using data collected from previous studies, multiple critical urban freight corridors have been designated, and COMPASS has integrated freight into its planning to address safety and congestion. *TSMO supports freight by increasing the reliability of the region's arterials and freeways through active traffic management, enhanced signal traffic signal operations, and ramp metering.*
	**Public transportation** in the Treasure Valley is operated by VRT and Treasure Valley Transit (TVT), providing fixed route and paratransit bus service in both urban and rural communities in the region. Transit reliability and customer information needs are key components to this TSMO plan. *TSMO supports public transportation through speed and reliability enhancements for transit, improved multi-modal trip planning, real-time information, convenient fare payment, and many other applications.*
	**Roadways** are the backbone of the transportation system in the region and include surface streets, arterials, and state and interstate highways. *TSMO supports road users through improved incident management, better winter road maintenance, reduced signal delay, better routing information, and many other services.*

COMPASS, as the MPO for Ada and Canyon Counties, helps shape transportation planning and strategic planning initiatives, such as the region's long-range transportation plan, *Communities in Motion 2040 2.0* (CIM 2040 2.0), facilitating regional cooperation, and managing how and where federal transportation funds are invested in transportation projects in Ada and Canyon Counties. COMPASS helps ensure that transportation projects continue to meet the region's growing needs and provide the greatest benefit to the region.

TSMO supports COMPASS' complete streets/network concepts by taking a holistic approach to the Treasure Valley's transportation system. The intent of complete streets/network concepts are to promote a balanced approach to roadways and associated infrastructure for motorists, bicyclists, transit, and pedestrians of all ages and abilities, with emphasis on increasing the safety, efficiency, and economic vitality of the region.

1.3 History of TSMO in Treasure Valley

Agencies in the Treasure Valley have been actively planning and deploying advanced transportation technologies for over 20 years. The scope and intensity of TSMO efforts has grown over the years, from a few ITS demonstration projects to full-scale regional deployments with substantial commitments of resources from multiple agencies.

Since the region's first TSMO plan was completed in 2014, over $14 million has been invested in 44 completed projects in the Treasure Valley.

In 1999, the region completed its first *ITS Strategic Plan and Architecture Plan*. The plan included an ITS deployment roadmap and project list, a communication plan, and ITS architecture documents. Since that time, multiple local agencies, including ACHD and ITD, have commissioned further studies and plans for incident and emergency management, deployment statistics and inventories of capital improvements, and communications infrastructure and ITS.

By 2006, growth in the Treasure Valley required a more pragmatic approach to ITS and congestion management to meet the region's needs. The 2006 *Treasure Valley Intelligent Transportation Systems Strategic Plan* focused on coordinated approaches to ITS technologies and included additional transportation and traffic management and operations considerations.

The region's first TSMO plan, known as *Treasure Valley Transportation System: Operations, Management, and ITS*, was completed in 2014. This plan incorporated broader aspects of TSMO beyond ITS technology, such as improving interagency collaboration and linking TSMO to regional planning. For the first time, the plan covered both Ada and Canyon Counties, to reflect the growth in transportation demand and operations potential in Canyon County.

The 2014 plan established a Regional TSMO Toolkit reflecting a wide range of technology and inter-agency coordination strategies including incident management, arterial and freeway management, traveler information, public transportation management, road weather, regional data archiving, and maintenance/construction management.

Significant Recent Accomplishments

The 2014 TSMO plan contained a project implementation plan reflecting each of the TSMO strategies and involving multiple agencies. Substantial progress in project implementation was achieved between the release of the 2014 plan and the present.

Key TSMO implementation accomplishments since the completion of the 2014 TSMO plan are summarized in Table 2 below.

Table 2: Key TSMO Accomplishments

Category	TSMO Accomplishments since 2014
Communications Systems Upgrades	• Regional agencies installed and upgraded fiber optic communications along key corridors, arterials, and highways to support traffic management & monitoring, ITS deployments and networked communications devices. • Building on collaboration through the ROWG, ACHD, City of Boise, and Boise State University constructed a shared fiber optic project in downtown Boise. The project resulted in an estimated capital cost savings of $600,000, plus additional savings in operations and maintenance (O&M) costs.

Category	TSMO Accomplishments since 2014
Traffic Signal Upgrades	• ACHD initiated the SMART Arterial Management program to replace traffic signal controllers and detection devices at 82 intersections and implement new traffic signal performance measures. • Multiple agencies performed signal timing updates in key corridors to reduce travel times and increase system reliability. • ACHD and VRT collaborated to install upgraded traffic signal equipment to support transit signal priority (TSP) on the State Street corridor in Boise. • Emergency vehicle pre-emption technology was deployed and maintained by agencies across the region. • The City of Nampa made initial strides towards interconnecting traffic signals and establishing a new central traffic management system.
Traveler Information	• ITD installed additional dynamic message signs (DMS) along freeways and other key decision points along highly-traveled routes to provide incident and travel time alerts. • ITD completed significant enhancements to the Idaho 511 statewide traveler information system, including text notifications.
Emergency and Incident Response	• Emergency response vehicles and ITD fleet vehicles were equipped to enable emergency vehicle pre-emption at signalized intersections. • Ada County opened a new 911 Emergency Dispatch Center which works closely with traffic agencies on incident response.
Public Transportation Management	• VRT procured and installed new public transportation technologies to improve efficiency and provide ridership data, including computer-aided dispatch, real-time passenger information, automatic passenger counters, new fare boxes, and onboard stop annunciation. • VRT partnered with ACHD to implement TSP on State Street. • VRT implemented and operated a new bike share service.
Freeway and Arterial Management	• ITD implemented a new statewide traffic management system in partnership with StateComm. • The ACHD Traffic Management Center was upgraded to include new closed circuit television (CCTV) camera feeds, additional ITS field devices, and a new video wall. • An online, multi-agency detour plan for I-84 and I-184 was developed to improve management of traffic impacts from freeway incidents.
Data Management	• COMPASS led the development of a Regional Data Center that hosts ITS and communications inventory data. • COMPASS GIS capabilities supported the development and hosting of the online I-84/I-184 Detour Plan.
Regional Collaboration	• Following the completion of the 2014 plan, the ROWG met to discuss implementation of planned projects and other coordination issues, as well as opportunities, benefits, and challenges of fiber optic network sharing among agencies.
Regional Planning	• TSMO was incorporated into CIM 2040 2.0. • COMPASS hosted educational activities to promote awareness of TSMO needs and opportunities.

Category	TSMO Accomplishments since 2014
Other Initiatives	• The State of Idaho initiated an Autonomous and Connected Vehicle Testing and Deployment Committee, with Treasure Valley representation, to coordinate statewide efforts.

Regional Operations Workgroup Leadership

In 2011, COMPASS first convened the ROWG, comprised of regional transportation and emergency management agencies. The ROWG served as the project steering committee for the development of the Treasure Valley TSMO Strategic Plan (see sidebar).

The ROWG provides a forum for agencies interested in cooperative regional approaches to operating and managing the multi-modal transportation network. The ROWG focuses on multimodal transportation system efficiency, reliability, safety, and ease of use as it relates to the regional planning process, including planning for operations through a coordinated approach to multimodal system operations, ITS data management, and maintenance of related planning documents.

The ROWG formed to support the development of the region's initial TSMO plan and has met periodically to discuss regional TSMO issues and to complete other initiatives, such as the update of the I-84/I-184 Detour Plan. The ROWG is similar to multi-agency operating groups active in other metropolitan areas around the county, which are often also sponsored by MPOs.

Regional Operations Workgroup: TSMO Plan Participating Agencies

- ACHD
- Ada County Sherriff
- City of Boise
- Canyon County Sheriff
- City of Caldwell
- City of Meridian (Planning and Police Department)
- City of Nampa (Traffic Services and Police Department)
- COMPASS
- ITD District 3
- ITD – Headquarters (Operations and Emergency Management)
- Idaho State Police (ISP)
- Nampa Highway District No. 1
- StateComm
- TVT
- VRT
- FHWA – Idaho

In addition to guiding the development of the plan, the ROWG plays a critical role in its implementation. Many of the regional strategies identified in the TSMO plan require cooperative efforts to deploy ITS infrastructure, develop operating policies, secure capital and operating funds, and advocate for TSMO as a regional transportation strategy. The ongoing efforts of the ROWG in the future are also necessary to complete periodic updates to the plan, to ensure its relevance to the needs of the region.

1.4 TSMO Strategic Plan Development Process

COMPASS facilitated the development of the TSMO Strategic Plan in partnership with stakeholder agencies comprising the ROWG. The project initiated in fall 2019, with four meetings of the ROWG in January, May, September, and December 2019.

At the initial ROWG Meeting #1 in January, information on updated needs was solicited from the from stakeholder agencies. Participants also reflected on accomplishments since the 2014 plan was developed, as well as on current opportunities and challenges.

At ROWG Meeting #2, agencies reviewed a draft updated regional ITS and communications inventory prepared by COMPASS. Numerous other topics relevant to the TSMO plan development were also discussed, including toolkit operational strategies and impacts of emerging technologies.

Following ROWG Meeting #2, in-depth interviews were held with leadership at stakeholder agencies, along with various follow-up emails, surveys, and phone calls to collect both needs

and ITS inventory updates. This information was then fed into the updates to the TSMO project list and Regional ITS Architecture (Figure 3).

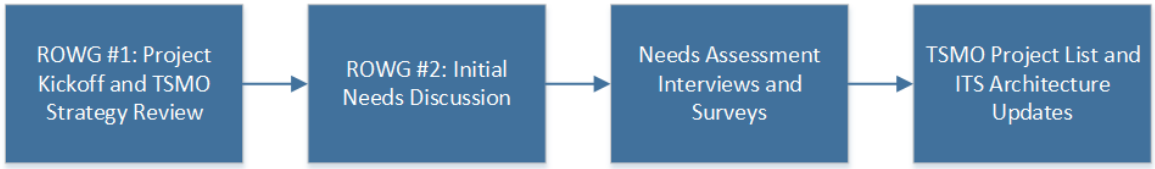

Figure 3: Information Gathering Process

A summary of the findings and updates was then presented at ROWG Meeting #3. Each item was presented to the group for feedback and concurrence. Finally, in ROWG Meeting #4, the workgroup reviewed the draft TSMO plan for agency input prior to finalization and also discussed implementing next steps following completion of the plan.

In total, over a dozen interviews and numerous follow-up conversations were held with the region's TSMO and ITS stakeholders. During these interviews, completed, current, and future projects were identified; feedback on the previous TSMO plan was obtained; and operational and technological needs were captured.

1.5 Plan Components

With this update, a deliberate shift in direction was undertaken to make the plan a living document that would be simpler to share and maintain in the face of rapidly-evolving transportation technologies. Several components of the plan have migrated from report format to electronic resources that can be more easily revised over time to keep them current and relevant to plan users, including:

- **ITS Inventory:** maintained by COMPASS in an ArcGIS database, as opposed to static maps in the report.
- **TSMO Implementation Plan (Project List):** available in tabular format from COMPASS, listing current TSMO projects by agency. The TSMO implementation plan is intended to be updated and revised each year to reflect deployment progress, commitment of funding, and changing agency needs/priorities
- **ITS Architecture:** available through COMPASS and accessible as an electronic database file using the U.S. Department of Transportation's (USDOT's) free Regional Architecture Development for Intelligent Transportation (RAD-IT) software. The electronic ITS architecture allows for more convenient access by project design teams and ease of incorporating future updates.

This document comprises the report components of the plan. The remaining sections of the TSMO Strategic Plan report are organized as follows:

- **Existing Conditions and Needs Assessment:** This section provides context into the current ITS and TSMO implementation environment in the Treasure Valley, as well as describes the roles, challenges, and priorities of the various operating agencies. These current conditions and needs provide the baseline and framework into which new projects and initiatives must align.
- **Emerging Technology Impacts and Considerations:** This section provides an overview of changes in freight delivery, Mobility as a Service (MaaS), and Connected and Automated Vehicles (CAV), and how the Treasure Valley is preparing for them.

- **Building a TSMO Toolkit:** This section describes the TSMO strategies that are applicable to the region and that will support the region in moving forward with addressing the needs in Section 2 (Current Conditions and Future Needs).
- **Putting the Pieces Together – The Regional ITS Architecture:** This section provides an overview of the Regional ITS Architecture, which is a federally-mandated database of ITS inventory, services, and information exchanges.
- **Communications Priorities:** This section describes how the region has invested in its communications infrastructure and will continue to do so, to provide the connections needed for future TSMO and ITS implementation.
- **Measuring and Managing Performance:** This section provides the performance metrics that COMPASS uses to provide regular monitoring and reporting. These metrics help to provide feedback on how the region is addressing its transportation needs and extensive growth, and where additional ITS and capital improvements may be necessary. The deployment of ITS devices provides greater opportunity to collect and assess data that measures the performance of the transportation network.
- **Implementing TSMO and Achieving the Vision:** This section focuses on steps to implement the TSMO strategies and achieve the vision over the next five to ten years through project implementation and regional collaboration.

2 TSMO in the Treasure Valley: Current Conditions and Future Needs

This section provides information on existing transportation and infrastructure conditions in the Treasure Valley, as well as an overview of agencies and stakeholders that are part of the region's transportation system and were included in the development of this TSMO Strategic Plan.

This information was collected through the process described in Section 1 (The Case for TSMO) and is presented both regionally, in describing the current conditions, equipment, and needs of the region, as well as through individual stakeholder profiles. The stakeholder profiles describe each stakeholder's functions, infrastructure, key needs, and what they will be focusing on from an operational and infrastructure perspective over the next ten years.

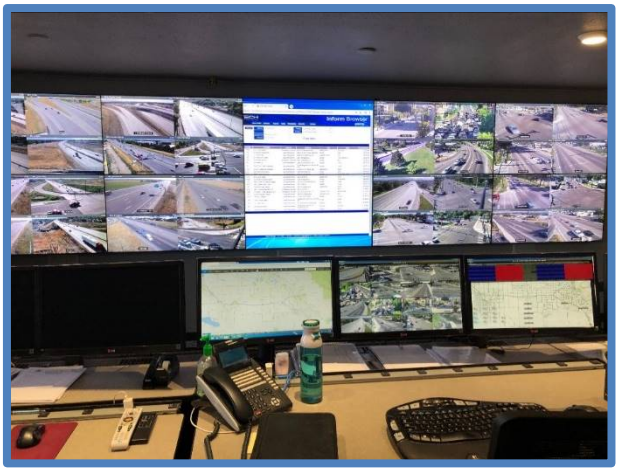

Figure 4: ACHD Traffic Management Center

2.1 Regional Operations Roles

Agencies in the region provide a wide range of transportation system management and operations services in the Treasure Valley through multiple partnerships and through the sharing of information, resources, and infrastructure. The region's growing population is served by a multi-agency street and highway network, fiber optic and wireless data communications system, regional transit system, and multiple law enforcement and emergency response agencies at the federal, state, county, and local levels. Key TSMO roles include:

- **StateComm** provides statewide traffic management center functions on state highways, under contract to ITD.
- **ACHD** manages, operates, and maintains the transportation infrastructure for all the cities within Ada County, as well as select ITD traffic signals (Figure 4).
- In Canyon County, the **City of Caldwell and the City of Nampa** manage, operate, and maintain their respective road networks, including certain ITD traffic signals.
- **ITD, StateComm, ACHD, and the Idaho State Police** coordinate incident response, but many other transportation and emergency management agencies, including Ada/Canyon County emergency dispatch and police and fire agencies, are also involved.
- VRT, the primary public transit agency, recently completed development of a five-year technology plan. **TVT** also provides rural transit services in the area.

Based on official demographic forecasts developed by COMPASS, the Treasure Valley is projected to surpass one million inhabitants by 2040. Therefore, the region is expected to face increases in congestion — investments in additional ITS infrastructure and regional TSMO strategies can help alleviate the additional pressure on the transportation system.

2.2 Regional Intelligent Transportation System Assets

Regional agencies have invested heavily in the development of the region's communications and ITS capabilities. Existing roadway ITS assets are summarized in Table 3. Transit ITS infrastructure is detailed in the Treasure Valley Transit agency profile later in this section.

A current, detailed regional ITS inventory is available and maintained online by COMPASS.

Table 3: ITS Assets

	ITS technologies generally use networked communication completed via cellular connections or fiber optic cable to connect to the Traffic Management Center (TMC) or owner/operator of the ITS equipment. In the Treasure Valley, over **545 miles of fiber** have been installed, providing connectivity and control capabilities to traffic signals, CCTV cameras, DMS signs, and other sensing equipment.
	Advanced Traffic Management System (ATMS) software is used by TMCs to manage and control field devices and supporting systems. Both ACHD and ITD have their own ATMS software systems; however, the systems are from different vendors and are not integrated. The City of Nampa has reached a point in its growth where it is considering the need for ATMS capabilities within its own jurisdiction.
	Approximately **544** intersections are signalized in the Treasure Valley. The majority of these traffic signals are equipped to provide emergency vehicle pre-emption and some are equipped to provide TSP, with the **first installation of TSP** completed on State Street in Boise.
	Of the **544** intersections where **traffic signals** exist throughout the Treasure Valley, the majority can be managed by a central control system, which allows adjustment of signal timing for traffic demand management purposes and can also provide maintenance alerts if equipment is malfunctioning.
	Approximately **197** intersections include **CCTV cameras** that are operated by multiple agencies in the Treasure Valley. The CCTV cameras are generally installed at high-traffic intersections in the urban core and along highways and arterials. The cameras are used to detect and manage traffic and incidents in the transportation network by providing a live view to traffic managers.
	**Seventeen DMSs** have been deployed along major highways in the Treasure Valley. DMSs primarily serve traveler information functions, providing messages about en-route traffic conditions and incidents impacting travel. DMSs are controlled by ITD, ACHD, and StateComm.
	ITD operates **eight highway advisory radio** (HAR) beacons in the Treasure Valley, which broadcast travel condition information over a three- to five-mile radius. HAR sites are often supplemented with static or dynamic message signs that alert drivers to tune into a radio station when important traveler information is being broadcast. However, ITD is now planning to decommission the HAR as drivers are using other mobile-based methods of receiving traveler information.

Traffic monitoring equipment is installed in many locations throughout the region and includes traffic loop detectors, radar, video, and Bluetooth readers to collect traffic volume, speed, and occupancy data.

Sixteen road/weather information stations (RWIS) have been deployed in the Treasure Valley. RWIS collect pavement and atmospheric data and are used by O&M personnel to support winter weather operations and provides alerts about road conditions via the traveler information systems such as 511 and DMS.

ITD, ACHD, Canyon County, City of Caldwell, and City of Nampa all operate **vehicle fleets for road weather and maintenance activities**. During the winter, keeping roadways clear of snow is important from both mobility and public safety standpoints. Both counties in the region use automatic vehicle location on their vehicles to support efficient winter weather operations.

