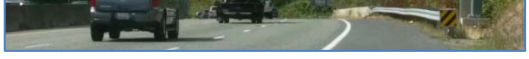
Vancouver Area Smart Trek (VAST)

Annual Program Report
(YR 2019)

A regional partnership of:



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INTRODUCTION

The VAST Program focuses on lower cost operational and ITS technology approaches that make better use of existing transportation facilities by improving system efficiency and performance. It represents the non-capital component of regional transportation and emphasizes 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. The 2016 TSMO Plan Update tracked advances in technology and operations since 2011, identifies emerging issues, such as connected and autonomous vehicles, and lays out future strategies for the continued implementation of operational strategies over the next five to ten years.

FEDERAL REQUIREMENTS

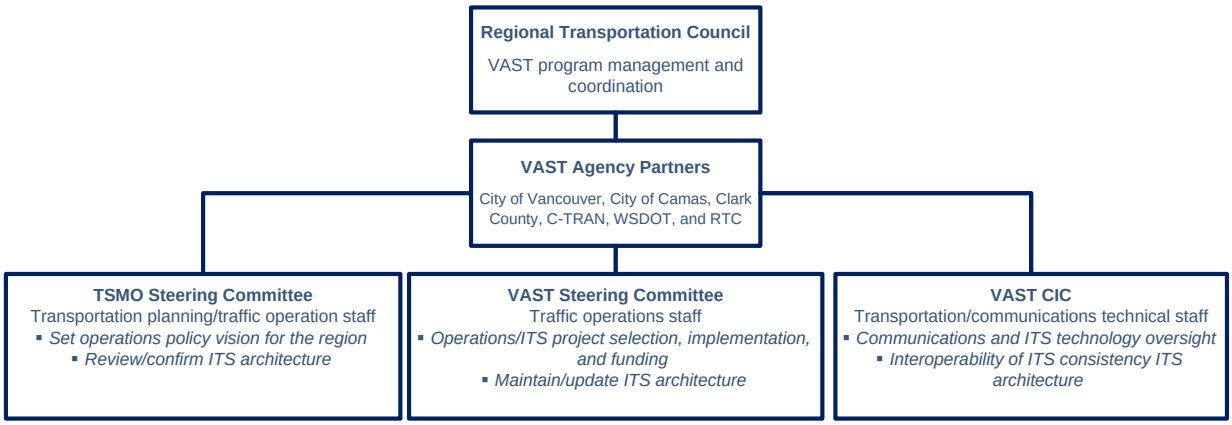
The ITS element of the VAST program meets federal requirements for planning, development, and implementation of ITS projects. Federal regulation 23 CFR 940 requires that regions develop and maintain a regional ITS architecture to ensure that ITS technology projects are interoperable and that it must include participation from transportation stakeholders so that projects are coordinated and integrated. The TSMO element of the Program 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. In addition, a Memorandum of Understanding executed between WSDOT, C-TRAN and RTC ensures that that planning and deployment of ITS projects and operations are consistent and integrated with the ITS vision for the Clark County region.

MODEL for 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.

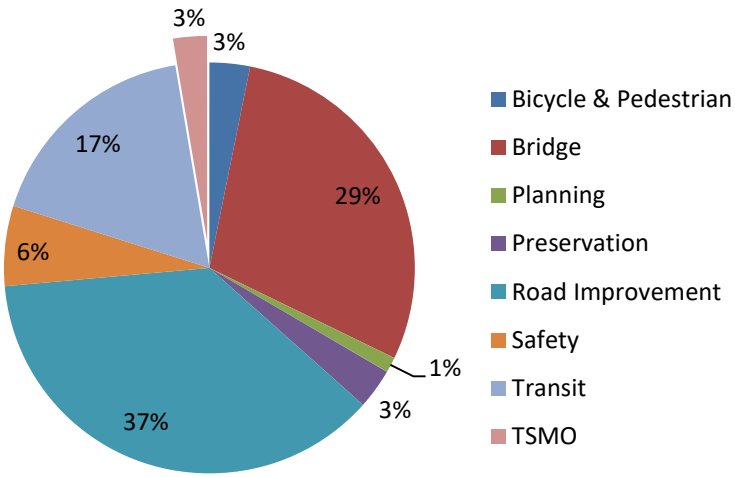
The VAST Steering Committee discusses transportation operations and technology and has been both a successful collaboration and an effective way for the agencies to coordinate on project delivery, joint project funding, monitoring project development, and project integration. RTC also manages the VAST 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. A chart of the program structure is shown on the following page.

