MEMORANDUM

TO: Southwest Washington Regional Transportation Council Board of Directors

FROM: Matt Ransom, Executive Director

DATE: September 27, 2016

SUBJECT: **Vancouver Area Smart Trek (VAST), Annual Program Report**

AT A GLANCE

This informational item is the annual report on the VAST Program, its recent accomplishments, and ongoing activities. The VAST Program has been one of RTC's ongoing programs since 2001. It links ITS technology and infrastructure projects with agency collaboration to improve the operation of the transportation system.

INTRODUCTION

The purpose of this memo is to provide the annual program update to the RTC Board on the accomplishments of the VAST Program in the last year and an outline of future program activities.

The Vancouver Area Smart Trek (VAST) program is a partnership of transportation agencies in the Clark County region established to improve transportation system performance by collaborating on signal systems, freeway and arterial management, traveler information, and transit signal priority projects through the use of smart technology and the system infrastructure needed to support it. RTC has managed the program since 2001 assisting partner agencies in identifying and developing operational projects to benefit the region. The VAST agencies are WSDOT, Clark County, City of Vancouver, C-TRAN, City of Camas, and RTC.

The Program focuses on strategies and the supporting technology that implement operational and multimodal approaches that make better use of existing transportation facilities by improving system efficiency and performance. They represent the non-capital component of the regional transportation program and emphasize improvements that leverage technology to manage the system without adding new roadway capacity. The operational strategies were prepared through the region's 2011 Transportation System Management and Operations (TSMO) plan which supports regional transportation goals by improving travel time reliability, reducing crashes, improving transit on-time performance, and by reducing travel delay, fuel use, and air pollution.

FEDERAL REQUIREMENTS

The ITS element of the VAST program meets federal requirements for planning, development, and implementation of ITS projects. Federal regulation 23 CFR 940 requires that regions develop and maintain a regional ITS architecture to ensure that ITS technology projects are interoperable and that it must include participation from transportation stakeholders so that projects are coordinated and integrated. The TSMO element directly supports the federal Congestion Management Process (CMP) by providing regional services to agency partners to

improve transportation performance by collaborating on operational strategies. Federal regulation 23 CFR 450.320(c) for the CMP requires that agencies collaborate to utilize operational management, demand management, transit, and ITS technology to address travel demand before adding roadway capacity.

REGIONAL COLLABORATION

The VAST Program recognizes that the successful implementation of operational strategies requires cooperation between transportation agencies and interoperability between intelligent transportation system (ITS) technologies.

The VAST Steering Committee discusses transportation operations and technology and has been both a successful collaboration and an effective way for the agencies to coordinate on project delivery, joint project funding, monitoring project development, and project integration. RTC also manages the VAST Communications Infrastructure Committee (CIC). The CIC, which addresses sharing, maintenance, and standards for communications infrastructure and equipment, is made up of both transportation and communications technical staff from the VAST agencies. The VAST program is funded primarily through federal grants and has resulted in projects that benefit individual transportation agencies and the Clark County region resulting in a valuable pathway for developing and securing funding for ITS/operations projects totaling more than $26 million in federal funding since 2001. A wide range of projects to improve transportation operations, and to build the supporting communications and technology, have been funded since the initiation of the program. They include central signal system upgrades, new signal controllers, signal optimization projects, freeway and arterial detection, cameras, variable message signs, and transit signal priority as well as the fiber and network communications needed for connecting ITS devices and infrastructure.

RECENT VAST PROGRAM ACCOMPLISHMENTS

Agency Projects Programmed in 2015

The TSMO Plan connects the planning process with project implementation. RTC's role in operations planning is intended to identify the best operational projects in coordination with the partner agencies, while the agencies are responsible for project delivery. RTC works closely with the VAST agency partners to identify projects and develop funding applications for the partner agencies. Operational projects programmed in 2015 are listed in the table below:

Project	Agency	Summary	CMAQ	Local
WRIGHT	Clark County	Software, hardware upgrades, mulitagency video sharing	$685.4k	$234.6k
SR-14 ATIS	WSDOT	New detection, cameras, and fiber between I-5 and I-205	$819.5k	$280.5k
Joint ATMS	WSDOT	Move to single, shared central system with Clark County	$149.0k	$51.0k
Mill Plain Signal Upgrades	Vancouver	New CPUs at 15 intersections for improved signal coordination and analytics	$72.7k	$24.9k

Mill Plain TSP Phase 2	C-TRAN	Expand TSP on Mill Plain; add TSP to 164th Avenue	$195.6k	$66.9k
		Total	*$1,922.2k*	*$657.9k*

Successful Partnerships

VAST agency collaboration and federal funding through RTC has also led to successful agency partnerships. The following examples demonstrate some of the more visible projects.