2.3 Regional Needs

In the individual stakeholder interviews, as well as ROWG meetings, a commonly-heard theme across the region was that population and economic growth have continuously increased pressure on the road network, while funding remains limited to address congestion and expand the multimodal network in the region. Broadly speaking, stakeholders indicated that the region in the future will need to:

- Increase intra-jurisdictional coordination for **incident management.**
- Expand traffic and emergency management **center-to-center information sharing** and coordination between state and local jurisdictions.
- Increase **safety of pedestrians and cyclists** by prioritizing improvements for non-motorized travelers.
- Identify and deploy solutions that are **low-cost** and can be deployed in the **near term.**
- Preserve operational capabilities by **maintaining investments** made in TSMO.
- Address the increased user demand on the road network by providing **reliable public transportation.**
- Adapt to and leverage **new transportation technologies** and changing consumer expectations for urban travel, such as MaaS, transportation network companies, and first mile/last mile applications.
- Have **a flexible approach** to new transformative technologies such as automated and connected vehicles.

2.4 Stakeholder Profiles

The following tables summarize each regional agency that is active in regional TSMO programs and/or ITS deployment. Each table includes an operational profile, functions, key needs, and agency focus for moving forward with internal and collaborative TSMO programs. An ITS inventory maintained by each stakeholder and complied by COMPASS is provided in Appendix C.

Ada County Highway District

ACHD has operated its own TMC since 2000. The center includes day-to-day O&M, incident management, and traveler information dissemination for the roadway network within Ada County.

Operational Priorities	• ACHD has achieved most of its objectives in building out its communications and ITS infrastructure and is now focusing on maintenance for the future. • ACHD strongly supports its TMC. The TMC enables good coordination with other agencies, especially emergency responders. • Future ITS projects will focus on proven technology and signal performance measurement.
Functions	• Freeway and Arterial Traffic Management • Incident and Emergency Management • Road Weather and O&M • Traveler Information
Key Needs	• Continuous management of arterials for efficiency and safety. • Providing ongoing support to emergency responders to address incidents in the county.
Forward Focus	• Signal performance measurement and data collection. • Improving freight management and operations strategies, including truck traffic signal priority and freight data collection.

City of Boise

The City of Boise does not directly operate any ITS infrastructure, as it is managed by ACHD along with other transportation functions. From a planning and policy perspective, the City of Boise is working to improve overall multimodal movement of people into, out of, and through the city.

Operational Priorities	• The City of Boise supports public transportation, pedestrian, and bicycle services and facilities.
Functions	• Improved bicycle and pedestrian crossings on arterials so they do not become barriers. • Reliable public transportation service.
Key Needs	• Continuing to support and expand VRT services, including the expansion of TSP to other routes (beyond State Street) in Boise City. • Promoting and deploying technologies to enhance pedestrian and bicycle operations, comfort, and safety. • Working with ACHD and ITD to improve vehicle movement in the city.
Forward Focus	• Working closely with other agencies to promote safe and efficient vehicle, transit, bicycle, and pedestrian movement in and through the city.

City of Caldwell

The City of Caldwell's Traffic Operations Team provides traffic management and control support during incidents or other events. The City of Caldwell maintains street and traffic sign infrastructure, signals, and winter weather operations.

Operational Priorities	• The City of Caldwell continues to improve their ability to manage local traffic with better systems, and coordination with other agencies.
Functions	• Arterial Traffic Management • Incident and Emergency Management • Road Weather and O&M • Traveler Information
Key Needs	• Stronger coordination with City of Nampa and ITD District 3. • Improving signal systems, timing coordination, and management of traffic flows throughout area.
Forward Focus	• Continue to pursue funding and implement defined traffic management projects.

ITD District 3

ITD District 3 manages the operations and maintenance of state routes for a ten-county area in southwest Idaho. ITD also partners with StateComm for around-the-clock response to incidents and other traffic events. Key focus areas in the Treasure Valley include management of freeways and state highways, incident management, winter operations, and traveler information dissemination.

Operational Priorities	• ITD D3 is focused on the basics of roadway maintenance and construction, incident management, and signal operation. • Generally satisfied with the coverage of interstate ITS infrastructure such as RWIS and signage. • Interested in expanding active freeway management operations. Better understanding will come from the planned I-84 Corridor Operations Plan.
Functions	• Freeway and Arterial Traffic Management • Incident and Emergency Management • Road Weather and O&M • Traveler Information
Key Needs	• Increased data sharing and inter-departmental coordination with ACHD, City of Nampa, and City of Caldwell. • Clarification of roles and responsibilities for dynamic message signs. • Funding for additional incident response vehicles.
Forward Focus	• Complete I-84 Corridor Operations Plan and implement near-term recommendations.

ITD Headquarters

ITD Headquarters has overall statewide responsibility for ITS programs, including operation of the statewide 511 system. Most ITD traffic management and maintenance functions are performed at the district level with certain ATMS and dispatch functions performed by StateComm and ITS operations and maintenance provided by Headquarters.

Operational Priorities	• ITD Headquarters is focused on continuing to maintain existing statewide systems.
Functions	• Interstate and Highway Traffic Management • Incident and Emergency Management • Traveler Information
Key Needs	• ITD Headquarters will continue to focus on maintenance of its key systems, including asset management for ITS and looking for additional information sharing and coordination opportunities with other agencies.
Forward Focus	• Improving engagement and coordination with other agencies, including ITD District 3, for traffic management, operations, and incident management.

City of Nampa

Multiple divisions within the Public Works Department work together to ensure the efficient movement of traffic in the City of Nampa, located in eastern Canyon County. The Street Division manages Nampa's roadway network, this including maintenance of pavement, markings, and signals, and ensuring operations during winter weather conditions. The Nampa Police Department also plays an important role in responding to traffic incidents and supporting safe travel in the region.

Operational Priorities	• The City of Nampa is focusing on significantly improving their ability to manage traffic through active monitoring at a new TMC with central control of signals and advanced communications systems. • The Nampa Police Department wants to be an active partner to use video to enhance law enforcement activities.
Functions	• Arterial Traffic Management • Incident and Emergency Management • Road Weather and O&M • Traveler Information
Key Needs	• Improved signal, communications, and system management infrastructure. • Development and build-out of TMC, co-located with police department. • Improving coordination with other transportation and emergency response agencies.
Forward Focus	• Planning, designing, and building city-wide TMC, along with needed infrastructure and management software.

Emergency Management and Law Enforcement

Multiple 911 dispatch centers in the Treasure Valley exist; they serve as public safety answering points, operate 24-7, and dispatch the appropriate law enforcement, fire, and/or life safety services. During dispatch and emergency response, they also coordinate with traffic management and operations agencies.

Key 911/dispatch centers in the Treasure Valley include:

- Ada County 911 Communications Center
- Canyon County Communications Center
- Nampa Police Dispatch Center
- Idaho State Police Regional Communications Center South
- StateComm (ITS statewide dispatch center)

Operational Priorities	• Emergency management and law enforcement agencies continue to work closely with transportation agencies and each other to support efficient and safe travel throughout the Treasure Valley.

Functions	• Incident and Emergency Management
Key Needs	• Enhanced, automated integration of data between transportation agencies and other emergency management/law enforcement agencies. • Access to, and limited control of, ITS assets and data to support emergency response and law enforcement activities (including CCTV cameras, signage, and traffic data).
Forward Focus	• Continuing to be an active partner with transportation agencies to collaboratively support the enhancement and operations of technology systems to ensure efficient and safe movement of traffic/people throughout the Treasure Valley.

State Communications (StateComm)

StateComm, part of the Idaho Department of Health and Welfare, provides emergency management, dispatch, and communications for emergency medical services (EMS), ITD, Idaho Department of Fish and Game, hazardous material incidents, public health emergencies, AMBER Alerts, and many other situations and scenarios. StateComm coordinates with regional agencies at the local, state, and federal level, depending on the scope of the incident. Sixty-five percent of StateComm's operations focus on ITD activities. Medical emergencies take precedence over StateComm's day-to-day traffic management and operations.

Operational Priorities	• StateComm is focused on traffic incident management statewide, including training, engagement, and implementation. • Continued strong relationship and support for ITD dispatch and 511 traveler information system data entry.
Functions	• Freeway and Arterial Traffic Management • Incident and Emergency Management • Road Weather and O&M • Traveler Information
Key Needs	• Ensuring proper implementation of traffic incident management principles. • Supporting ITD's efforts to deploy future system O&M software.
Forward Focus	• Conducting traffic incident management courses in the Treasure Valley. • Supporting effective region wide multi-agency coordination of operations.

Valley Regional Transit

VRT is the primary public transportation provider in the Treasure Valley and operates fixed route transit (ValleyRide) and Americans with Disability paratransit services, and coordinates other transportation services through a variety of partners such as local senior centers, TVT, Harvest Transit, and Rides2Wellness. VRT also supports ACHD's Commuteride vanpool program and the Boise GreenBike, bike share program. Additionally, TVT provides rural community transit and Medicaid transportation. Operations centers used for public transportation management include:

- ValleyRide Dispatch Centers in Boise and Caldwell
- VRT Meridian Call Center
- TVT Dispatch Center in Nampa

Operational Priorities	• VRT has accomplished significant foundational technology projects in the past five years. • Their goal is to leverage their successes and continue to utilize technology advances to enhance operational efficiencies, on-time performance, and safety in all transit operations.
Functions	• Public Transportation Management • Traveler Information • Customer Service (One-call center)
Key Needs	• Implement technology solutions that reduce customer's barriers to access, improve efficiency of operations, increase the utilization of transportation options by removing barriers between service providers, and enhance essential infrastructure.
Forward Focus	• Implementing the recently updated and approved the VRT Technology Plan, which includes numerous specific prioritized projects. • Report on the effectiveness of transit signal priority and explore opportunities to manage travel demand through additional priority treatments.

3 Emerging Technology Impacts and Considerations

This section focuses on the changing transportation landscape due to emerging technologies and changing user preferences, and their impact on the Treasure Valley's transportation system. Conventional ITS continues to evolve into integrated tools for use by transportation professionals implementing TSMO.

Networked ITS, combined with advancements in CAV can provide additional reporting and situational data to improve safety and mobility in the Treasure Valley. In addition to CAV, the rise in transportation network companies (TNCs) such as Uber and Lyft and micromobility companies (e.g., bike and electric scooter share companies) have changed the transit landscape across the U.S. Reduced transit ridership, as a result of a more competitive transportation landscape, has required transit agencies to take a more agile approach, establishing innovative partnerships for first mile/last mile mobility needs, or integrating new technologies that will allow for more efficient service delivery.

Consumer preferences for e-commerce, delivered in ever-shortening timespans, are placing additional pressures on transportation systems and infrastructure (e.g., wear and tear on roads) and increasing congestion along major corridors and in urban centers. E-commerce pressures, combined with the Treasure Valley's growth, increase the importance of keeping the region's freight corridors and roads operating efficiently and in a state of good repair.

3.1 Connected and Automated Vehicles

CAVs of varying capabilities are currently being tested by both the private and public sectors across the U.S (Figure 5). USDOT has funded three connected vehicle (CV) pilot projects in New York City, New York; Tampa, Florida; and the State of Wyoming to implement a suite of CV applications, each tailored to meet unique transportation needs.

Figure 5: Connected and Automated Vehicles

The CV pilot sites are all applying different types of CV technology. The New York City pilot aims to improve the safety of travelers and pedestrians through the deployment of Vehicle to Vehicle (V2V) and Vehicle to Infrastructure (V2I) technologies at signalized intersections and on a mixed

fleet of cabs, commercial deliver trucks, and city vehicles. The Tampa pilot will similarly deploy V2V and V2I technologies in downtown Tampa on private vehicles, buses, and volunteer pedestrians. The Tampa pilot will test multiple V2V and V2I applications address mobility, pedestrian and vehicle safety, and traffic monitoring. The Wyoming pilot will deploy V2V, V2I, and Infrastructure to Vehicle along I-80 and on Wyoming Department of Transportation's vehicles, snow plows, highway patrol, and commercial trucks. These are aimed at addressing safety, winter weather, situational awareness, work zone warning, and distress notifications.

In addition to USDOT funded activities for CVs, the private sector has been testing automated vehicles (AVs) across the U.S. (Figure 6). Ranging from low-speed shuttles to small to medium-sized vehicles, to trucks, multiple technology firms, TNCs, and vehicle manufacturers are testing AVs in mixed environments. State and federal regulations for testing and future deployment vary from state to state, and widespread deployment is not expected in the near-term. However, transportation agencies, first responders, and government agencies must prepare for the arrival of AVs on roads, operating in both the urban and rural settings, by incorporating flexible AV regulations in policy documents that have long time horizons.

Figure 6: Waymo Automated Vehicle

The Treasure Valley TSMO stakeholders understand the importance of these activities, from economic competitiveness, technological compatibility, and equity standpoints. AVs have multiple applications for surface transportation in the Treasure Valley and will need to operate safely in the existing built environment (e.g., roads and intersections and roadside equipment) over the long term. Specific CAV benefits include increasing efficiency and the safety of all transportation users, in addition to providing additional real-time reporting and performance data to TMCs.

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In 2018, the State of Idaho established an Autonomous and Connected Vehicle Testing and Deployment Committee to deal with the technological, regulatory, and policy impacts of these emerging technologies at the state level. The committee provided a report to the Idaho governor with multiple recommendations, including encouraging legislation that allows for autonomous vehicle testing and deployment and encouraging transit agencies to incorporate autonomous vehicles into their future transit plans.

At the local level, it is recommended that transportation agencies continue to perform regular roadway maintenance activities (such as high visibility signage and striping) that benefit all users, including AVs, as well as continue to expand the regional communications backbone that enables connected vehicle safety applications. The region can also continue to stay abreast of technology advances and federal, state, and local regulatory activities through recurring CAV-related discussion topics at future ROWG meetings.

3.2 Mobility on Demand and Mobility-as-a-Service

Figure 7: Lyft Transit Connections Service Area

TNCs, micromobility, and on-demand transit technologies have changed the mobility landscape across the U.S., providing additional user choice, flexibility, and connectivity. Building off this success, some transit agencies have forged partnerships with the TNCs and other micromobility companies to provide first and last mile connectivity, while others have integrated on-demand dispatching systems that increase the efficiency of transit service. These actions have spurred the development of new services for users and Mobility on Demand (MOD) and MaaS concepts. To meet the increased use of TNCs, the City of Boise is testing a new curbside pick-up and drop-off zone in downtown Boise. The new zone will provide a safe area for people to get in and get out of vehicles safely.

An example of the application of MOD for new and innovative approaches to transit in the Treasure Valley is VRT's multiple partnerships with Lyft, called Lyft Transit Connections and VRT Late Night.

Lyft Transit Connections allows users in Boise to use Lyft's ride-sharing services for $2 to/from 14 ValleyRide bus stops. This unique solution provides multimodal first mile/last mile connectivity to ValleyRide's core bus network (Figure 7).

In addition to Lyft Transit Connections, VRT also has an agreement with Lyft to provide late night service in the cities of Nampa and Boise, when VRT buses aren't running, for qualified low-income residents. Called VRT Late Night, the participant is responsible for a $3 fare and VRT pays up to $20 for the cost of the ride. The participant is responsible for any amount above $20 plus the original $3 fare.

Beyond MOD and vehicle-based transportation options, bike and scooter share have arrived in the Treasure Valley. Both types of transportation can be considered MaaS, providing subscription and one-time use payments, and include providers such as Boise GreenBike, and Lime and Bird scooter share companies (Figure 8).

Figure 8: Boise Green Bike

Though MOD and MaaS address mobility needs, they can create additional pressures on the region's transportation system, such as congestion at population centers (e.g., airports, stadiums after sporting event, etc.) and increased wear and tear on infrastructure. Shared micromobility also presents safety concerns, as scooters riders and cyclists could get into crashes with vehicles, requiring additional awareness from drivers and new infrastructure to enhance safety of bicyclists and scooter riders. Currently additional infrastructure such as protected bike lanes, sidewalks, pathways, and crossing beacons are being built and installed.

Going forward, COMPASS and its partners will continue to look for flexible approaches to harnessing the capabilities of TNCs to improve mobility for all. VRT also expects to continue partnering with TNCs, and integrating on-demand transit technologies where applicable, as a tool to provide equitable service, address changing user preferences, and benefit from technological changes.

3.3 Maintaining Freight Mobility

Over $27.3 billion of commodities flow in and out of the Treasure Valley, and account for up to 29% of the region's total gross domestic product every year. As noted in CIM 2040 2.0 and COMPASS's 2018 freight study [2], the safe and efficient transport of freight is vital for the region's continued economic growth and competitiveness. However, the rise of e-commerce and consumer preference for ever-shortening delivery windows have placed additional pressures on freight companies to adapt and compete in this new business environment, as well as placing new pressures on the transportation system.

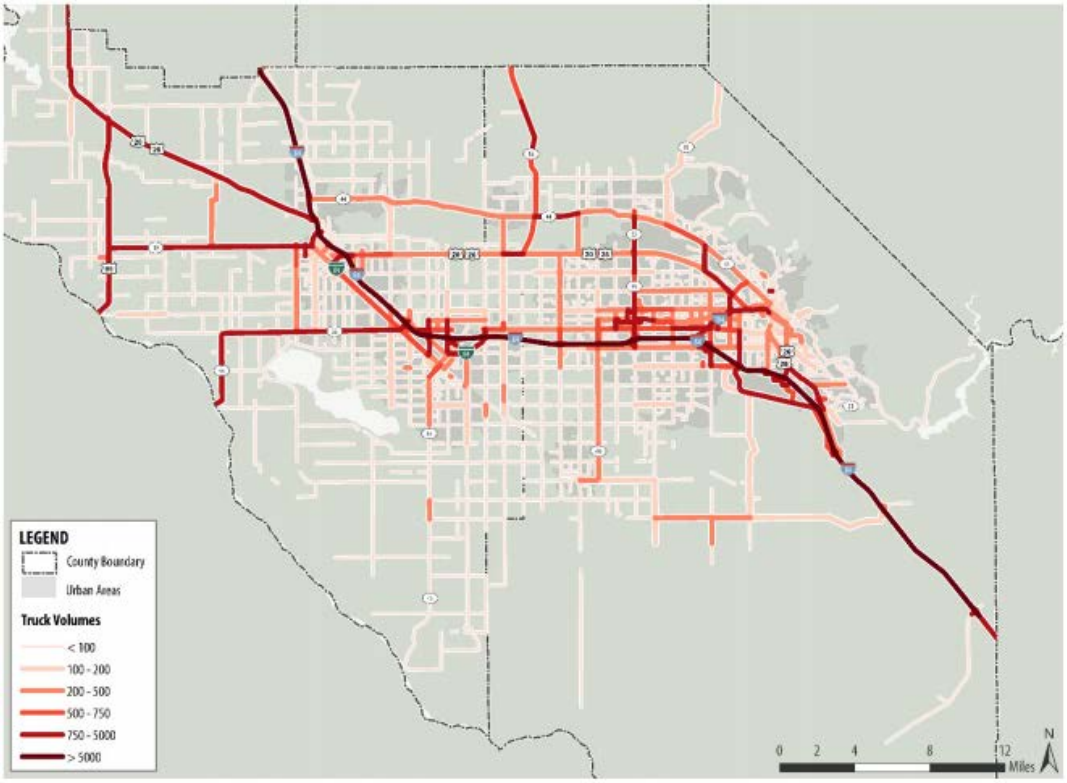

Figure 9: Truck Volumes in the Treasure Valley

Whereas freight companies previously used large trucks for deliveries to traditional brick and mortar stores from depots, deliveries are now being made directly to customers at residential and commercial addresses. Deliveries are increasingly being performed by contracted staff using personal vehicles or freight companies using additional smaller box trucks to fit in urban centers, resulting in an increase in the number of delivery vehicles on roads, additional congestion, and additional wear and tear on the region's infrastructure.

To address increasing freight and delivery congestion, COMPASS and its stakeholder agencies have invested in multiple studies to identify freight corridors and bottlenecks (Figure 9), solicited

[2] COMPASS Freight Study
https://www.compassidaho.org/documents/prodserv/CIM2040_20/COMPASS%20Freight%20Study%20Final%20Report_June%202018.pdf

industry input via a Freight Advisory Workgroup, and prioritized capital projects that address congestion mitigation and increased wear and tear. In addition to studies and capital improvement projects, agencies have implemented enhanced signal timing and traffic management capabilities. A potential future virtualized regional TMC would further enhance the region's ability to monitor and manage developing congestion issues, including freight congestion.

4 Regional TSMO Toolkit

The TSMO Toolkit identifies strategies that the region will employ to actively manage the multi-modal regional transportation system. Toolkit strategies are enabled by ITS technologies, but staffing, policies, plans, training, and other factors are equally important to successfully implementing the toolkit in the Treasure Valley.

Toolkit strategies are often applicable at the individual agency and the regional level, with maximum benefit realized when agencies collaborate to seamlessly address operational needs and challenges.

Many of the TSMO strategies initially identified for the region have already been implemented through various projects and initiatives. Therefore, it is important to further refine the TSMO strategies from the previous plan and carry forward strategies that meet the region's changing transportation needs.

The TSMO Toolkit strategies are reflected in agency and regional implementation plans and projects. The toolkit incorporates feedback received from agencies and stakeholders, and consideration of technological, economic, and demographic changes in the region. Several of the toolkit strategies are mainstays of regional operations programs, and have been integrated into agency day-to-day policies and operations.

The toolkit strategies are grouped into thematic categories as follows:

- **Regional Transportation Operations, Coordination, and Management:** Establishes planning efforts and communication to encourage regional cooperation and coordination. The foundation for effective planning for operations, this group of strategies involves multiple stakeholders across the transportation system, including transportation agencies, infrastructure owners and operators, and emergency and incident response teams working to implement regional system management programs. The goal of these strategies is to create a more "seamless" transportation system across jurisdictional boundaries.
- **Freeway Management:** Requires multi-jurisdictional coordination and uses operations, management, and performance tools to proactively manage freeways to improve safety, efficiency and reliability.
- **Arterial Management:** Uses advances in operations, management, and performance tools applied to arterial corridors to ensure traveler safety, efficiency and reliability. This group of strategies requires coordination across jurisdictional boundaries where the corridor is located.
- **Incident and Emergency Management:** Aims to efficiently coordinate response to, and recovery from, traffic incidents and emergencies.
- **Traveler Information:** Harnesses the widespread availability and dissemination of traveler information through DMS, agency websites, and mobile applications to provide travelers with personalized information to support informed travel choices.

- **Public Transportation Management:** Uses technologies such as Computer-Aided Dispatch/Automatic Vehicle Location, real-time passenger information, and transit signal priority to improve transit operational performance and enhance passenger convenience.
- **Road Weather Operations:** Uses sensing technologies and other tools deployed to accurately monitor, predict, and inform travelers and operators of roadway weather conditions with a goal of mitigating weather-related impacts on the transportation system.
- **Maintenance and Construction:** Involves multi-jurisdictional cooperation to ensure the coordination and planning of construction and maintenance responsibilities and activities.
- **Emerging Technologies Readiness:** Contains strategies to prepare for the expected emergence of CAV in the coming decades.

4.1 TSMO Toolkit Strategies

TSMO Toolkit strategies have been tailored in response to the needs expressed by stakeholder agencies, as well as the perceived capabilities to make meaningful progress towards implementation within the 10-year horizon of the TSMO plan. This reflects financial considerations as well agency priorities, technology maturity, and other factors.

The applicability of TSMO Toolkit strategies to individual agencies and the region was vetted through individual agency consultations as well as review by the ROWG.

Table 4, below, provides a brief description of each of the strategies included in the TSMO Toolkit, organized by category. For each strategy listed, a brief description is provided, which details how the strategy can be implemented, associated ITS infrastructure, and benefits of implementation.

Table 4: Descriptions of TSMO Strategies

Category	Strategy	Description and Associated Benefits
Regional Transportation Operations, Coordination, and Management	Traffic and CCTV Monitoring	Uses video and detection equipment (e.g., detectors, vehicle/cell phone probe) to monitor traffic and congestion across the transportation network. Improves operations, incident detection, response, and verification times, while providing real-time and historic operation data. Supports the dissemination of real-traveler information.
	Transportation Demand Management	Develops response plans to traffic operations based on current and forecasted network performance. Coordinates transit, parking, tolling, and ramp metering management. Reduces network congestion on arterials and freeways, increases parking availability, and improves alternative mode choice.
	Multi-Agency Operations, Coordination, and Planning	Involves the creation of multi-jurisdictional committees to identify regional needs, promote resource sharing, plan, invest, and evaluate coordinated ITS and foster interagency cooperation.
Freeway Management	Ramp Metering	Meters traffic flow rates at freeway on-ramps adjacent to freeway sections and recurrent congestion. Reduces mainline travel delays, increases travel time reliability during

Category	Strategy	Description and Associated Benefits
		peak periods, and increases freeway speed and carrying capacity by up to 10%.
	Active Traffic Management	Manages congested corridors based on prevailing and predicted traffic conditions. Uses advances in adaptive transportation infrastructure such as ramp meters and traffic signals to increase throughput during congested periods.
Arterial Management	Enhanced Traffic Signal Operations	Improves existing traffic signal operations through detection of vehicles, re-timing, optimization, and implementation of traffic signal performance measures. Reduces travel times by 10-25% and increases safety, throughput, and reliability for all users.
	Pedestrian and Bicycle Operations Safety	Manages the detection and warning systems that interact with pedestrians, cyclists, or other mixed road users. Improves safety for all road users and promotes active transportation.
Incident and Emergency Management	Regional Incident and Emergency Management	Uses and refines current incident response programs to support quick, safe, and coordinated response, and support first-responder safety. Improves emergency and incident response, duration, clearance times, and secondary crashes by 25-70%.
	Emergency Vehicle Routing and Signal Preemption	Allows emergency vehicles to pre-empt traffic signals. Improves emergency vehicle reliability and response times.
	Regional Alert System	Leverages current and future traveler information and dissemination systems to alert the public of emergency situations by effectively providing advanced warning to travelers.
Traveler Information	Roadside Traveler Information Management	Uses DMS and HAR to provide travelers with information to make informed choices. Can improve travel time reliability and reduce delays.
	Regional Traveler Information	Provides static and real-time traveler information regarding incidents, roadway construction, transit routes, and departure/arrival times from all regional agencies to one central system which disseminates information to third-parties (i.e., websites, navigation applications, or mobile alerts). Can reduce delays by up to 20%, increase traveler satisfaction, and increase the use of alternate modes.
	Trip Planning and Routing Website	Trip planning and routing tools enable travelers to make informed travel decisions both pre-trip and en-route. Increases the attractiveness of transit and enhances passenger convenience.
Public Transportation Management	Advanced Transit Operations Management	Uses computer aided dispatch, automatic vehicle location, and automatic passenger counting technologies to enhance transit operations, better understand current operations, and

Category	Strategy	Description and Associated Benefits
		make real-time adjustments to improve transit service, reliability and efficiency, and user experience.
	Regional Transit Fare Integration	Uses integrated fare media to collect transit fare payments across multiple jurisdictional boundaries. Enhances passenger convenience and improves money-handling efficiencies.
	Multimodal Travel Coordination	Improves connections between transit and other modes of transportation to reduce delays and missed connections. Makes transit a more attractive choice and improves transit user experience.
	Real-time Transit Information	Provides real-time transit and arrival information by using a variety of means, such as wayside signs, in-vehicle systems, and interactive mobile device applications. Reduces passenger wait times at stops and increases passenger convenience.
	Transit Signal Priority	Uses existing technology to allow transit vehicles to receive extra green time at signalized intersections. Improves transit time reliability, passenger throughput, and on time performance.
	Transit Traveler Information through Third-Party Services	Harnesses the internet to provide users with detailed information on transit schedules, route and map information, trip planning, and real-time arrivals and departures. Allows transit users to view this information in third party applications such as Google Maps™ or Apple Maps™.
	Mobility-as-a-Service and First Mile/Last Mile Connections	Packages all transportation costs and trip planning functions together into a single integrated service. Uses transportation network and micromobility companies or other shared mobility providers to offer enhanced connectivity in communities and improves first mile/last mile connections. Can reduce the use of single occupancy vehicles, promote active transportation, and provide greater accessibility for those with disabilities or low incomes.
Road Weather	Weather Information Processing and Distribution	Monitors and predicts adverse weather impacts on the roadway network and mitigates adverse conditions. Can improve traveler information, increase travel time reliability, and improve safety during adverse weather events.
	Weather Data Collection	Uses RWIS deployed in the field to collect data from Environmental Sensor Stations. Improves weather and roadway condition predictions and their impacts on the transportation system.
	Weather Adaptive Traffic Management	Establishes coordinated action plans during adverse weather events. Manages traffic speed and flow in real-time though DMS and other systems. Average vehicle speed is reduced by up to 5 mph during adverse weather, lowering the occurrence of crashes by up to 15%.

Category	Strategy	Description and Associated Benefits
	Winter Roadway Maintenance	Uses multi-jurisdictional agreements to ensure timely and effective winter roadway maintenance (e.g., snow plow, road salting, etc.) during adverse weather conditions.
Maintenance and Construction	Maintenance and Construction Management	Establishes coordinated plans and best practices for scheduled and unscheduled roadway maintenance. Improves worker and traveler safety during maintenance and construction activities and reduces delays on associated corridors.
	Maintenance and Construction Activity Coordination	Disseminates maintenance and construction activities to the TMC, which then forwards this information to interested parties and travelers. Reduces maintenance and construction-related disruptions and allows the TMC to make adjustments to location, speed, and traffic flow and ultimately provide this information to travelers.
	Work Zone Management	Uses variable speed limits and traveler information to increase awareness and safety of work zones. Reduces travel speed in work zones, improves safety, and increases travel time reliability.
Emerging Technologies	Connected and Automated Vehicle Readiness	Uses federal guidance on CAVs for future deployments and compatibility with current and future ITS infrastructure and the built environment. Ensures ITS (where applicable) can send and receive data from CAVs, including situational, traffic management, and incident management data. As recommended in the *2018 Autonomous and Connected Vehicle Testing and Deployment Committee Report*, VRT is working with state and local stakeholders to pilot autonomous vehicle technology and incorporate into transit plans.
	Electric Vehicle Readiness	VRT is acquiring electric buses to replace aging diesel and compressed natural gas buses for fixed route service. With the arrival of electric buses comes the need to plan for supporting charging infrastructure.

Implementation and use of the TSMO categories and strategies is expected to vary by stakeholder depending upon responsibilities in the Treasure Valley's transportation system. Using information derived from stakeholder interviews, the completed and planned project list, and input received from multiple ROWG meetings, the consultant team determined each strategy's application to each stakeholder and vice-versa. Table 5, below, displays this relationship and is intended to be updated as stakeholder responsibilities or TSMO strategies change over the life of this TSMO plan.

Table 5: TSMO Strategies by Stakeholder

		Traffic and CCTV Monitoring	Transportation Demand Management	Multi-Agency Operations Coordination and Planning	Ramp Metering	Active Traffic Management	Enhanced Traffic Signal Operations	Pedestrian and Bicycle Operations Safety	Regional Incident and Emergency Management	Emergency Vehicle Routing and Signal Preemption	Regional Alert System	Roadside Traveler Information Management	Regional Traveler Information	Trip Planning and Routing Website	Advanced Transit Operations Management	Regional Transit Fare Integration	Multimodal Travel Coordination	Real-time Transit Information	Transit Signal Priority	Transit Traveler Information through Third-Party Services	Mobility-as-a-Service and First Mile/Last Mile Connections	Weather Information Processing and Distribution	Weather Data Collection	Weather Adaptive Traffic Management	Winter Roadway Maintenance	Maintenance & Construction Management	Maintenance & Construction Activity Coordination	Work Zone Management	Connected & Automated Vehicle Readiness	Electric Vehicle Charging
		Regional Transportation Operations, Coordination and Management			**Freeway Management**		**Arterial Management**		**Incident & Emergency Management**			**Traveler Information**			**Public Transportation Management**								**Road Weather**				**Maintenance & Construction**			**Emerging Technologies**	
Transportation Agencies	ITD District 3	●	●	●	●	●	●	●	●	●		●	●	●								●			●	●	●	●	●	
	ITD Headquarters	●		●					●		●	●	●	●								●	●		●		●		●	
	ACHD	●	●	●		●	●	●	●	●		●	●	●								●			●	●	●	●	●	
	City Of Caldwell	●		●			●	●	●	●			●												●	●	●	●		
	City Of Nampa	●		●			●	●	●	●			●												●	●	●	●		
Emergency Response	Idaho EMS (Statecomm)	●		●					●	●	●	●	●	●								●	●			●	●			
	Idaho State Police	●		●					●	●	●																			
	Ada County Sheriff			●					●	●	●																			
	Canyon County Sheriff			●					●	●	●																			
	Nampa Public Safety			●					●	●	●																			
	Other Emergency Management Agencies	●		●					●	●	●																			
Public Transportation	Valley Regional Transit			●					●				●	●	●	●	●	●	●	●	●					●		●	●	●
	Treasure Valley Transit			●					●				●	●	●					●						●		●		

5 Putting the Pieces Together: The Regional ITS Architecture

5.1 Introduction to the ITS Architecture

The Regional ITS Architecture has existed in the region for a number of years and serves as a resource for inventorying and tracking existing and planned projects. It illustrates how the ITS infrastructure communicates and interconnects with different stakeholders and the built environment to provide a reference for local agencies to support transportation technology deployments. The architecture also identifies needs and high-level concepts for future projects. FHWA also requires that agencies can demonstrate compliance with the ITS architecture for federally funded projects. FHWA provides a detailed description of the ITS architecture and how to use it in the *Regional ITS Architecture Guidance Document*.[3]

Since the last Treasure Valley Regional ITS Architecture update in 2014, the National ITS Architecture has changed significantly. For instance, the connected and autonomous vehicle service packages have been combined with Turbo Architecture services into the Architecture Reference for Cooperative and Intelligent Transportation (ARC-IT). ARC-IT combined overlapping services between the two architectures and new service packages. Within ARC-IT, regional agencies can use two software packages for ITS architecture updates or systems engineering. ITS architectures can be updated using the RAD-IT software. The Systems Engineering Tool for Intelligent Transportation (SET-IT) software can be used for systems engineering activities to support development of specific projects.

The architecture is stored electronically as a database file that can be opened with the free RAD-IT software. RAD-IT helps the user identify service packages (ITS services the region intends to provide) that apply to various ITS applications as shown in Figure 10.

Figure 10: Service Package Groups by Function Area

[3] Regional ITS Architecture Guidance Document: https://ops.fhwa.dot.gov/publications/regitsarchguide/index.htm

The service package categories listed above contain from two to 23 subcategories that include more detailed descriptions of individual services. For example, Transit Signal Priority is a service package within the Public Transportation group. Service packages along with descriptions can be found on the National ITS Reference Architecture website.[4] Appendix A includes a list of existing and planned service packages for the regional architecture.

In addition to service packages, there are various other data elements that must be entered and customized to create the Regional ITS Architecture, including:

- **Stakeholders:** Description of each key stakeholders in the region. Stakeholders may also be clustered into groups.
- **Inventory elements:** All ITS inventory in the region, with each inventory element mapped to a responsible stakeholder and a correlating ITS architecture subsystem or terminator.
- **Interconnects/Information flows:** Detailed description of Interconnects and information flows between devices and stakeholder.
- **Standards:** Potentially-relevant ITS standards.

Figure 11 illustrates the Treasure Valley physical architecture diagram.

[4] National ITS Reference Architecture: https://local.iteris.com/arc-it/html/servicepackages/servicepackages-areaspsort.html

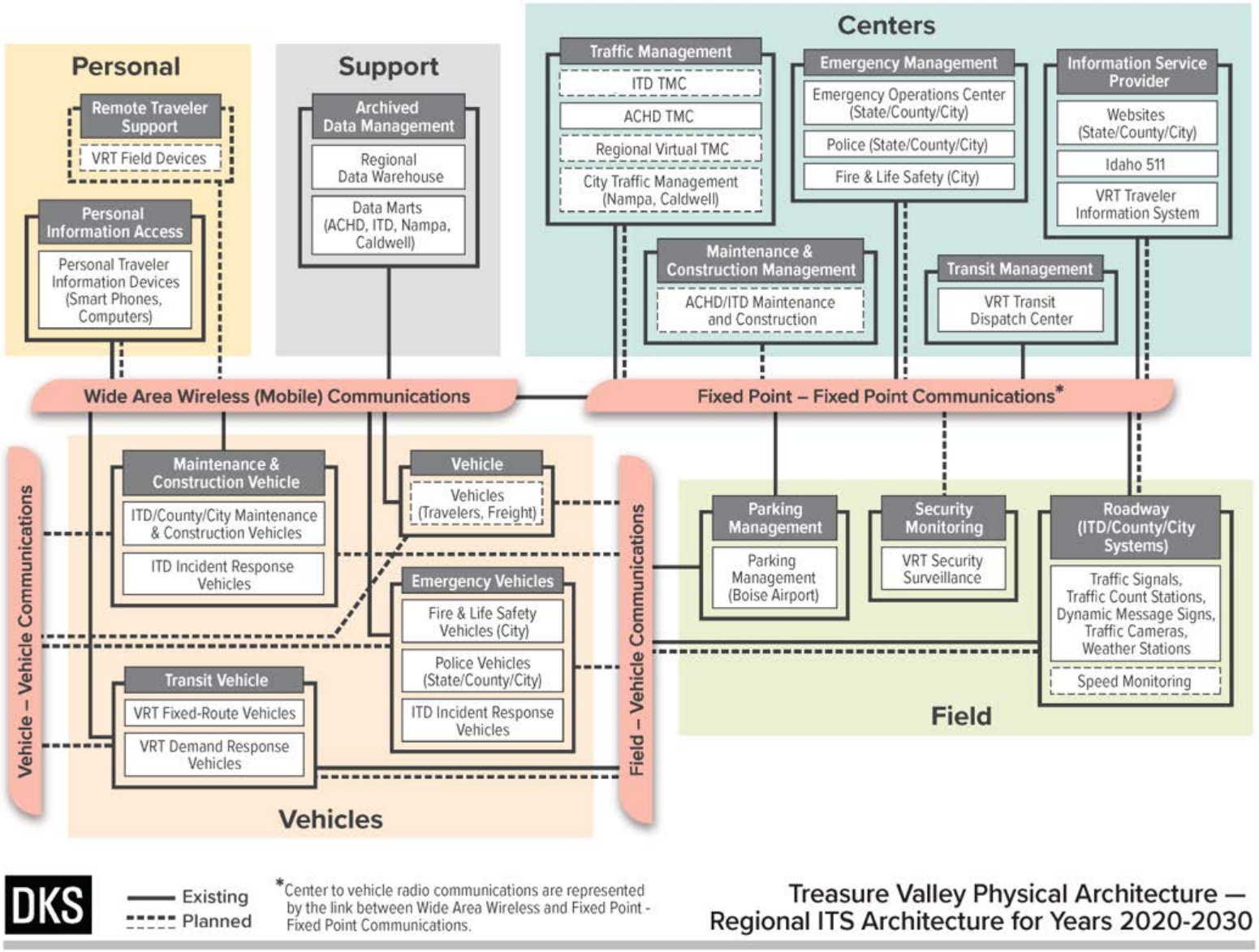

Figure 11: Treasure Valley Physical Architecture

For the 2019 update, the stakeholders, system inventory, service packages, information flows, and standards were all reviewed and evaluated for currency. The updated information was gathered through the stakeholder needs assessment process.