- *Regional Transportation Data Archive:* RTC and the VAST agencies have an ongoing partnership with Portland State University in the regional transportation data archive known as Portal. The Portal archive contains, in a single location, historical and real-time transportation data from agencies in the Vancouver-Portland region. This information warehouse can be used by researchers, planners, traffic engineers, and the public to look at multimodal transportation performance throughout the region. In 2016, RTC has worked with Portal staff and VAST agencies to implement two key enhancements to the archive site.
  - RTC has coordinated with PSU, Clark County, WSDOT, and ODOT to retrieve vehicle length data from existing radar and loop detectors as an indicator of freight/truck volumes and have agreed on a definition of vehicle length categories. Sample vehicle length data is being tested in Portal, and a regular vehicle length data feed from WSDOT and Clark County will be completed by the end of the year.
  - PSU has completed testing of a data feed from C-TRAN and is now receiving a regular feed from C-TRAN. The user interface will be available on Portal by the end of September.
- *Shared Communications Fiber and Asset Management*: VAST agencies have had a Communications and Interoperability Agreement in place since July 2006 that authorizes agencies to enter into fiber asset sharing permits. The agreement has led to better use of existing fiber and communication equipment by sharing available capacity among agencies.

  The VAST agencies have a shared GIS database that displays communications fiber and equipment as well as their detailed attributes. This asset management tool facilitates and supports fiber sharing among partner agencies and also allows them to manage their own assets more effectively. The agencies can easily review the fiber and communication network, fiber ownership, capacity, and availability.

  Regional Communications Plan: RTC, in coordination with the VAST regional partner agencies, has completed an update to the regional ITS Communications Plan, now over 10 years old. The updated plan describes the existing communications networks of Clark County, the City of Vancouver, and WSDOT, identifies gaps in the network and other system needs, and develops a cohesive set of regional strategies to maintain, improve the network, and identify future needs.

TSMO PLAN UPDATE

RTC and the VAST agencies recently completed an update to the VAST TSMO Plan which was first developed and adopted by the RTC Board in May 2011. The updated plan is undergoing final review and the VAST Steering Committee is scheduled to take action to approve the plan at their meeting on September 28.

The purpose of the TSMO Plan is to guide the implementation of operational strategies and supporting Intelligent Transportation Systems (ITS) technologies for Clark County in Southwest Washington and presents a strategic framework for accomplishing transportation system management objectives. It also supports future ITS technology investments and capital improvements necessary to accomplish those objectives.

While the original plan was intended as a 10-year vision, this Plan update is a 5-year look that better reflects of both the nature of TSMO strategies as viable near-term solutions to operational deficiencies, as well as the rapid evolution of ITS technologies and operations practices. The following sections provide a summary of the primary plan elements.

Regional TSMO Vision

TSMO provides options to address transportation needs where conventional transportation investments may be cost prohibitive, infeasible, or undesirable. In this way, TSMO is complementary to other regional transportation strategies and should be considered an integral part of the region's toolkit to address existing and future needs. The TSMO Vision is to: *develop and implement strategies promote more efficient and cost-effective use of the existing transportation system, providing increased accessibility, reliability, and safety for people and freight.*

Emerging Issues and Trends

Based on input from the VAST member agencies, the plan identifies current and emerging operations issues and trends that are impacting the direction of transportation systems management and operations in the region. These issues have been taken into consideration in the update of the TSMO strategies toolkit. The following is a partial list of trends identified in the Plan. These issues will need to be revisited periodically because of the evolving nature of transportation technology.

Emerging Issues and Trends	Opportunities and Impacts for TSMO in Clark County
Connected and Autonomous Vehicles (CAVs)	Connected and autonomous vehicle are anticipated to have a profound impact on the surface transportation system. A substantial amount of activity is currently underway to develop technologies, industry partnerships, technical standards, and policy frameworks to support the implementation of CAVs. The plan calls for agencies to "future proof" infrastructure to accommodate CAVs as devices and standards become available such as the installation of high powered signal controllers that can process large amounts of data and can communicate with vehicles and other roadside devices.
Quality, Integration, and Open Sharing of	Transportation data is an increasingly important asset to be managed and leveraged to achieve public benefits.

Transportation Data	An example is the use of highway and transit agency data by third-party mapping applications to provide multi-modal trip planning and real-time traffic and service conditions. The VAST agencies have identified the opportunity to continue to increase the accessibility and exchange of data from formerly "closed" systems such as traffic signal systems and transit management.
Supporting Emerging Operational Strategies	Innovation is at the heart of the VAST community, and new TSMO strategies have been identified that can address the transportation needs of the region. One example is exploring the use of Bus on Shoulder (BOS) for C-TRAN buses on SR 14 and along the bi-state I-205 corridor. Other examples include the potential for expanded use of ramp metering or freeway active traffic management (ATM) in the region, topics that will be studied in the near future led by WSDOT.
Cost Sharing and Sustainable Funding	An ongoing commitment of sustainable, predictable funding is required to maintain the existing TSMO capabilities and ITS infrastructure that exists today, let alone to expand capabilities or coverage in response to emerging needs and opportunities.
ITS Infrastructure Renewal and Asset Management	Due to the successes of past efforts, VAST agencies have deployed substantial ITS infrastructure and communication equipment across the region. Like any transportation infrastructure, these systems and devices require a systematic approach and sustained funding to ensure asset replacement and continued operation of the system.
Bi-State Coordination	In the past few years, the region has implemented significant bi-state TSMO initiatives with partner agencies in Oregon – most notably the bi-state traveler information system (WSDOT/ODOT), the new regional electronic transit fare collection system (C-TRAN with TriMet), the bi-state interagency ITS Network, and the PORTAL regional transportation data archive.
Opportunities for Collaborative Initiatives and Shared Infrastructure	Build upon current collaboration in shared fiber/communications infrastructure, video sharing, and bi-state travel time. Explore new areas between agencies for improved functionality, seamless systems, better operations and cost savings.
Regional Performance Measurement	The role of Performance Measurement in transportation planning and investment is increasing at the agency, state, and federal levels. VAST agencies recognize the need for more robust metrics than traditional volume/capacity (v/c) ratios. Performance measurement can leverage data generated by ITS field systems and aggregated through the PORTAL regional data archive. Automation of data collection and performance measurement through improved data analytics will reduce the burden of generating performance measures.