Stakeholders

The stakeholders in the region have remained consistent overall; Nampa Highway District #1 (NHD) was the only new stakeholder identified. NHD develops roadway projects in the area around the City of Nampa. Typically, NHD completes the construction of projects and turns ownership over to the City of Nampa if it is near the city limits. Appendix B lists all new and existing stakeholders.

Inventory Elements

This update to the ITS architecture includes several new inventory elements:

- Caldwell Traffic Management Center: Introduces the City of Caldwell as an emerging traffic management center.
- Nampa Highway District #1 Field Equipment: Recognizes the increasing implementation of ITS in the City of Nampa.
- Nampa Traffic Management Center – Emergency Operations Center (TMC-EOC): Represents the City of Nampa's plans to fully build out the TMC-EOC in the near term.
- Regional Virtual Traffic Management Center: A concept to virtualize shared TMC operations among partnering agencies in the region to increase cooperation and communication during incidents and events.

Appendix C lists all existing and new inventory elements.

Service Packages

Several new service packages are included in the ITS architecture update. These services fulfil planned project needs and involve emerging technologies that should have benefits for regional transportation. The new services include:

- CVO06 – Freight Signal Priority
- DM02 – Performance Monitoring
- MC09 – Infrastructure Monitoring
- PS06 – Incident Scene Pre-Arrival Staging Guidance for Emergency Responders
- PS07 – Incident Scene Safety Monitoring
- PT11 – Transit Pedestrian Indication
- PT12 – Transit Vehicle at Station/Stop Warnings
- PT18 – Integrated Multi-Modal Electronic Payment
- SU01 – Connected Vehicle System Monitoring and Management
- SU07 – ITS Communications
- SU11 – Field Equipment Maintenance
- SU12 – Vehicle Maintenance

- TI03 – Dynamic Route Guidance
- TM04 – Connected Vehicle Traffic Signal System

The addition of service packages illustrates how the region is growing and maturing in the types of ITS projects under consideration, including areas that have more traditional safety and maintenance systems with newer technologies such as connected vehicle systems.

Planned Projects

Information on planned ITS projects was provided by the key stakeholders, including ITD, COMPASS, local highway districts, cities, transit agencies, and emergency responders/police departments. Within the regional architecture, project groupings can be used to classify similar regional projects. The proposed projects resulted in changes to existing groups, as well as the creation of new regional groupings. These new project groupings include:

- ACHD Maintenance and Construction Data Center
- Asset Management
- Automated Traffic Signal Performance Measures
- Caldwell Traffic Management Center
- Connected and Autonomous Vehicle Deployments
- Integrated Active Corridor Management
- Nampa TMC – EOC
- TSP Expansion
- VRT Fare Payment and Mobility on Demand
- Wireless Expansion

5.2 Applying the Architecture: City of Nampa Example

Within the Regional ITS Architecture, each identified project includes the stakeholders, inventory elements, services, and functions that are needed. An example is the new Nampa TMC-EOC.

To incorporate the Nampa TMC-EOC into the architecture, first the stakeholders are defined. In this case, the stakeholders include the City of Nampa, ITD District 3, ACHD, and regional emergency management. Once the stakeholders are identified, applicable inventory elements that are associated with each stakeholder are identified. In this case, the Nampa TMC-EOC will make use of Nampa and ACHD field equipment and police vehicles/equipment. Key traffic management services that the center will perform are then selected, which include:

- TM01 – Infrastructure-Based Traffic Monitoring
- TM03 – Traffic Signal Control
- TM06 – Traffic Information Dissemination
- PS02 – Emergency Response

Finally, functions are selected from a detailed list of potential system capabilities. The functions are important because they include the type of data that each inventory element will communicate. This customization of the architecture then guides the types of information that various stakeholders will exchange with each other's systems.

Once the functions are completed, RAD-IT can generate diagrams to show how the information flows between inventory elements. Figure 12, below, shows an example of the data interconnect in the Nampa TMC-EOC. Figure 13 shows a sample data flow diagram from RAD-IT.

This diagram is simplified for clarity and only includes data flows shared between ITD field equipment and the Nampa TMC-EOC.

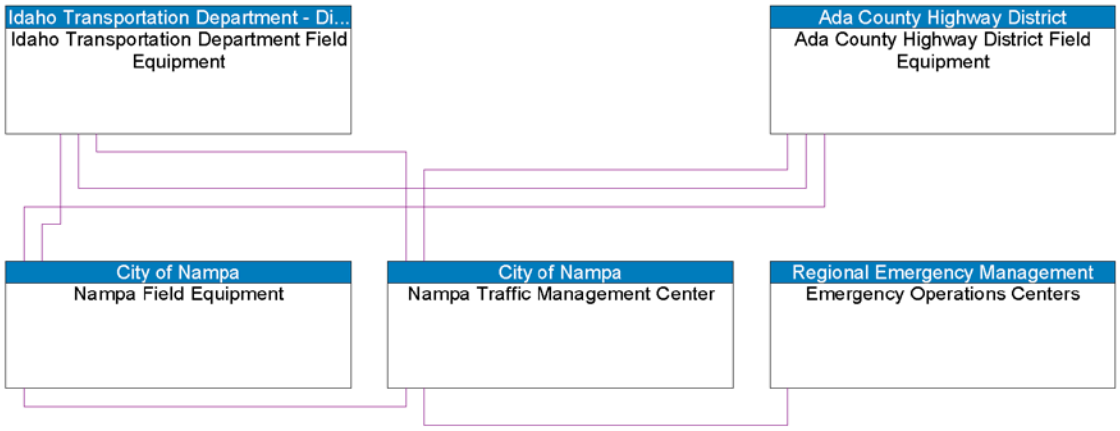

Figure 12: Nampa TMC-EOC Data Interconnects

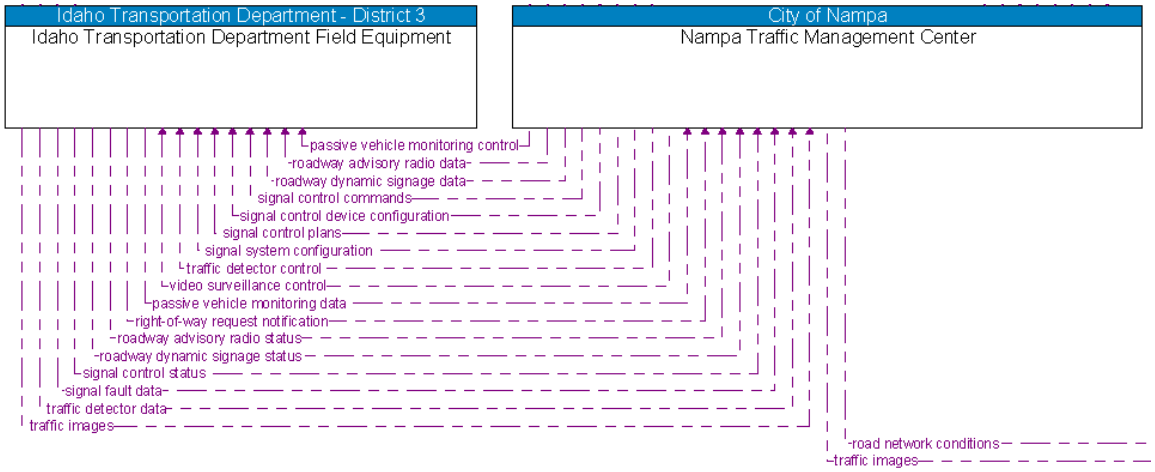

Figure 13: Nampa TMC-EOC Example Data Flow Diagram

These diagrams can be generated as needed to provide agencies with documentation for FHWA funding requests and project development activities.

5.3 ITS Architecture Maintenance

The ITS Architecture should be a living document that is updated as things change. Common reasons the Treasure Valley Regional ITS Architecture will need updating include:

- A stakeholder identifies a new strategy/ITS service that could be implemented to meet a need
- A stakeholder needs to show a project architecture as part of a project being implemented
- FHWA updates the National ITS Architecture with new service packages or information flows that should be included in the Treasure Valley
- The region implements a new inventory element not previously identified

The following describes responsibilities for updating the architecture:

- **Who?** COMPASS will be the keeper and maintainer of the architecture. COMPASS will coordinate with state and local agencies to gather information on new projects and/or other updates that are needed.
- **When?** Once per year. This annual update will coincide with the yearly GIS-based ITS inventory update.

6 Communications Priorities

Communications infrastructure plays an important role in transportation management, as it provides connectivity to field ITS devices, such as traffic signals, CCTV cameras, and DMS signs. Since 2012, the region's ITS centrally-connected devices and related traffic monitoring and management capabilities have developed substantially.

Harnessing connected ITS has also given transportation agency personnel additional vital tools for determining traffic bottlenecks, responding to and managing incidents, and providing situational data and camera feeds to emergency responders and peer agencies.

Communications infrastructure, specifically the Treasure Valley's fiber network, has developed substantially over the last five years. Over 545 miles of publicly- and privately-owned fiber provides connectivity to ACHD, ITD, and Cities of Boise, Caldwell and Nampa, resulting in a robust and reliable communications network across the region that can be seen in **Error! Reference source not found.**.

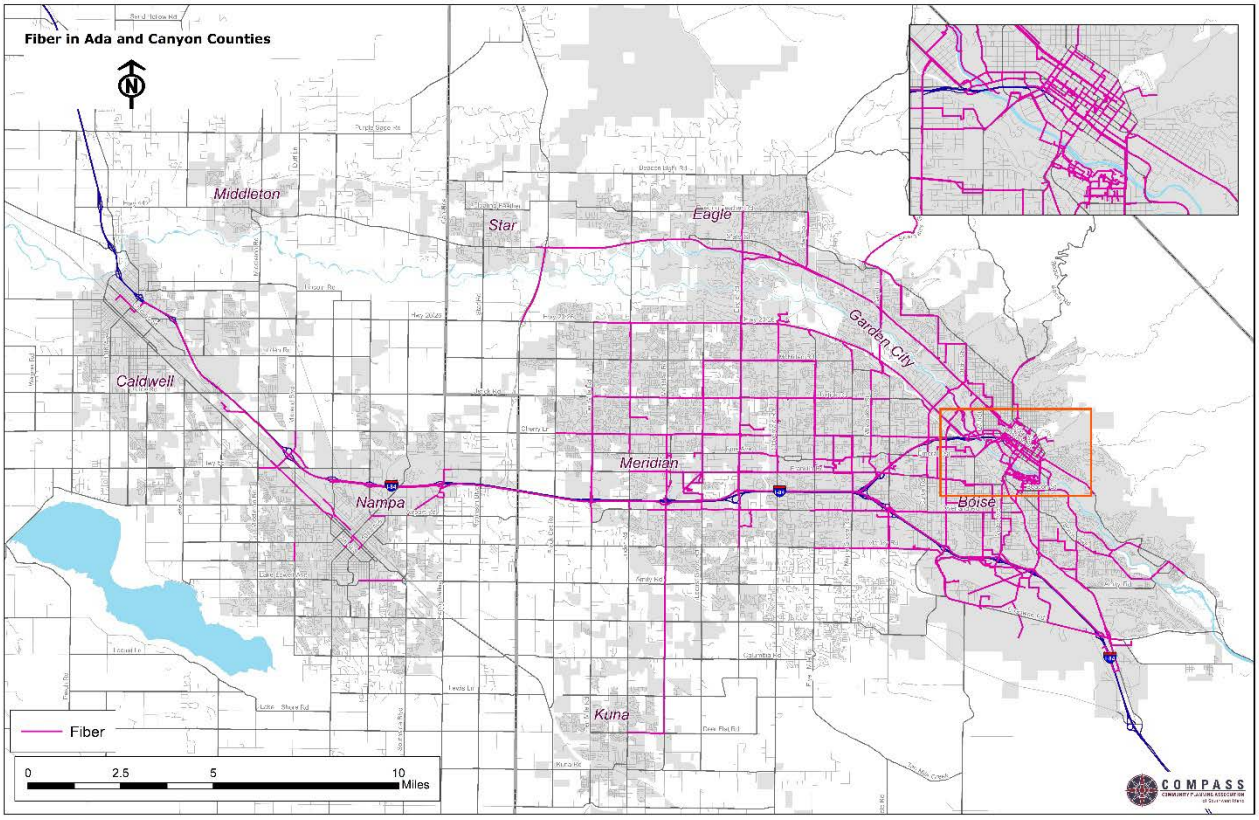

Figure 14: Regional Fiber Infrastructure

Previous communications plans have highlighted the Treasure Valley's planned communications network buildout and noted network capacity, infrastructure, and redundancy needs. Using feedback received from stakeholders at the ROWG and one-on-one meetings, as well as the completed and planed project list, the following objectives have been identified for the region's communications assets:

- **Maintain and expand the region's fiber network.** Transportation and emergency management agencies continue their commitment to the region's fiber communications

network. ACHD, ITD, City of Caldwell, and City of Nampa are planning to invest over **$5.6 million** in projects to maintain and further expand the region's fiber network. The fiber network will be resilient and reliable via the use of redundant loop communications and have network speeds up to 10 gigabits. The improved fiber network will allow for the deployment of additional ITS devices used to monitor traffic conditions, respond to incidents, and improve inter-agency collaboration across the region. For example, the plans currently under development to build a TMC in the City of Nampa note that an extensive expansion of the fiber optic network is necessary to be successful.

- **Prepare for the strategic, incremental expansion of the fiber network.** The agencies intend to further enable future communications infrastructure by installing conduit during new construction or maintenance activities (when applicable). Installing conduit at new builds and during maintenance activities reduces the costs of adding conduit and fiber later, allowing for the incremental expansion of the region's ITS and communications infrastructure network. The City of Boise has recently installed new fiber conduit along Cloverdale Road from W Franklin Road to the south side of I-84.
- **Continue event and incident data sharing and expand camera sharing capabilities.** The Ada County TMC provides event and incident data and video to first responders on an as-needed basis, while the TMC is staffed. Multiple stakeholders expressed that the data and camera feeds provided are extremely valuable but are limited to when the TMC is open. In the future, ACHD intends to provide camera feeds and incident data during hours when the TMC is closed, possibly through control-sharing agreements. Expanding data and camera sharing capabilities will increase interagency collaboration, and further increase the value of investments made in the fiber network and ITS.
- **Increase regional traffic monitoring and incident and emergency management collaboration via a future virtual regional TMC.** As multiple agencies own, operate, and maintain separate ITS devices and fiber in the Treasure Valley, interagency collaboration can be challenging. Previously, agencies expressed interest in establishing a co-located brick-and-mortar multiagency regional TMC. However, advancements in communications and cloud-based systems have enabled the potential of a "virtual" regional TMC for the City of Nampa, City of Caldwell, ACHD, and ITD. The virtual TMC would allow for the sharing of ITS resources, integration of central and field systems, and shared CCTV control and monitoring, all via workstations at the individual agency offices.

These objectives highlight the need to maintain and expand the region's fiber network and communications capabilities. While prior plans have considered fiber-sharing agreements between emergency management and traffic management agencies, the general experience has been that agencies have been able to deploy the necessary linkages on their own. The agencies will continue to build out strategically as needed to provide communications in areas of high growth, as identified in the TSMO Implementation Plan project list in Appendix D.

7 Measuring and Managing Performance

A widespread push for public agencies to increase their transparency through performance reporting, coupled with the availability of new data and data analytics tools, have helped transportation agencies to more effectively assess the impacts of TSMO strategies, identify needs and system performance deficiencies, and better manage the transportation system.

The region's MPO, COMPASS, gathers data and performance measures for regional and federal reporting performance requirements. In the 2012 TSMO plan, potential data sources and performance measures were proposed, but due to limited resources, were not fully implemented. However, in 2017, FHWA finalized the rulemaking process for performance measures related to the national highway system, infrastructure condition, and congestion mitigation as mandated by MAP-21 and the FAST Act. Conformance with these performance measures could impact where ITD spends federal funds. For example, if the safety targets are not met, FHWA may require ITD to allocate more federal funds to safety projects.

In December 2018, the COMPASS Board of Directors adopted CIM 2040 2.0, which assisted in establishing a framework to quantify and normalize the values of different types of regional investments across eight elements: **transportation, land use, housing, economic development, open space, health, farmland,** and **community infrastructure.** Performance measures are assigned to each element. The assessment of performance measures for the transportation element assists COMPASS in quantitatively evaluating the ability of current and future projects to meet the changing needs of the region, and also supports more objective and transparent decision-making.

TSMO and the strategies proposed are part of the Treasure Valley's transportation system and fall under the purview of multiple agencies and stakeholder initiatives. The performance measures identified in CIM 2040 2.0 are a natural fit, as they are already being measured by COMPASS for regional and federal reporting purposes. COMPASS develops a biennial performance monitoring report (called "Change in Motion") which highlights prior, current, and trajectory performance measures. The report is available on the COMPASS website.

Table 6: COMPASS Regional Performance Measures for TSMO, shows a subset of transportation metrics that have been identified as the priorities most closely related to TSMO and ITS.

Table 6: COMPASS Regional Performance Measures for TSMO

CIM 2040 2.0 Metric Category	Metric Detail
Safety	Motor Vehicle Safety: • Number of Motor Vehicle Fatalities • Number of Motor Vehicle Serious Injuries • Rate of Motor Vehicle Fatalities • Rate of Motor Vehicle Serious Injuries Non-motorized Safety (Bike and Pedestrian Crashes): • Number of Non-Motorized Fatalities and Non-Motorized Serious Injuries

Pavement and Bridge Conditions	Pavement Conditions: • Percentage of Interstate Pavement in "Good" condition • Percentage of Interstate Pavement in "Poor" condition • Percentage of Non-Interstate National Highway System Pavement in "Good" condition • Percentage of Non-Interstate National Highway System Pavement in "Poor" condition Bridge Conditions: • Percentage of Bridges in "Good" Condition • Percentage of Bridges in "Poor" Condition
System Performance (Motor Vehicle and Freight)	System Reliability: • Interstate Travel Time Reliability • National Highway System Travel Time Reliability • Truck Travel Time Reliability Interstate Index • Congestion Mitigation Air Quality Emissions
Active Transportation	Multimodal Use: • Bicycle Volumes • Pedestrian Volumes • Miles of Bikeways
Public Transportation	Transit Use: • Transit Passenger Ridership • Number of Vanpools • Non-Single-Occupancy Vehicle Mode Share • On-Time Performance Transit State of Good Repair: • Rolling Stock • Facilities • Infrastructure

8 Implementing the Plan and Achieving the Vision

This section provides a discussion of strategies to achieve the vision for TSMO in the Treasure Valley over the next ten years. Additionally, this section offers suggestions for near-term activities that can be undertaken by agencies (individually and through regional partnerships) to sustain the momentum of plan development and achieve success.