Current TSMO Strategies Status and Future Goals

As part of the TSMO plan update, VAST members reviewed the 2011 plan, identified strategies that have been advanced over the last 5 years, and how they would like to see strategies implemented in the next 5 years. The strategies below are a sampling of the accomplishments, strategies and future goals contained in the TSMO Plan.

TSMO Toolkit Strategy	Current Level and Key Accomplishments since 2011	Future Level and 5-Year Strategic Goals
Active Traffic Management	No implementations in the region to date; examples in Puget Sound Region and Oregon to draw upon	Study feasibility of Active Traffic Management in the region. Plan/implement if warranted by study
Ramp metering	Maintenance of existing, limited ramp metering infrastructure in the region.	WSDOT is undertaking a study of ramp metering and its application to all Clark County urban freeways. Plan/implement if warranted by study
Enhanced traffic signal operations	Clark County has expanded and improved traffic signal management and detection capabilities. Traffic signal controller CPU's are being upgraded on some corridors in the region and new functionality, e.g. Arrival on Green, is being tested	Expand upgraded controllers to improve system performance. Allows communication with Connected and Autonomous Vehicles, adaptive or traffic responsive signal control, and performance measurement
Traffic surveillance	Agencies have deployed additional traffic cameras across the region and video sharing has been tested	Agencies will be implementing a video sharing project for Clark County, WSDOT and Vancouver transportation. Future expansion could include public safety and emergency management.
Transit signal priority (TSP)	TSP pilot project was implemented on Mill Plain	TSP to be implemented on HWY 99, extended on Mill Plain and 164th and implemented on Fourth Plain with the BRT project
Regional transit fare integration	C-TRAN is working with TriMet to design and implement a Region-wide integrated smart fare system	Begin operations of regional smart card fare system (Hop Fastpass™) – estimated 2017
Regional Traveler Information	Congestion and construction information is available on the SW Region WSDOT website and travel time on the WSDOT official app	Clark County is planning to provide traffic video and arterial congestion information over the web. WSDOT is considering dissemination of near real time traffic CCTV video clips, a capability currently provided in WSDOT Northwest region

Implementation Plan

The operational strategies described in the Regional Implementation Plan section identifies the enabling ITS technology and equipment needed to deploy the strategies and provides a roadmap for building ITS field equipment and technology to support system management and operations over the next ten years.

ITS implementation guidelines have been developed as part of the Plan to describe functional guidelines and specifications for ITS technologies to ensure that these investments support

TSMO objectives in an effective, interoperable manner. Examples include the location of surveillance cameras (intersections, high incident locations, etc.) to support incident and emergency management activities, or the spacing and quality of traffic detection to adequately capture traffic flow or travel-time measures.

By comparing these standards to existing ITS deployments in the region, the future ITS needs of the region to support TSMO have been identified at the corridor level. The guidance contained in the Plan is a valuable guideline for future project-level planning and design for ITS implementation.

To fulfill the TSMO vision for the region, the Implementation Plan provides the necessary direction to agencies on the enabling ITS infrastructure that is required to support each of the TSMO strategies in the corridors defined in the TSMO network.

By comparing the 'baseline' ITS deployment in the region today to the ITS implementation standard, it is possible to estimate the level of future ITS deployment needed in the region to fulfill the TSMO vision.

FUTURE PROGRAM

The VAST Program will continue the coordination and management of ITS and operations related activities which includes providing support to partner agencies on:

- Transportation operations and planning
- ITS projects, communications, and integration
- Managing the TSMO/ITS committees
- Assisting in the development of funding applications for operational and ITS projects
- Coordinating on performance measurement of operational projects
- Ensuring that projects are interoperable

In addition, RTC will continue to manage the VAST Steering Committee and Communications Infrastructure Committee and in the next year will include:

- Continue the expansion of communications infrastructure sharing between VAST agencies
- Maintain and update the shared fiber asset database management system
- Identify additional funding opportunities
- Continue development of and agreements on fiber, equipment, and infrastructure standards

The VAST program will continue to utilize technical assistance and support the PSU data archive in carrying out the activities described above.