8.1 About the TSMO Implementation Plan

The TSMO Implementation Plan, as developed during the creation of the TSMO Strategic Plan, contains 131 projects identified by multi-modal transportation and emergency management agencies across the region, as shown in Table 7. The complete list of implementation plan projects is provided in Appendix D.

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Each category in the TSMO Toolkit is covered in the Implementation Plan, with most projects (50) in the Arterial Management category; Public Transportation (21 projects) and Regional Transportation Management (17 projects) have the second and third most, respectively.

Projects are identified as near-term, medium-term, and long-term, and include specific years for projects that are programmed. The total capital cost estimate for projects identified as near-term is approximately $22.4 million. Costs by stakeholder are provided in Table 8.

Table 7: Projects by Stakeholder

Stakeholder	Projects
ACHD	33
City of Caldwell	11
City of Nampa	15
COMPASS	4
ITD Headquarters	15
ITD District 3	29
VRT	20
Other	4

Table 8: Costs by Stakeholder

Stakeholder	Estimated Cost
ACHD	$5.5M
City of Caldwell	$1.3M
City of Nampa	$6.2M
COMPASS	$0.5M
ITD Headquarters	$4.1M
ITD District 3	$2.5M
VRT	$1.1M
Other	$0.7M

COMPASS will assume responsibility for maintaining and updating the implementation plan project list. The list was developed in electronic format for ease of regular revisions as progress is made towards implementation, and/or agency needs and priorities change. A multi-agency review of the project list is anticipated approximately once annually following plan completion.

8.2 Implementing the TSMO Priority Projects

During the development of the TSMO Strategic Plan, participating agencies identified priority projects to be undertaken in the next one to three years. This list, shown in Table 9, provides a set of focused objectives for TSMO implementation following completion of the plan.

While not all of the projects are fully funded and ready for deployment, there are immediate actions that can be undertaken for each to maintain momentum and make progress toward the self-identified top objectives in the implementation plan.

Table 9: Self-Identified Priority TSMO Projects by Agency (2019)

Agency	TSMO Implementation Plan Priorities
ITD Headquarters	• Upgrade StateComm central systems • Implement incident traffic management in the Treasure Valley • Replace ITS control software • Integrate 511 with other agencies and programs • Decommission HAR systems
ITD District 3	• Implement Eagle Road traffic signal performance measures • Develop regional concept for transportation operations to determine shared regional objectives for transportation operations and determine what is needed to achieve the object. This will be used for the future regional virtual TMC • Prepare I-84 Corridor Operations Plan
Ada County Highway District	• Complete Three Cities River Crossing ITS deployment • Install Advanced Traffic Signal performance measures System • Update signal timing • Update/develop standard specifications (ITS and communications)
Valley Regional Transit	• Implement Transportation Wallet fare integration system • Implement AVAIL Business Intelligence Module • Implement upgrades to public transportation scheduling software • Implement digital mobile advertising • Report on existing TSP applications and identify opportunities for future expansion.
City of Nampa	• Design/build TMC • Upgrade fiber optic communication
City of Caldwell	• Develop/update roadway sections and signal standards • Develop wireless traffic signal interconnections
COMPASS	• Prepare I-84 Corridor Operations Plan • Facilitate virtual traffic management strategy

The remainder of this section provides objectives and strategies for continuing the region's ITS and TSMO progress, leading up to the full deployment of implementation plan projects.

Promote Ongoing Regional Coordination

The ROWG was re-convened to serve as the steering committee for the Treasure Valley TSMO Strategic Plan update. This group consists of a cross-section of federal, state, regional, county, and local agencies involved in all aspects of transportation operations and emergency management across the two-county region. The group is voluntary and depends on the willing participation of individual agencies, as well as a minimal level of funding to allow COMPASS to facilitate ROWG meetings.

At a minimum, quarterly meetings of the ROWG are advised to promote the regional coordination required to implement many aspects of the regional TSMO vision and implementation plan.

Following TSMO Strategic Plan adoption, the ROWG can continue to support implementation through a work plan consisting of activities such as the following:

- Providing a forum for updates (projects, personnel, initiatives) by each agency
- Providing a forum for discussing regional operational needs and concerns (e.g., incident debriefs)
- Sharing funding needs and opportunities and coordinating multi-agency funding applications
- Providing a forum for agency/project presentations, information sharing, and site visits
- Coordinating annual updates to the TSMO Implementation Plan project list
- Coordinating project implementation activities among involved agencies
- Providing a forum for discussing training needs and coordinating training sessions
- Coordinating updates to the Regional ITS Inventory
- Coordinating updates to the Regional ITS Architecture
- Inviting vendors and others to provide informational presentations
- Organizing TSMO advocacy/awareness efforts

Maintain an Updated TSMO Deployment Plan and ITS Inventory

Because transportation technology rapidly changes, and agency priorities and needs also shift over time, it is advisable to update the TSMO Implementation Plan project list and the regional ITS inventory on a regular basis (preferably at least annually, as COMPASS plans to do).

The TSMO Deployment Plan review would include:

- Noting projects that have been completed or are funded and underway.
- Updating planned projects to funded status, if relevant.
- Updating the deployment timeframe, if relevant.
- Adding new projects or modifying existing projects to reflect new priorities or needs.
- Reflecting on new regional transportation needs or issues, and how TSMO could help to address those needs (e.g., an upcoming large-scale construction project or roadway expansion)
- Eliminating or reformulating projects that are no longer of interest or relevance.
- Identifying projects that may be candidates for known upcoming funding sources; adjust scope, agency participation, project extents, etc. if advantageous.

These activities could be incorporated into the recurring work plan for the ROWG, or alternatively through direct coordination between COMPASS and TSMO agency staff.

Build Regional TSMO Capacity

Successful TSMO programs rely upon investment in people, plans, and policies, not just the enabling ITS and communications technologies. In the Treasure Valley, there is an opportunity and a need to grow regional TSMO capacity in terms of staff training, coordinated regional policies, and other elements of a mature operations program.

The USDOT Capability Maturity Model (CMM) allows for self-assessment of agencies and regional programs against a set of criteria that define the maturity of a regional operations program. For example, an agency that relies upon individual "champions" for TSMO, rather than senior officials with formalized responsibilities on par with other agency programs, would be considered less mature.

There are numerous opportunities to advance the maturity of the Treasure Valley's TSMO program in accordance with the six dimensions of the CMM as shown in Table 10. The capability levels are defined as:

- Level 1: Ad-hoc, low-level of capability
- Level 2: Managed, medium level of capability
- Level 3: Integrated, high level of capability
- Level 4: Optimized, highest level of capability

Table 10: Growth of Treasure Valley Regional TSMO Program using the FHWA Capability Maturity Model (CMM)

Capability Maturity Model (CMM) Six Dimensions	Opportunity for Maturation of Treasure Valley TSMO Program
Business Processes - including formal scoping, planning, programming, and budgeting	Regional program integrated into jurisdictions' overall multimodal transportation plans with related staged program (Level 3)
Systems and Technology - including use of systems engineering, systems architecture standards, interoperability, and standardization	Systems and technology standardized and integrated on a regional basis (including arterial focus) with other related processes and training as appropriate (Level 3)
Performance Measurement - including measures definition, data acquisition, and data utilization	Output data used directly for after-action debriefings and improvements; data easily available and dashboarded (Level 2)
Culture - including technical understanding, leadership, outreach, and program legal authority	Jurisdictions' senior management understands TSMO business case and educates decision makers/public (Level 2)
Organization and Workforce - including programmatic status, organizational structure, staff development, and recruitment and retention	TSMO-specific organizational concept developed within and among jurisdictions with core capacity needs identified; collaboration takes place (Level 2)
Collaboration - including relationships with public safety agencies, local governments, MPOs, and the private sector	Rationalization/sharing/formalization of responsibilities among key players through co-training, formal agreements, and incentives (Level 3)

Sustain TSMO Assets and Programs

Unlike the initial years of ITS build-out in the 1990s and 2000s, there is an increasing need to dedicate resources and investments to replace, update, and maintain existing TSMO assets in the Treasure Valley.

The lifespan of most ITS devices and technology components, such as CCTV cameras, DMS, control room equipment, and software, is 5-15 years (versus 50 years for a bridge). Therefore, many first- and second-generation ITS and communications devices in the region will come due for replacement within the lifespan of this plan.

In the Treasure Valley, there is a need to raise awareness of the investments needed to sustain current TSMO capabilities, such as replacing field ITS systems, staffing existing operations centers, and updating regional operations plans.

Stakeholder agencies may benefit from tracking the lifecycle of ITS assets, similar to programs for monitoring bridges or pavement condition. Factual information about equipment replacement needs, and the maintenance backlog that will grow if not funded, may help to raise awareness of investment needs.

Similar calculations can be used to show the personnel levels required to continue to effectively staff operations programs and to maintain assets in proper condition.

Because TSMO strategies depend on these investments, failure to provide adequate resources will ultimately compromise the region's ability to provide critical TSMO services such as incident management and traffic signal coordination.

On the positive side, advances in technology will allow agencies to consider retirement, as opposed to replacement, of certain ITS assets. For example, ITD Headquarters is planning to retire HAR transmitters that have largely been replaced by consumer and mobile traveler information systems. Similar examples may be true in the future as increasingly connected vehicles reduce the utility of DMS located along the roadway.

Continue Strategic and Measured TSMO Infrastructure Expansion

While there are many existing TSMO assets and programs to be maintained, portions of the region are still experiencing significant population and economic growth, creating a need to expand the existing footprint of TSMO programs and support additional ITS and communications infrastructure.

A prime example is the City of Nampa, whose population has nearly doubled since 2010[5], placing additional stresses on the transportation system. The city is currently lacking ITS infrastructure (TMC, communications, regional interconnects) to effectively manage its network. This is reflected in the project list, where new corridor projects and ITS investments are concentrated in rapidly-growing cities and corridors.

Across the Treasure Valley, a key message from stakeholder agencies was the need to invest in a strategic and sustainable way when future ITS projects are considered. Most agencies face constrained budgets and competing demands, and TSMO projects are somewhat unique with a lifecycle cost structure that requires commitment to ongoing O&M and technology renewal budgets.

[5] Idaho Statesman, https://www.idahostatesman.com/news/local/community/canyon-county/article229559554.html, accessed November 27, 2019

Strategies to help focus TSMO investment in high-impact locations at a sustainable level include:

- Prioritizing investments at locations that have been objectively identified as high need (e.g., highly-congested locations with measured degradation in travel time reliability).
- Identifying implementation strategies that can be coordinated with other capital projects to reduce construction costs.
- Calculating the ongoing O&M cost (staff, maintenance, software licensing, training, etc.) of the proposed investment.
- Considering the timing and cost of technology equipment replacement in the future (likely in 5-10 years post-implementation).
- Leveraging regional partnerships to reduce project costs (e.g., sharing trained technicians across agencies).

Fund TSMO Capital and Operations Investments

Currently, a dedicated funding source for ITS infrastructure, or recurring TSMO operations and maintenance costs, does not exist. However, a few dedicated ITS project discretionary grant sources have become recently available to help further ITS deployment programs.

Funding of TSMO programs requires awareness of regional operations needs and the benefits of a coordinated TSMO program among policy makers responsible for disbursing transportation funding. TSMO projects can complement conventional capital expansion projects and can also provide “stopgap” measures in the interim period before capital projects can be implemented. TSMO approaches may even defer the need for expensive capital investments.

TSMO agencies should build awareness and partnerships with project proponents who are working to address various transportation needs in the region. For example, use of signal coordination could improve operations in a corridor that is constrained from further expansion due to cost or lack of right-of-way. Alternatively, inclusion of TSMO elements such as communications and CCTV may improve the scoring of a project in competition for regional funding.

The emergence of new technology areas including mobility on demand, smart cities, and connected/autonomous vehicles may open up new paths to funding. As when ITS was an emerging technology, there is likely to be dedicated federal funding support to incubate today’s emerging technologies, which can directly support TSMO. Agencies should monitor USDOT Notice of Funding Opportunities and reach out to their regional FTA and FHWA points of contact for help in determining funding eligibility. Additionally, COMPASS’ Resource Development Team provides support to its member agencies with grants.

Agencies will benefit by maintaining ongoing regional coordination to identify and respond to discretionary grant opportunities, many of which reward technological innovation and/or multi-agency and multi-modal approaches. This topic should be included in future ROWG agendas.

Drive Awareness of Needs and Benefits

The relatively low cost and near-term implementation timeframe for TSMO improvements are attractive in a constrained funding environment, but require effort on the part of TSMO agencies to raise awareness of TSMO benefits among policy makers. TSMO is aligned with the Treasure Valley’s regional transportation vision and is reflected in CIM 2040 2.0.

Strategies that the ROWG may employ to raise TSMO awareness include:

- Briefings for policy makers on the Regional TSMO Strategy
- Presentations to professional organizations and project proponents
- Before/after studies quantifying the benefits of TSMO programs or improvements (potentially using increasingly available operations data)
- Tours and site visits to transportation/emergency management centers
- Fact sheets on regional TSMO benefits (annual report, project fact sheets, etc.)

Continue Openness to Emerging Technologies

A fact of life for transportation agencies across the U.S. is the growing awareness of the potential transformative impact of emerging technologies such as connected and autonomous vehicles and new business models such as MaaS.

There continues to be a chicken-and-egg challenge at the local level of how to “future proof” transportation systems, and transportation technologies specifically, to account for these changes. The ground rules for many emerging technologies are still being written by (sometimes competing) coalitions of public and private-sector actors.

For example, what (if anything) should a local agency consider today when replacing a traffic signal controller to accommodate connected vehicles in the future? How should a transit agency invest in trip planning or fare payment tools, knowing that TNCs or bike share may be necessary to help customers complete the last mile?

There are more questions than answers at the current time, though it seems likely that upon retrospect many transformative transportation changes will become commonplace over the ten-year life of the TSMO Strategic Plan.

The Treasure Valley can continue its success in harnessing the opportunities (and managing the challenges) of emerging technologies by:

- Maintaining openness toward emerging technologies and new transportation market entrants, while still making decisions based on regional transportation policy principles (equity, sustainability, safety, etc.).
- Looking for appropriate angles on regional transportation needs to pursue new public/private partnerships and funding opportunities geared toward emerging technologies.
- Following emerging industry and national technical standards to guide specific local agency investments.
- Adopting open data and systems standards that are adaptable to multiple technology platforms, vendors, etc., when possible.
- Maintaining a dialogue among interested local agencies, as well as peers in other metropolitan areas facing similar issues.

Appendix A – Existing and Planned ITS Architecture Service Packages

National ITS Architecture 7.1 Service Package		ARC-IT 8.3 Service Package		Existing ITS Architecture	Next Architecture Update
Short Name	Name	Short Name	Name		
CVO01	Carrier Operations and Fleet Management	CVO01	Carrier Operations and Fleet Management	☐	☐
CVO09	CVO Fleet Maintenance	CVO01	Carrier Operations and Fleet Management	☐	☐
CVO02	Freight Administration	CVO02	Freight Administration	☐	☐
CVO03	Electronic Clearance	CVO03	Electronic Clearance	☐	☐
CVO06	Weigh-In-Motion	CVO03	Electronic Clearance	☐	☐
CVO04	CV Administrative Processes	CVO04	CV Administrative Processes	☐	☐
CVO05	International Border Electronic Clearance	CVO05	International Border Electronic Clearance	☐	☐
		CVO06	Freight Signal Priority	☐	☑
CVO07	Roadside CVO Safety	CVO07	Roadside CVO Safety	☐	☐
CVO08	On-board CVO Safety	CVO07	Roadside CVO Safety	☐	☐
CVO06	Weigh-In-Motion	CVO08	Smart Roadside and Virtual WIM	☐	☐
CVO08	On-board CVO Safety	CVO08	Smart Roadside and Virtual WIM	☐	☐
CVO10	HAZMAT Management	CVO12	HAZMAT Management	☐	☐
CVO11	Roadside HAZMAT Security Detection and Mitigation	CVO13	Roadside HAZMAT Security Detection and Mitigation	☐	☐
CVO12	CV Driver Security Authentication	CVO14	CV Driver Security Authentication	☐	☐
CVO13	Freight Assignment Tracking	CVO15	Fleet and Freight Security	☐	☐
		CVO16	Electronic Work Diaries	☐	☐
		CVO17	Intelligent Access Program	☐	☐
		CVO18	Intelligent Access Program - Weight Monitoring	☐	☐
		CVO19	Interlligent Speed Compliance	☐	☐
AD1	ITS Data Mart	DM01	ITS Data Warehouse	☑	☐
AD2	ITS Data Warehouse	DM01	ITS Data Warehouse	☑	☐
AD3	ITS Virtual Data Warehouse	DM01	ITS Data Warehouse	☑	☐
		DM02	Performance Monitoring	☐	☑
MC01	Maintenance and Construction Vehicle and Equipmen	MC01	Maintenance and Construction Vehicle and Equipment Tracking	☑	☐
MC02	Maintenance and Construction Vehicle Maintenance	MC02	Maintenance and Construction Vehicle Maintenance	☐	☐
MC05	Roadway Automated Treatment	MC03	Roadway Automated Treatment	☐	☐
MC06	Winter Maintenance	MC04	Winter Maintenance	☑	☐
MC07	Roadway Maintenance and Construction	MC05	Roadway Maintenance and Construction	☑	☐
MC08	Work Zone Management	MC06	Work Zone Management	☑	☐
AVSS12	Cooperative Vehicle Safety Systems	MC07	Work Zone Safety Monitoring	☐	☐
MC09	Work Zone Safety Monitoring	MC07	Work Zone Safety Monitoring	☐	☐
MC10	Maintenance and Construction Activity Coordination	MC08	Maintenance and Construction Activity Coordination	☑	☐
MC12	Infrastructure Monitoring	MC09	Infrastructure Monitoring	☐	☑
ATMS16	Parking Facility Management	PM01	Parking Space Management	☑	☐
		PM02	Smart Park and Ride System	☐	☐
ATMS16	Parking Facility Management	PM03	Parking Electronic Payment	☑	☐
ATMS17	Regional Parking Management	PM04	Regional Parking Management	☑	☐
		PM05	Parking Reservations	☐	☐
		PM06	Loading Zone Management	☐	☐
EM01	Emergency Call-Taking and Dispatch	PS01	Emergency Call-Taking and Dispatch	☑	☐
EM02	Emergency Routing	PS01	Emergency Call-Taking and Dispatch	☑	☐
ATMS08	Traffic Incident Management System	PS02	Emergency Response	☑	☐
EM02	Emergency Routing	PS03	Emergency Vehicle Preemption	☑	☐
EM03	Mayday and Alarms Support	PS04	Mayday Notification	☑	☐
AVSS12	Cooperative Vehicle Safety Systems	PS05	Vehicle Emergency Response	☐	☐
		PS06	Incident Scene Pre-Arrival Staging Guidance for Emergency Responders	☐	☑
		PS07	Incident Scene Safety Monitoring	☐	☑
EM04	Roadway Service Patrols	PS08	Roadway Service Patrols	☑	☐
EM05	Transportation Infrastructure Protection	PS09	Transportation Infrastructure Protection	☐	☐
EM06	Wide-Area Alert	PS10	Wide-Area Alert	☑	☐
EM07	Early Warning System	PS11	Early Warning System	☐	☐
EM08	Disaster Response and Recovery	PS12	Disaster Response and Recovery	☑	☐
EM09	Evacuation and Reentry Management	PS13	Evacuation and Reentry Management	☑	☐
EM10	Disaster Traveler Information	PS14	Disaster Traveler Information	☑	☐
APTS01	Transit Vehicle Tracking	PT01	Transit Vehicle Tracking	☑	☐
APTS02	Transit Fixed-Route Operations	PT02	Transit Fixed-Route Operations	☑	☐
APTS03	Demand Response Transit Operations	PT03	Dynamic Transit Operations	☑	☐
APTS04	Transit Fare Collection Management	PT04	Transit Fare Collection Management	☑	☐
APTS05	Transit Security	PT05	Transit Security	☑	☐
APTS06	Transit Fleet Management	PT06	Transit Fleet Management	☑	☐
APTS10	Transit Passenger Counting	PT07	Transit Passenger Counting	☑	☐
APTS08	Transit Traveler Information	PT08	Transit Traveler Information	☑	☐
APTS09	Transit Signal Priority	PT09	Transit Signal Priority	☑	☐
		PT10	Intermittent Bus Lanes	☐	☐
		PT11	Transit Pedestrian Indication	☐	☑
		PT12	Transit Vehicle at Station/Stop Warnings	☐	☑
		PT13	Vehicle Turning Right in Front of a Transit Vehicle	☐	☐
APTS07	Multi-modal Coordination	PT14	Multi-modal Coordination	☑	☐

National ITS Architecture 7.1 Service Package		ARC-IT 8.3 Service Package		Existing ITS Architecture	Next Architecture Update
APTS11	Multimodal Connection Protection	PT17	Transit Connection Protection	☑	☐
ATMS10	Electronic Toll Collection	PT18	Integrated Multi-Modal Electronic Payment	☐	☑
ATMS25	VMT Road User Payment	PT18	Integrated Multi-Modal Electronic Payment	☐	☐
ATMS11	Emissions Monitoring and Management	ST01	Emissions Monitoring	☐	☐
		ST02	Eco-Traffic Signal Timing	☐	☐
		ST03	Eco-Traffic Metering	☐	☐
ATMS12	Roadside Lighting System Control	ST04	Roadside Lighting	☑	☐
		ST05	Electric Charging Stations Management	☐	☑
ATMS05	HOV Lane Management	ST06	HOV/HOT Lane Management	☐	☐
		ST07	Eco-Lanes Management	☐	☐
		ST08	Eco-Approach and Departure at Signalized Intersections	☐	☐
		ST09	Connected Eco-Driving	☐	☐
		ST10	Low Emissions Zone Management	☐	☐
		SU01	Connected Vehicle System Monitoring and Management	☐	☑
		SU02	Core Authorization	☐	☐
ATIS06	Transportation Operations Data Sharing	SU03	Data Distribution	☑	☐
		SU04	Map Management	☐	☐
		SU05	Location and Time	☐	☐
		SU06	Object Registration and Discovery	☐	☐
		SU07	ITS Communications	☐	☑
		SU08	Security and Credentials Management	☐	☐
		SU09	Device Certification and Enrollment	☐	☐
		SU10	Center Maintenance	☐	☐
		SU11	Field Equipment Maintenance	☐	☑
		SU12	Vehicle Maintenance	☐	☑
		SU13	Personal Device Maintenance	☐	☐
ATIS01	Broadcast Traveler Information	TI01	Broadcast Traveler Information	☑	☐
ATIS10	Short Range Communications Traveler Information	TI01	Broadcast Traveler Information	☑	☐
ATIS02	Interactive Traveler Information	TI02	Personalized Traveler Information	☑	☐
ATIS03	Autonomous Route Guidance	TI03	Dynamic Route Guidance	☐	☑
ATIS04	Dynamic Route Guidance	TI03	Dynamic Route Guidance	☐	☐
ATIS05	ISP Based Trip Planning and Route Guidance	TI04	Infrastructure-Provided Trip Planning and Route Guidance	☑	☐
ATIS07	Travel Services Information and Reservation	TI05	Travel Services Information and Reservation	☑	☐
ATIS08	Dynamic Ridesharing	TI06	Dynamic Ridesharing and Shared Use Transportation	☐	☐
ATIS09	In Vehicle Signing	TI07	In-Vehicle Signage	☐	☐
ATMS01	Network Surveillance	TM01	Infrastructure-Based Traffic Surveillance	☑	☐
ATMS02	Traffic Probe Surveillance	TM02	Vehicle-Based Traffic Surveillance	☑	☐
ATMS03	Traffic Signal Control	TM03	Traffic Signal Control	☑	☐
		TM04	Connected Vehicle Traffic Signal System	☐	☑
ATMS04	Traffic Metering	TM05	Traffic Metering	☑	☐
ATMS06	Traffic Information Dissemination	TM06	Traffic Information Dissemination	☑	☐
ATMS07	Regional Traffic Management	TM07	Regional Traffic Management	☑	☐
ATMS08	Traffic Incident Management System	TM08	Traffic Incident Management System	☑	☐
ATMS09	Transportation Decision Support and Demand Manage	TM09	Integrated Decision Support and Demand Management	☑	☐
ATMS10	Electronic Toll Collection	TM10	Electronic Toll Collection	☐	☐
ATMS25	VMT Road User Payment	TM11	Road Use Charging	☐	☐
ATMS24	Dynamic Roadway Warning	TM12	Dynamic Roadway Warning	☑	☐
ATMS13	Standard Railroad Grade Crossing	TM13	Standard Railroad Grade Crossing	☑	☐
ATMS14	Advanced Railroad Grade Crossing	TM14	Advanced Railroad Grade Crossing	☐	☐
ATMS15	Railroad Operations Coordination	TM15	Railroad Operations Coordination	☐	☐
ATMS18	Reversible Lane Management	TM16	Reversible Lane Management	☐	☐
ATMS19	Speed Warning and Enforcement	TM17	Speed Warning and Enforcement	☑	☐
ATMS20	Drawbridge Management	TM18	Drawbridge Management	☐	☐
ATMS21	Roadway Closure Management	TM19	Roadway Closure Management	☐	☐
ATMS22	Variable Speed Limits	TM20	Variable Speed Limits	☑	☐
		TM21	Speed Harmonization	☐	☐
ATMS23	Dynamic Lane Management and Shoulder Use	TM22	Dynamic Lane Management and Shoulder Use	☑	☐
		TM23	Border Management Systems	☐	☐
AVSS01	Vehicle Safety Monitoring	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS02	Driver Safety Monitoring	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS03	Longitudinal Safety Warning	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS04	Lateral Safety Warning	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS06	Pre-Crash Restraint Deployment	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS07	Driver Visibility Improvement	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS09	Advanced Vehicle Lateral Control	VS01	Autonomous Vehicle Safety Systems	☐	☐
AVSS06	Pre-Crash Restraint Deployment	VS02	V2V Basic Safety	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS02	V2V Basic Safety	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS03	Situational Awareness	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS04	V2V Special Vehicle Alert	☐	☐
EM02	Emergency Routing	VS04	V2V Special Vehicle Alert	☐	☐
ATIS09	In Vehicle Signing	VS05	Curve Speed Warning	☐	☐

National ITS Architecture 7.1 Service Package		ARC-IT 8.3 Service Package		Existing ITS Architecture	Next Architecture Update
AVSS12	Cooperative Vehicle Safety Systems	VS05	Curve Speed Warning	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS06	Stop Sign Gap Assist	☐	☐
		VS07	Road Weather Motorist Alert and Warning	☐	☐
		VS08	Queue Warning	☐	☐
ATIS09	In Vehicle Signing	VS09	Reduced Speed Zone Warning / Lane Closure	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS09	Reduced Speed Zone Warning / Lane Closure	☐	☐
ATIS09	In Vehicle Signing	VS10	Restricted Lane Warnings	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS10	Restricted Lane Warnings	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS11	Oversize Vehicle Warning	☐	☐
ATMS26	Mixed Use Warning Systems	VS12	Pedestrian and Cyclist Safety	☑	☐
AVSS05	Intersection Safety Warning	VS13	Intersection Safety Warning and Collision Avoidance	☐	☐
AVSS12	Cooperative Vehicle Safety Systems	VS13	Intersection Safety Warning and Collision Avoidance	☐	☐
AVSS08	Advanced Vehicle Longitudinal Control	VS14	Cooperative Adaptive Cruise Control	☐	☐
AVSS10	Intersection Collision Avoidance	VS15	Infrastructure Enhanced Cooperative Adaptive Cruise Control	☐	☐
AVSS11	Automated Vehicle Operations	VS16	Automated Vehicle Operations	☐	☐
		VS17	Traffic Code Dissemination	☐	☐
MC03	Road Weather Data Collection	WX01	Weather Data Collection	☑	☐
MC11	Environmental Probe Surveillance	WX01	Weather Data Collection	☑	☐
MC04	Weather Information Processing and Distribution	WX02	Weather Information Processing and Distribution	☑	☐
AVSS12	Cooperative Vehicle Safety Systems	WX03	Spot Weather Impact Warning	☐	☐

Appendix B – ITS Architecture Stakeholders

Stakeholder	Existing	Planned
Ada County Highway District	☑	☐
Archived Data Users	☑	☐
Boise Airport	☑	☐
Boise State University	☑	☐
Canyon County	☑	☐
Capital City Development Corporation	☑	☐
City of Boise	☑	☐
City of Caldwell	☑	☐
City of Eagle	☑	☐
City of Garden City	☑	☐
City of Kuna	☑	☐
City of Meridian	☑	☐
City of Middleton	☑	☐
City of Nampa	☑	☐
City of Star	☑	☐
Community Planning Association	☑	☐
County and Municipal Maintenance and Construction	☑	☐
County and Municipal Public Safety Departments	☑	☐
County and Municipal Traveler Information	☑	☐
Federal Highway Administration	☑	☐
Financial Institution	☑	☐
Google	☑	☐
Idaho Bureau of Homeland Security	☑	☐
Idaho Department of Health and Welfare	☑	☐
Idaho State Police	☑	☐
Idaho Statewide Interoperability Executive Council and Idaho District 3 Interoperability Governance Board	☑	☐
Idaho Transportation Department - District 3	☑	☐
Idaho Transportation Department - Headquarters	☑	☐
Mayday Service Providers	☑	☐
Media	☑	☐
Nampa Highway District	☐	☑
Nampa Police Department	☑	☐
National Weather Service	☑	☐
Oregon Department of Transportation	☑	☐
Other Even Managers	☑	☐
Other Public Transportation Providers	☑	☐
Private Transportation Providers	☑	☐
Private Utilities	☑	☐
Regional Emergency Management	☑	☐
Regional Radio Communications Consortium	☑	☐
Third-Party Transportation Data Providers	☑	☐
Third-Party Transportation Information Service Providers	☑	☐
Travelers	☑	☐
Treasure Valley Fare Management Agencies	☑	☐
Treasure Valley Transit	☑	☐
Treasure Valley Transit Management Agencies	☑	☐
Treasure Valley Transportation Management Agencies	☑	☐
University of Idaho	☑	☐
Valley Regional Transit	☑	☐

Appendix C – ITS Architecture Inventory

Inventory Element	Existing	Planned
Ada County Highway District Commuteride Ridesharing System	☑	☐
Ada County Highway District Commuteride Vehicles	☑	☐
Ada County Highway District Field Equipment	☑	☐
Ada County Highway District Traffic Management Center	☑	☐
Agency Data Mart	☑	☐
Archived Data User Systems	☑	☐
Boise Airport Field Equipment	☑	☐
Boise Airport Management Center	☑	☐
Boise Airport Parking Management	☑	☐
Boise Airport Traveler Information System	☑	☐
Boise Parking Management	☑	☐
Boise State University Shuttle Buses	☑	☐
Boise State University Traffic Management Centers	☑	☐
Caldwell Field Equipment	☑	☐
Caldwell Traffic Management Center	☐	☑
Caldwell Traffic Signal Lab	☑	☐
Canyon County District Offices	☑	☐
Canyon County Field Equipment	☑	☐
Capital City Development Corporation Parking Management	☑	☐
CommuterRide Vanpool System	☑	☐
County 911 Centers	☑	☐
County and Municipal Maintenance and Construction Shops	☑	☐
County and Municipal Maintenance and Construction Vehicles	☑	☐
County and Municipal Public Safety Dispatch Centers	☑	☐
County and Municipal Public Safety Vehicles	☑	☐
County and Municipal Traveler Information Systems	☑	☐
Emergency Operations Centers	☑	☐
Financial Institution	☑	☐
Google Transit	☑	☐
GoRide System	☑	☐
Gowen Field State Emergency Operations Center	☑	☐
Idaho - Transportation Reimbursement, Integration, and Performance System	☑	☐
Idaho 511/Web Service	☑	☐
Idaho State Police Regional Communications Center South	☑	☐
Idaho State Police Vehicles	☑	☐
Idaho Transportation Department District 3 Maintenance Shop	☑	☐
Idaho Transportation Department Field Equipment	☑	☐
Idaho Transportation Department Incident Response Vehicles	☑	☐
Idaho Transportation Department Maintenance and Construction Vehicles	☑	☐
Mayday Service Centers	☑	☐
Media	☑	☐
Nampa Field Equipment	☑	☐
Nampa Highway District Field Equipment	☐	☑
Nampa Traffic Management Center	☐	☑
Nampa Traffic Signal Shop	☑	☐
National Weather Service	☑	☐
Oregon Department of Transportation Region 5 District Offices	☑	☐
Other Event Management	☑	☐
Other Public Transportation Dispatch Centers	☑	☐
Other Public Transportation Vehicles	☑	☐

Inventory Element	Existing	Planned
Personal Information Devices	☑	☐
Personal Vehicles	☑	☐
Private Transportation Provider Dispatch Centers	☑	☐
Private Transportation Provider Vehicles	☑	☐
Private Utilities	☑	☐
Regional Virtual TMC	☐	☑
Regional Fare Payment Card	☑	☐
Regional Fare Payment System	☑	☐
State EMS Communications Center (StateComm)	☑	☐
Third-Party Transportation Data Providers	☑	☐
Third-Party Transportation Information Service Providers	☑	☐
Travelers	☑	☐
Treasure Valley Regional Communications Inventory and Asset Management System	☑	☐
Treasure Valley Regional Maintenance and Construction Event Clearinghouse	☑	☐
Treasure Valley Regional Transportation Data Archive	☑	☐
Treasure Valley Regional Virtual Transportation Management Center	☑	☐
Treasure Valley Transit Dispatch Center	☑	☐
Treasure Valley Transit Fare Payment System	☑	☐
Treasure Valley Transit Security Systems	☑	☐
Treasure Valley Transit Traveler Security Systems	☑	☐
Treasure Valley Transit Traveler Information System	☑	☐
Treasure Valley Transit Vehicles	☑	☐
Valley Regional Transit Asset Management System	☑	☐
Valley Regional Transit Bike Share Management System	☑	☐
Valley Regional Transit Dispatch and Call Centers	☑	☐
Valley Regional Transit Transit Facilities	☑	☐
Valley Regional Transit Fare Payment System	☑	☐
Valley Regional Transit Security Systems	☑	☐
Valley Regional Transit Traveler Information Systems	☑	☐
Valley Regional Transit Vehicles	☑	☐

Appendix D – TSMO Implementation Plan Project List

ID Number	Operational Services Categories	Project Name	Lead Agency	Other Stakeholders	Year/Timeframe	Planning Level Cost Estimate ($K)	Project Description
AM-01	Arterial Management	Ada County Arterial closed-circuit television (CCTV) Camera Installation	ACHD		Annual	$50	Install 10 CCTV cameras per year on ACHD arterial roadways.
AM-02	Arterial Management	ACHD Signal Timing Updates - Near Term	ACHD		Near Term	$215	Update signal timings on Eagle Rd
AM-03	Arterial Management	Three Cities River Crossing ITS Deployment	ACHD		Near Term	$3,800	This project is defined by a parallelogram of Glenwood St, SH 44 (State St), SH 55 (Eagle Rd), and US 20/26 (Chinden Blvd). Install fiber optic communications and conduit, speed detection devices, travel time monitoring, CCTV cameras at key signalized intersections, and SPM traffic signal systems at 20 key intersections.
AM-04	Arterial Management	Arterial Management Regional Concept for Transportation Operations (RCTO-AM)	ACHD/ITD D3/City of Nampa/City of Caldwell/ITD HQ		Near Term	$125	Develops a regional strategy for integrated operations and maintenance of signalized arterials in the region. Identifies operational goals, strategies, performance measures, and agency roles and responsibilities. Identifies operational/technology strategies for key corridors with multiple operating agencies and/or technology platforms (e.g. technology vs. policy-based coordination). Develop coordination and operational strategies for joint ITD/local agency operated signal corridors. Identifies candidate locations for future Integrated Corridor Management, detour route coordination, and/or arterial travel time information.
AM-05	Arterial Management	ACHD Signal Timing Updates - Medium Term	ACHD		Medium Term	$200	Update signal timings on Cole Rd/Overland Rd, Boise Towne Square Mall area, Franklin Rd, Ustick Rd, and Fairview Ave.
AM-06	Arterial Management	Franklin Road Advanced Traffic Signal Performance Measures System Installation	ACHD		Medium Term	$400	Upgrade traffic signal systems to ATSPM on Franklin Rd (10 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
AM-07	Arterial Management	Eagle Road Traffic Signal Performance Measures	ITD D3		2020	$450	This project will upgrade controllers and radar detection to enable connection to a signal perfomrance measures software system. KN18833, ITS SH-55 Signal Equipment Upgrades. Project to be completed by 12/30/2020.
AM-08	Arterial Management	Boise Towne Square Mall Area Advanced Traffic Signal Performance Measures System Installation	ACHD		Medium Term	$600	Upgrade traffic signal systems to ATSPM on roadways around Boise Towne Square Mall (up to 15 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
AM-09	Arterial Management	Ada County Audible Pedestrian Signal Upgrades	ACHD		Annual	$140	Enhance pedestrian signals with audible walk indications. Upgrade up to 10 locations per year.
AM-10	Arterial Management	Pedestrian/Bicycle Crossing Enhancements	Various Agencies	Local operating agencies (i.e. ACHD, City of Caldwell, City of Nampa)	Annual (2019+)	$600	Enhance visibility of bicycle and pedestrian crossings (e.g. pushbutton-activated rectangular rapid flashing beacons). Install bike/ped count stations for crossings on arterial roadways to support planning efforts. Project assumes up to 5 improvement locations per year per jurisdiction. Bike/Ped improvements may be coordinated with adjacent transit stop improvements or needs.
AM-11	Arterial Management	ITD/Nampa/Caldwell Signal System Assessment and Integration Project	Cities of Nampa and Caldwell	ITD D3	Near Term	$50	Evaluate central signal systems to determine which system and available components meet the functionality needed by ITD and the cities. Ultimate system should support emergency vehicle preemption and transit signal priority. Consider a shared system for all three agencies.
AM-12	Arterial Management	City of Caldwell Standard Roadway Sections and Signal Standards	City of Caldwell		Near Term	$50	Develop updated standard roadway sections including ITS elements such as conduit and pull boxes to support provisioning for future ITS equipment. Develop updated standard specifications for intersection design and traffic signal equipment to accommodate future improvements.
AM-13	Arterial Management	ITS and Signal Asset Management System	ACHD		Medium Term	$200	Implements an asset management system that tracks traffic signal and ITS device maintenance (routine and unplanned) and uses life-cycle cost analysis to determine equipment life spans based on all associated costs (initial, operations, maintenance) and salvage values.
AM-14	Arterial Management	ACHD Signal Timing Updates - long term	ACHD		Long term	$200	Update signal timings on Federal Way, State St, Parkcenter Blvd, Orchard Rd, and Curtis Rd.
AM-15	Arterial Management	Wireless closed-circuit television (CCTV) Camera and Signal Interconnect (Phase 2)	ACHD		Near Term	$150	Install wireless radio links to 20 remote traffic signals, and install CCTV cameras.
AM-16	Arterial Management	Cole/Overland Road Adaptive Traffic Signal System Installation	ACHD		Medium Term	$600	Upgrade traffic signal systems to ATSPM on Cole Rd and Overland Rd area (up to 15 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.

ID Number	Operational Services Categories	Project Name	Lead Agency	Other Stakeholders	Year/Timeframe	Planning Level Cost Estimate ($K)	Project Description
AM-17	Arterial Management	Nampa-Caldwell Boulevard/Midland Boulevard Corridor Signal System and ITS Deployment	City of Nampa	ITD D3	2022	$800	Install fiber optic communications on Karcher Rd to Middleton Rd. Install fiber optic communications on Midland from Cald Blvd. to Orchard Ave. Install fiber optic communications on Karcher Rd from Old Karcher Rd. (Nampa Paving) to Northside Blvd., install detection for travel time and speed monitoring, install data collection devices within the Caldwell Blvd and Karcher Connector areas.
AM-18	Arterial Management	Orchard Avenue/Midland Boulevard/Middleton Rd Signal Communications	City of Nampa	Nampa Highway District	2022	$500	Install fiber optic communications to traffic signals at Orchard Ave/Midland Blvd/Middleton Rd.
AM-19	Arterial Management	10th Avenue Corridor /Illinois Avenue North Signal System and ITS Deployment	City of Caldwell	ITD D3	Near Term	$480	Install fiber optic communications on 10th Ave/Illinois Ave from Blaine St to Marble Front Rd. Upgrade four traffic signal controllers. Install approximately two CCTV cameras at key intersections.
AM-20	Arterial Management	ACHD Signal Timing Updates	ACHD		Medium Term	$80	Update signal timings on Vista Ave from Rose Hill St - Wright St.
AM-21	Arterial Management	ACHD Signal Timing Updates	ACHD		Medium Term	$100	Update signal timings on Broadway Ave
AM-22	Arterial Management	Transit Signal Priority - Phase 2	ACHD		Medium Term	$200	Expand Phase 1 to an additional 20 traffic signals.
AM-23	Arterial Management	US 20/26 (Chinden Boulevard) ITS Deployment	ITD D3		Medium Term	$350	Install fiber optic communications and conduit on US20/26 (Chinden Blvd) from Linder Rd to Tree Farm Ln. Install speed detection and approximately two CCTV cameras.
AM-24	Arterial Management	State Highway 55 ITS Deployment	ITD D3		Long Term	$200	Install fiber optic communications and conduit on SH 55 from Beacon Light Rd to Floating Feather Rd. Install approximately two CCTV cameras.
AM-25	Arterial Management	Middleton Road Corridor Signal System and ITS Deployment	ITD D3	City of Nampa	Medium Term	$1,490	Install fiber optic communications on Nampa-Caldwell Blvd from Homedale Rd to Nampa Canyon Plaza (Winco) on Middleton Rd from Nampa-Caldwell Blvd to Roosevelt Ave. Upgrade two traffic signal controllers. Install approximately two CCTV cameras at key signalized intersections.
AM-26	Arterial Management	12th Avenue Corridor Signal System and ITS Deployment	ITD D3	City of Nampa	Medium Term	$820	Install fiber optic communications on 12th Ave from 7th St to Greenhurst Rd. Upgrade four traffic signal controllers. Install approximately three CCTV cameras at key signalized intersections.
AM-27	Arterial Management	Downtown Caldwell Signal System and ITS Deployment	ITD D3		Medium Term	$540	Install fiber optic communications on Blaine St from 5th Ave to 10th Ave, on 5th Ave from Blaine St to Main St (Caldwell Police Station), on Cleveland Blvd from 7th Ave to 10th Ave, and on 10th Ave from Blaine St to Cleveland Blvd. Upgrade six traffic signal controllers. Install approximately two CCTV cameras at key signalized intersections.
AM-28	Arterial Management	ACHD Signal Timing Updates - Downtown Boise area	ACHD		Medium Term	$150	Update signal timings in the Downtown Boise area (100 signals)
AM-29	Arterial Management	Transit Signal Priority - Phase 3	ACHD		Long Term	$200	Expand Phases 1 and 2 to an additional 20 traffic signals.
AM-30	Arterial Management	I-84/Franklin Road/Overland Road Integrated Corridor Management (ICM) Implementation	ITD D3		Near Term	$200	Implement ICM along the I-84 corridor from Garrity Blvd to the I-84/I-184 WYE interchange. Automate the detour plans currently used by ACHD to divert traffic to Franklin Rd and Overland Rd using ACHD's ATMS. Install trailblazer signs along arterials, dynamically adjust traffic signals for detour conditions, and disseminate detour-related traveler information. Disseminate travel times along all corridors during normal operating conditions.
AM-31	Arterial Management	Downtown Nampa ITS Deployment	ITD D3	City of Nampa	Near Term	$970	Fill in fiber optic communications gaps on Nampa-Caldwell Blvd/3rd St, 2nd St, Garrity Blvd, and 16th Ave. For the downtown area (bounded by Garrity Ave, 16th Ave, 7th St, and 11th Ave): Install approximately four CCTV cameras at key signalized intersections.
AM-32	Arterial Management	Amity Road Corridor Signal System and ITS Deployment	City of Nampa		2025	$800	Install fiber optic communications on Amity Ave/Colorado Ave from 12th Ave to Chestnut Rd. Upgrade one traffic signal controller. Install 6 CCTV & Surveillance cameras, detection for travel time and speed monitoring at signalized intersections between 12th Ave. and Southside Blvd.
AM-33	Arterial Management	Blaine Street/Cleveland Boulevard Corridor Signal System and ITS Deployment	ITD D3		Long Term	$590	Install fiber optic communications on Cleveland Blvd from 10th Ave to Linden St and on 21st Ave from Cleveland Blvd to Blaine St. Upgrade four traffic signal controllers. Install approximately two CCTV cameras at key intersections.
AM-34	Arterial Management	State Highway 44 ITS Deployment	ITD D3		Long Term	$275	Install fiber optic communications and conduit on SH 44 from SH 16 to Star Rd. Install approximately two CCTV cameras at key signalized intersections.

ID Number	Operational Services Categories	Project Name	Lead Agency	Other Stakeholders	Year/Timeframe	Planning Level Cost Estimate ($K)	Project Description
AM-35	Arterial Management	Garrity Boulevard/Idaho Center Boulevard Corridorand ITS Deployment	ITD D3	City of Nampa	Long Term	$870	For Garrity Blvd/Idaho Center Blvd (Kings Rd to Birch Ln/Terra Linda Way), Franklin Rd/Gate Blvd, and Happy Valley Rd (Flamingo Ave to Stamm Ln): Install approximately two CCTV cameras at key signalized intersections. Incorporate pedestrian enhancement such as pedestrian countdown timers and audible crossing signals.
AM-36	Arterial Management	Franklin Road/21st Avenue Corridor Signal System and ITS Deployment	ITD D3	City of Nampa	Long Term	$580	Install fiber optic communications on 21st Ave/Franklin Rd from Blaine St to Smeed Pkwy in the City of Caldwell. Explore wireless communications feasibility on US 20/26 between Smeed Pkwy and Middleton Rd. Upgrade seven traffic signal controllers. Install approximately four CCTV cameras at key signalized intersections.
AM-37	Arterial Management	Ustick Road ITS Deployment	ACHD		Long Term	$600	Install CCTV cameras on Ustick Rd from Ten Mile Rd to Centerpoint Way.
AM-38	Arterial Management	Northside Boulevard Corridor Signal System and ITS Deployment	ITD D3	City of Nampa	Long Term	$930	Install fiber optic communications on Northside Blvd from Cherry Ln to 1st St and on I-84 from Northside Blvd to Franklin Blvd. Upgrade six traffic signal controllers.
AM-39	Arterial Management	10th Avenue Corridor Central Signal System and ITS Deployment	ITD D3		Long Term	$690	Install fiber optic communications on 10th Ave from Cleveland Blvd to Ustick Rd. Upgrade three traffic signal controllers. Install approximately two CCTV cameras at key intersections.
AM-40	Arterial Management	Greenhurst Road Corridor Signal System and ITS Deployment	City of Nampa		Medium Term	$500	Install fiber optic communications on Greenhurst Rd from 12th Ave to Southside Blvd. Install CCTV cameras and travel time/speed monitoring at four key intersections .
AM-41	Arterial Management	I-84/Nampa-Caldwell Boulevard Integrated Corridor Management (ICM) Implementation	ITD D3		Long Term	$200	Implement ICM along the I-84 corridor from Centennial Way to Garrity Blvd. Automate the detour plans currently used by the Canyon County Sheriff's Office to divert traffic to Blaine St/Cleveland Blvd, Nampa-Caldwell Blvd, 2nd St, 11th Ave, and Garrity Blvd. Install trailblazer signs along arterials, dynamically adjust traffic signals for detour conditions, and disseminate detour-related traveler information. Disseminate travel times along all corridors during normal operating conditions.
AM-42	Arterial Management	Nampa-Caldwell Boulevard Corridor Signal System and ITS Deployment	Cities of Nampa and Caldwell		Medium Term	$1,020	Install fiber optic communications on Nampa-Caldwell Blvd from Linden St to Homedale Rd. Upgrade four traffic signal controllers. Install approximately two CCTV cameras at key signalized intersections.
AM-43	Arterial Management	State Highway 55 (Karcher Road) Signal System and ITS Deployment	ITD D3		Long Term	$1,480	Install fiber optic communications and upgrade four new traffic signals on SH 55 (Karcher Rd) between 10th Ave and Nampa-Caldwell Blvd. Install CCTV camera at SH 55/Karcher Rd interchange. Install approximately two CCTV cameras at key signalized intersections.
AM-44	Arterial Management	10th Avenue Corridor South ITS Deployment (phase 1)	City of Caldwell		2025	$640	Install fiber optic communications on 10th Ave from I-84 to Ustick Rd. Install approximately one CCTV camera at a key intersection and install detection for travel time and speed monitoring.
AM-45	Arterial Management	Maple Grove Road ITS Deployment	ACHD		Long Term	$400	Install fiber optic communications and conduit on Maple Grove Rd from Overland Rd to Amity Rd. Install approximately two CCTV cameras.
AM-46	Arterial Management	Eagle Road Advanced Traffic Signal Performance Measures System Installation	ACHD/ITD		2020	$600	Upgrade traffic signal systems to ATSPM on Eagle Rd (16 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
AM-47	Arterial Management	Fairview Avenue Advanced Traffic Signal Performance Measures System Installation	ACHD		Medium Term	$300	Upgrade traffic signal systems to ATSPM on Fairview Ave. (up to 10 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
AM-48	Arterial Management	Ustick Road Advanced Traffic Signal Performance Measures System Installation	ACHD		Long Term	$375	Upgrade traffic signal systems to ATSPM on Ustick Rd. (8 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
AM-49	Arterial Management	State Street Advanced Traffic Signal Performance Measures System Installation	ACHD		Long Term	$600	Upgrade traffic signal systems to ATSPM on State St. east of Glenwood (up to 15 signals). Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
AM-50	Arterial Management	Arterial Management/ITS deployment Planning	City of Caldwell		Long Term	-	Anticipate other Principle arterial corridors will need similar long term consideration to that of 10th Ave, Indiana, and Ustick.
C-01	Regional Communications Infrastructure Management	Regional Virtual Traffic Management Center (TMC) Communications/Network	ITD D3		Near Term	$200	Establish a regional interagency network to support the regional Virtual TMC. Complete communications connectivity, install networking equipment, and establish network management and security protocols for center-to-center integration of regional traffic management, video sharing, traveler information, and data archiving systems. Network will consider needs of transit and emergency management partner agencies.

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C-02	Regional Communications Infrastructure Management	Public-Private Communications Partnership	ITD D3		On going	$20	Ongoing effort to build additional partnerships with private communications companies, utilities, institutions, and other entities for cooperative deployment and management of fiber optic agreements. Project entails exploration of relationships and development of agreements with partners. This project will be closely coordinated with C-1.
C-03	Regional Communications Infrastructure Management	City of Caldwell Wireless Traffic Signal Interconnects	City of Caldwell		2020	$110	Utilize wireless communications to link the City of Caldwell field traffic control devices to the future City of Caldwell central traffic management system, to support centralized signal operations and maintenance. An existing City of Caldwell public safety wireless radio system has been identified as a potential option for implementing the wireless interconnect project, subject to further engineering feasibility assessment.
C-04	Regional Communications Infrastructure Management	City of Caldwell Field-to-Center Fiber Optic Backbone	City of Caldwell		Long Term	$200	Provide fiber optic backhaul between the future City of Caldwell central traffic management system and field signals/CCTV infrastructure. Also provides connectivity to the regional fiber optic network and virtual TMC via the I-84 fiber optic backbone. Note that while fiber optic infrastructure may be deployed incrementally over time, the deployment of high bandwidth ITS devices such as streaming video will be a key driver for fiber integration. Consider implementing in conjunction with Project AM-53.
C-05	Regional Communications Infrastructure Management	Nampa Fiber Optic Loop	City of Nampa		2020+	$400	Provide fiber optic backhaul fill in outlying corridor gaps to create a redundant loop communication system.
C-06	Regional Communications Infrastructure Management	Communications Upgrade (Fiber Rings)	ITD HQ/ ITD D3/ACHD		Long Term	$500 - $1000	Upgrade existing regional fiber system to higher speed network (up to 10 Gig).
C-07	Regional Communications Infrastructure Management	Nampa Fiber Optic Loop and Signal Controller upgrade (Phase 1)	City of Nampa		2019+	$100	Extension of the fiber optic network to connect new isolated intersection improvement projects to the existing Traffic Management & Emergency Operations Center.
ES-01	Emerging Strategies	Freeway Active Traffic Management (ATM)	ITD D3		Long Term	N/A	Implementation of dynamic lane control, variable speed limits, and other ATM techniques to reduce incident impacts, improve safety, and improve travel time reliability on the urban freeway system.
ES-02	Emerging Strategies	Ustick Road Corridor ITS Deployment	City of Caldwell		Long Term	$730	Install fiber optic communications on Ustick Rd from 10th Ave to Nampa-Caldwell Blvd. Install approximately two CCTV cameras at key intersections and install detection for travel time and speed monitoring. Implement these strategies as the corridor re-develops. Fill in gaps as needed in the long term.
ES-03	Emerging Strategies	Indiana Ave Corridor ITS Deployment	City of Caldwell		Long Term	$1,300	Install fiber optic communications on Indiana Ave from Cleveland Blvd to Karcher Rd. Install approximately two CCTV cameras at key intersections and install detection for travel time and speed monitoring. Implement these strategies as the corridor re-develops. Fill in gaps as needed in the long term.
ES-04	Emerging Strategies	Kings Road Corridor Communications	City of Nampa		Long Term	$710	Install fiber optic communications on Kings Rd from Garrity Blvd to Greenhurst Rd as the corridor re-develops. Fill in gaps as needed in the long term.
ES-05	Emerging Strategies	Middleton Road Corridor Communications	City of Nampa		Long Term	$1,000	Install fiber optic communications on Middleton Ave from Greenhurst Rd. to Orchard Ave. As this corridors re-develops, fill in gaps as needed - long term resolution.
ES-06	Emerging Strategies	Lake Lowell Ave/Middleton Road Corridor Communications	City of Nampa		Long Term	$800	Install fiber optic communications on Lake Lowell Ave from Middleton Rd to 12th Ave. - Install fiber optic communications on Roosevelt Ave from Middleton Rd to Midland Rd. As these corridors re-develop, fill in gaps as needed - long term resolution.
ES-07	Emerging Strategies	Lonestar Rd/Orchard Blvd Corridor Communications	City of Nampa		Long Term	$820	Install fiber optic communications on Lonestar Rd. from Middleton Rd to Midland Blvd. Install fiber optic communications on Orchard Blvd from Middleton Rd. to Caldwell Blvd. As these corridors re-develop, fill in gaps as needed - long term resolution.
FM-01	Freeway Management	Maintain Regional Incident Response Vehicle Program	ITD D3		On going	$200	Maintain the ITD Incident Response Vehicle Program along I-84 in the urbanized areas of Ada and Canyon Counties (freeway focus). Project includes ongoing operational costs/staffing, procurement of replacement response vehicles and ongoing coordination with StateComm, ITD, and Canyon County law enforcement/emergency management agencies.
FM-02	Freeway Management	I-84 Ramp Metering Operational Study	ITD D3	Coordinate with COMPASS (RC-04)	Near Term	$100	Conduct an in-depth study of the benefits and operations of I-84 ramp metering. This effort would likely follow the outcomes of the I-84 Operational Study. The outcomes of this study would be the basis for FM-3 and FM-4 ramp metering intstallation and deployment.

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FM-03	Freeway Management	I-84 Ramp Metering Installation - Initial Deployment	ITD D3		Medium Term	$1,470	Implement freeway on-ramp metering system to reduce ramp merge area congestion, maintaining smoother traffic flow on the freeway main line. Project builds upon recommendations of previous ramp meter feasibility analysis by ITD. Three interchanges have been identified for initial deployment: Eagle Rd.; Ten Mile Rd.; and Meridian Rd. (Note: Deployment date pending ongoing initial study)
FM-04	Freeway Management	I-84/I-184 Ramp Metering Installation - Expansion	ITD D3		Long Term	N/A	Implement freeway on-ramp metering system to reduce ramp merge area congestion, maintaining smoother traffic flow on the freeway main line where appropriate and geometrics allow. Project builds upon recommendations of previous ramp meter feasibility analysis by ITD and experience from the Initial deployment.
IM-01	Incident and Emergency Management	Integrate Traffic Video into Emergency Responder Mobile Data Terminals (MDTs)	ACHD		Long Term	$200	Provides ACHD traffic video data feed to emergency responder vehicles to assist in incident response and other emergency management functions.
IM-02	Incident and Emergency Management	Emergency Responder Computer-Aided Dispatch (CAD) Integration with Traffic Management/511 Traveler Information	ITD HQ		Medium Term	$300	Develop an interface for automated exchange of emergency responder (Idaho State Police, Ada County Sheriff's Office, Canyon County Sheriff's Office) CAD data with transportation agencies, including ITD, StateComm, ACHD, and local agencies, to support incident management, ITD CARS 511/traveler information, and maintenance dispatch. System requirements will be driven in part by roles and system interfaces documented in the Regional Concept for Transportation Operations. (Note: ACHD is currently integrated with Ada County Sheriff's Office CAD system)
IM-03	Incident and Emergency Management	Idaho State Police (ISP) Integration with Regional Virtual TMC	ITD HQ		Medium Term	$50	Develop an interface between Regional Virtual TMC and systems used at the ISP Dispatch Center to support traffic management functions such as device sharing and event viewing. Install fiber interconnects/consoles to support virtual TMC.
IM-04	Incident and Emergency Management	Ada County Sheriff/Ada City-County Emergency Management (ACCEM) Integration with Regional Virtual TMC	ITD HQ		Medium Term	$50	Develop an interface between Regional Virtual TMC and systems used at the Ada County Sheriff's Office and Ada City-County Emergency Management (ACCEM), to support traffic management functions such as device sharing and event viewing. Install fiber interconnects/consoles to support virtual TMC.
IM-05	Incident and Emergency Management	Canyon County Sheriff Integration with Regional Virtual Traffic Management Center (TMC)	ITD HQ	Canyon County	Long Term	$50	Develop an interface between Regional Virtual TMC and systems used at the Canyon County Sheriff's Office , such as CCTV viewing and control. Install fiber interconnects/consoles to support virtual TMC.
IM-06	Incident and Emergency Management	Mobile Traffic Management/Incident Information for Emergency Responder Vehicles	ITD HQ		Long Term	$100	Provides real time traffic management, incident, and event information to emergency responder vehicle Mobile Data Terminals (MDTs), potentially through integration of traffic management/computer aided dispatch systems or other application.
IM-07	Incident and Emergency Management	Traffic Incident Management	ITD HQ		Near Term	-	Continue to develop Incident Management program
MC-01	Maintenance and Construction	Ada County Arterial closed-circuit television (CCTV) Camera Cleaning	ACHD		Annual	$40	Clean approximately 160 CCTV cameras on arterial roadways four times per year.
MC-02	Maintenance and Construction	ITD Interstate and State Highway ITS Device Maintenance	ITD D3/ITD HQ		Annual	$200	Clean CCTV cameras and perform maintenance and repairs for CCTV cameras, dynamic message signs, road weather information systems, and highway advisory radio on interstates and state highways. This maintenance is typically done as part of a statewide contract. The cost shown is approximate for the Treasure Valley part of the contract.
MC-03	Maintenance and Construction	Develop ITS Systems Maintenance Regional Concept for Transportation Operations (RTCO-MAINT)	ITD D3		Near term	$5	Develop a joint regional strategy for ongoing maintenance of ITS devices and infrastructure, with the objective of promoting resource sharing such as technical personnel, training activities, spare parts, and after-hours emergency on-call services. The project may result in interagency agreements to document the recommendations of the Regional Concept for Transportation Operations.
MC-04	Maintenance and Construction	ACHD Maintenance and Construction Database	ACHD		Medium Term	$100	Provides a single repository for planned maintenance and construction activity as well as scheduled events. System will be integrated into existing ACHD traffic management permitting procedures to streamline work flow. The system may be further expanded to include other regional partners and/or provide traveler information to 511 (similar to existing Canyon County system).
PT-01	Public Transportation Management	Fare collection kiosks	VRT		Near Term	$300	Expand options for passengers to purchase fixed route passes and tickets. Reduce barriers for customers to use VRT services. Evaluate the need for ticket vending machines at key locations such as Main Street Station etc.

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PT-02	Public Transportation Management	Transportation Wallet Fare Integration - Phase 1 and 2	VRT		Near Term	$500	Decrease driver involvement in mobile ticketing by eliminating the need for visual validation by the drivers. Purchase and install electronic validators (QR code readers) in all ValleyRide buses.
PT-03	Public Transportation Management	AVAIL Business Intelligence Module	VRT		Near Term	$100	Enhance the ability to extract needed information/data from FleetNet (renamed to AVAIL) to significantly improve the use of that tool and the efficiency of VRT staff to perform all business functions. Participate with AVAIL to define a new Business Intelligence (BI) module. Implement this data analytics module to improve ability to extract information and generate key reports. Additionally, VRT staff to participate in comprehensive AVAIL training on the capabilities of the former FleetNet software and new BI module.
PT-04	Public Transportation Management	Regional Transit Farecard Integration	VRT	TVT	Medium Term	$250	Develop and implement a regional interoperable farecard among transit operators and institutional pass programs in the region. Program may include transit, vanpool. Paratransit, bikeshare, and/or parking.
PT-05	Public Transportation Management	Fully integrate Mobility On Demand (MOD) smartphone application	VRT		Medium Term	$500	Integrate fare payment, trip planning and booking across multiple modes, i.e. fixed route, demand response, bike share, taxis etc. Fully integrated MOD App will build on fare collection system upgrades and allow a passenger to plan trips, purchase tickets, and take rides by multiple transportation providers in a integrated fashion. All data will be integrated. App will integrate existing mobile ticketing technology and real-time bus information.
PT-06	Public Transportation Management	Enhance Seon camera systems	VRT		Near Term	$5	Allow real-time access to bus video systems to enhance safety. Install integrated and updated software to existing fixed route bus video systems.
PT-07	Public Transportation Management	Enhanced smartphone-based schedule and service alerts	VRT		Medium Term	$125	Enhance existing 511 smartphone apps with alerts (push function) capability regarding changes to saved transit routes. Develop and implement schedule and service alerts integrated within user profiles on 511 smartphone or other apps
PT-08	Public Transportation Management	Add facility surveillance cameras	VRT		Long Term	$150	Enhance safety with on-site facility CCTV camera images and streaming. Placeholder to expand facility video surveillance, mostly in Canyon County. Some upgrades may be considered in Boise.
PT-09	Public Transportation Management	Expand on-vehicle cameras	VRT		Long Term	$150	Enhance safety with on-board CCTV camera images. Placeholder to expand on-vehicle video surveillance.
PT-10	Public Transportation Management	Fare collection system upgrades Phase 2	VRT		Long Term	$200	Remove barriers to using our services by enhancing VRTs ability to accept credit cards, pre-paid cards and cash. Upgrade facilities to accept cash and credit cards.
PT-11	Public Transportation Management	Digital Mobile Advertising	VRT		Near Term	$50	Revenue generating digital advertising on fixed route buses. Monitors and Hardware for digital advertising.
PT-12	Public Transportation Management	Real-time passenger information at key locations & facilities	VRT		Near Term	$75	Improve passenger information regarding location/status of fixed route buses. Install large message boards/signs/TVs with bus status (location, timing, etc.) by route.
PT-13	Public Transportation Management	Autonomous Vehicle Pilot Program	VRT		Medium Term	$50	Provide transit services to more people at a lower operational cost. Thereby expanding the availability of transit services to more areas and during more times of the day. Potentially providing fixed route service on demand in low ridership times of the day. Deploy accessible autonomous transit service on public roadways that is open to the general public. Coordinate with statewide Autonomous Vehicle and Connected Vehicle Committee - ITD contact, Jeff Marker.
PT-14	Public Transportation Management	Real-time passenger information at key locations - bus stops	VRT	Cities of Nampa, Boise and Meridian	Medium Term	$125	Improve passenger information regarding location/status of fixed route buses. Install large message boards/signs/TVs with bus status (location, timing, etc.) by route.
PT-15	Public Transportation Management	Scheduling sofware	VRT		Near Term	$50	Improve collaboration between planning and operations to improve on-time performance, and service cost estimates. Reduce staff time and effort in creating headway sheets/paddles, left/rights etc. Reduce operations costs by optimizing runcuts. Automate the creation of service blocks to quickly iterate potential solutions, minimize operating costs, meet labor requirements and minimize staff time. Solution should also automate the creation of headway sheets/paddles, lefts/rights and runcuts.
PT-16	Public Transportation Management	Transit signal priority - next corridor	VRT	ACHD	Medium Term	$100	Continue to improve on-time performance of fixed route bus service through TSP treatment at traffic signals within a high priority corridor. Work with ACHD to identify, fund, and install TSP system with the next high priority corridor. On-board equipment already installed.

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PT-17	Public Transportation Management	1-call/1-click customer service system	VRT		Medium Term	$200	Provide the ability to move all modes into an integrated mobility model that is seamless for the customer. Procure and implement a system that allows VRT to integrate customer service and scheduling for ALL systems in an easy and seamless manner for the customers. Gives customers one online/mobile scheduling platform for all modes.
PT-18	Public Transportation Management	Enterprise Business System	VRT		Long Term	$500	Improve business function execution efficiency, technology, and data management technology through the installation of a fully integrated enterprise system. Functions would include at the minimum financial, procurement, grants management, asset management operations, project management and maintenance management. Replace or fully update the FleetNet/AVAIL system. This could be a single fully integrated system or a group of integrated systems. Must replace all functions currently being performed by FleetNet, including the financial system.
PT-19	Public Transportation Management	Upgrade resource directory	VRT		Long Term	$50	Provide a resource directory of all providers and services in the Treasure Valley. Upgrade Resource Directory developed by M2 Consulting (we own software and domain)
PT-20	Public Transportation Management	Transit Signal Priority in Nampa	City of Nampa	VRT, ACHD, ITD	Long Term	$325	Identify opportunities to enable Transit Signal Priority as signal upgrades are performed
PT-21	Public Transportation Management	Vehicle Radio Replacement	VRT		Medium Term	$750	Current systems are old and not going to be sustainable; Would want ability for both counties to be on same frequency to allow internal communication; current analog system prevents Canyon county buses from communicating in key areas (downtown Boise); new radio systems are digital
RC-01	Regional Operations Coordination and Planning	Update/Develop Standard Specifications for ITS and Communications Infrastructure	ACHD		Near Term	$60	Each agency 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.
RC-02	Regional Operations Coordination and Planning	Update Treasure Valley Transportation Operations, Management and ITS Plan	COMPASS		Medium Term	$200	The region's ITS and operations strategic plan and ITS Architecture will be updated approximately every five years to ensure that it remains consistent with evolving needs, regional plans, and progress in ITS implementation. This effort will include a comprehensive update of the existing conditions assessment, regional ITS inventory, vision, operational concept, implementation plan, and Regional ITS Architecture.
RC-03	Regional Operations Coordination and Planning	Maintain Regional Operations Working Group	COMPASS		Medium Term	$25/year	Facilitate a regional, interagency working group to discuss 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-04	Regional Operations Coordination and Planning	I-84 Corridor Operations Plan	COMPASS/ITD D3/ ITD HQ		Near Term	$250	In cooperation with ITD D3, develop a plan to identify, analyze and prioritize potential operational strategies along the I-84 corridor to improve safety, mobility, and reliability.
RC-05	Regional Operations Coordination and Planning	Virtual Traffic Management Strategy	COMPASS		Near Term	$200	Help facilitate the transportation agencies and incident responders throughout the Treasure Valley with the development of a strategy for agencies to virtually share “traffic management-type information” and technology to effectively manage and maintain the transportation system.
RW-01	Road Weather Operations	RWIS Replacement and Deployment in Ada County	ACHD		Long Term	$680	End-of-life renewal and/or new deployment of up to ten Road Weather Information Systems (RWIS) stations in the ACHD system.
RW-02	Road Weather Operations	Integrate weather information into ACHD Traffic Management Center (TMC)	ACHD		Near Term	$400	Using the FHWA developed Weather Responsive Traffic Management (WRTM) Strategies document and the Self-Evaluation Planning Guide document, ACHD will work toward integrating weather information into their traffic operations activities.
RW-03	Road Weather Operations	Pathfinder	ITD HQ		Near Term	-	Continue to develop Pathfinder program
TI-01	Traveler Information	I-84 Dynamic Message Sign (DMS) Replacement	ITD D3		Medium to Long Term	$600	End-of-Life Replacement of existing DMS signs at Eagle Rd, Gowen Rd, and Locust Grove Rd.

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TI-02	Traveler Information	Arterial Dynamic Message Sign (DMS) Installation	ACHD		Long Term	$600	Add arterial Dynamic Message Signs at key traveler decision points on East/West Arterials and add devices to the North/South Arterials within Ada County. Can support arterial, freeway, and special event (e.g. BSU) traffic management scenarios.
TI-03	Traveler Information	ACHD & Canyon County Traffic Management Integration with ITD 511	ITD HQ		Near Term	$200	System-to-system interface to integrate Canyon County and ACHD's traffic management system event data with the ITD statewide 511 traveler information system.
TI-04	Traveler Information	Arterial Travel Time Information System	ACHD		Long Term	$300	Install travel time infrastructure (e.g. Bluetooth) arterial roadways in Ada County for dissemination of traveler information and to support future planning efforts.
TI-05	Traveler Information	Decomission of Highway Advisory Radio	ITD HQ		2020	$600	Decomissioning of HAR units and replacement where necessary with DMS or like ITS device.
TI-06	Traveler Information	WAZE Addition to 511	ITD HQ		Near Term	$50	Addition of WAZE to 511 system.
TM-01	Regional Transportation Management	"Virtual" Traffic Management Center (TMC) Regional Concept for Transportation Operations (RCTO-VTMC)	ITD D3/ITD HQ		Near Term	$100	Establishes the operating objectives, roles and responsibilities, and high level system requirements for a regional Virtual TMC connecting StateComm, ITD, ACHD, and other regional partners to provide cooperative traffic control and management capabilities. RCTO will establish high level system functional requirements based on operational/business needs, as well as ongoing equipment maintenance and funding responsibilities. The RCTO forms the basis for future interagency agreements.
TM-02	Regional Transportation Management	Regional "Virtual" Traffic Management Center (TMC) Design and Implementation	ITD D3		Medium Term	$200	Integrate the updated/new ITD Central Control Software and other agency traffic management systems to provide enhanced joint operational capabilities, as outlined in the Virtual TMC RCTO. This project forms a central foundation of the Virtual TMC system, to which other agencies will be added in the future.
TM-03	Regional Transportation Management	Nampa Arterial - Traffic Management & Emergency Operations Center System (Concept)	City of Nampa	Nampa PD	2020	$60	Develop a concept for a central traffic control/transportation and emergency operations management software system for Nampa to allow centralized traffic control, maintenance, monitoring and surveillance. The scope of Nampa's - Traffic Management & Emergency Operations Center (Concept) will determine the infrastructure, equipment, software and staffing required to implement the proposed Traffic Management & Emergency Operations Center.
TM-04	Regional Transportation Management	Nampa Arterial - Traffic Management & Emergency Operations Center Nampa Arterial Traffic Management Center and System (Phase 1) Implementation	City of Nampa	Nampa PD	Near Term	$3,500	Deploy a central traffic control/transportation and emergency operations management software system for Nampa to allow centralized traffic control, maintenance, monitoring and surveillance. The scope of Nampa's - Traffic Management & Emergency Operations Center (Phase 1) will initially include the I.C. Blvd & Garrity Blvd freight corridor and continuing into Nampa's downtown arterials.
TM-05	Regional Transportation Management	Implementation Nampa Arterial Traffic Management & Emergency Operations Center and System (Phase 2) Implementation	City of Nampa	Nampa PD	Medium Term	$2,500	Expand the limits of the Nampa Traffic Management & Emergency Operations Center to include remaining isolated system locations throughout the city.
TM-06	Regional Transportation Management	StateComm Central Systems Upgrade	ITD HQ		2020	$500	Complete upgrades and critical replacements to the StateComm video walls (ITD and ISP), as well as other central communications and networking equipment.
TM-07	Regional Transportation Management	ACHD Performance Monitoring System	ACHD		Medium Term	$200	Allows for monitoring of the County transportation system using archived historical operations data and analysis tools.
TM-08	Regional Transportation Management	ITD - D3 Traffic and Maintenance Management System Upgrade	ITD D3		Near Term	$75	Provides upgraded traffic monitoring and control capabilities to support ITD D3 incident response and maintenance dispatch capabilities, such as CCTV camera control and central traffic signal control/monitoring. Integrates ITD assets including phase 1 ITD Central Control Software, radio dispatch, traffic management control systems, and CCTV surveillance cameras into an upgraded maintenance and operations control facility at ITD District 3.
TM-09	Regional Transportation Management	StateComm - Backup Center Central Equipment	ITD HQ		Near Term	$200	Replace and upgrade central systems infrastructure at the StateComm backup control center, including a video wall and ITD radio system integration.
TM-10	Regional Transportation Management	Caldwell Arterial Traffic Management Center and System: Phase 1	City of Caldwell		Medium Term	$325	Deploy a central traffic signal/transportation management software system for the City of Caldwell to allow for centralized traffic signal control, maintenance, and monitoring capabilities. This project may be combined with other signal upgrade, interconnect, and/or fiber optic communications projects as described above to form a 'core' central traffic management system that will expand over time as additional signals and field devices are integrated.

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TM-11	Regional Transportation Management	StateComm Management Center Upgrade/ Integration with Regional Virtual Traffic Management Center (TMC)	ITD HQ		Long Term	$150	Integrate of StateComm/Treasure Valley ITS infrastructure, data flows, and operations/control capabilities with other agencies connected into the Virtual TMC. (Note: Integration with Emergency Responder Computer Aided Dispatch (CAD) is provided under a separate project under the Incident and Emergency Management section)
TM-12	Regional Transportation Management	City of Nampa Integration with Regional Virtual Traffic Management Center (TMC)	City of Nampa		Medium Term	$75	Integrate of the City of Nampa traffic management center with the virtual capabilities of the regional traffic management system. Provides workstation capabilities for the City to access regional traffic management assets, as well as integration of City field and central systems into the Virtual TMC.
TM-13	Regional Transportation Management	Caldwell Arterial Traffic Management Center and System: Phase 2	City of Caldwell		Long Term	$200	Future expansion of the Caldwell TMC to support growth in anticipated ITS and operations programs. TMC improvements may be coordinated with integration of the City with the regional Virtual TMC (listed as a separate project).
TM-14	Regional Transportation Management	City of Caldwell Integration with Regional Virtual Traffic Management Center (TMC)	City of Caldwell		Long Term	$50	Integrate of the City of Caldwell traffic management center with the virtual capabilities of the regional traffic management system. Provides workstation capabilities for the City to access regional traffic management assets, as well as integration of City field and central systems into the Virtual TMC.
TM-15	Regional Transportation Management	ACHD Backup Control Center/Backend Equipment	ACHD		Medium Term	$100	Provide for redundant central systems backend/operations facility outside of existing ACHD facility, which is located in a floodplain. The ACHD Sheriff's Office has been identified as a likely backup location.
TM-16	Regional Transportation Management	ACHD Automatic Vehicle Location (AVL) Snowplow Location Tracking	ACHD		Near Term	$30	Deployment of Automatic Vehicle Location (AVL) technology to all ACHD in-service vehicles and create public information webpage on road plowing status and road conditions.
TM-17	Regional Transportation Management	iNet Replacement	ITD HQ		Near Term	$2,500	Replacement and upgrade of existing ITS control software (iNet). Incorprate improvements that allow for other agencies to input data to be used in virtual TMC.

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