VAST Program Structure



The VAST program is funded primarily through federal grants awarded through RTC 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 $34 million in federal funding over the last 17 years. 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. These investments are a small, but effective part of the overall transportation funding program. For example, the 2020-2023 TIP has $343.8m in programmed projects. TSMO category makes up about 3% of the total program.

Percentage of Dollars Programmed by Project Type ($343.8m total)



ONGOING PROGRAM ACTIVITIES

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
- Manage the TSMO/ITS committees
- Funding applications for operations and ITS projects
- Performance measurement of operational projects
- Ensure 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 expansion of communications infrastructure
- Maintain and update shared asset management database
- Identify additional funding opportunities
- Develop agreements, on fiber, infrastructure, and equipment

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

The first TSMO Plan, in 2011, set the policy and performance guidelines for the consideration of regional operational strategies in Clark County. The 2016 update laid out strategies for the continued implementation of operational strategies over the next five to ten years. The Regional Communications Plan describes the communications and network needs which are critical components of the regional transportation system and is fundamental to connecting management centers with field equipment that facilitate regional mobility. The ITS Regional Architecture provides a framework for integrating existing and planned ITS systems for transportation agencies in the region.

Program Activity	Status	Next Update
TSMO Plan	Current	2021
Regional Communications Plan	Current	2021
ITS Regional Architecture	Needs update	2020
Fiber Sharing Permits	Current	ongoing

VAST PROGRAM AGREEMENTS

The VAST agencies adopted of a memorandum of understanding 2001 that outlines how agencies collaborate on ITS project coordination and integration, review, and guidance, and endorsement; and ensuring that the communications network for VAST is integrated. A Communications was executed in 2004 that addresses the use, sharing, maintenance, and standards for communications infrastructure and equipment. Oher agreements are also summarized below.

Agreement	Entities	Status
Memorandum of Understanding (MOU) Defined how the agencies work together on ITS policy, plans, programs, and projects. *Formed the VAST Steering Committee*	Clark County WSDOT C-TRAN Vancouver RTC	Ongoing
MOU for Communications Similar to first MOU, but focused on communications infrastructure. Defined how partners work together on ITS infrastructure and devices. *Formed the Communication Infrastructure Committee***.**	same	Ongoing
Communications Interoperability Agreement Gives authority for at staff level for entering into fiber and communication sharing agreements, or permits, to the CIC for use by VAST agencies	same	Periodic amendments to update contract managers, permit format, etc.
MOU with C-TRAN, WSDOT, and RTC To ensure that that planning and deployment of ITS projects and operations are consistent and integrated with the ITS vision for the Clark County region	same	Periodic review
OSPInSight Agreement ESRI Based database mapping tool shared among all the VAST agencies that displays communications fiber and equipment as well as their detailed attributes. Supports fiber sharing among agencies and allows agencies to manage their own assets more effectively	same	Annual licensing review

RECENT VAST ACCOMPLISHMENTS

Recently Programmed Agency Projects

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 federal funding applications that leverage local funds for the partner agencies.

Selected operational projects programmed in the 2019-2022 TIP are listed in the following table. These projects consist of $1.3 million in federal funds leveraging more than $375k in local funds.

Project	Agency	Summary	CMAQ	Local
NE 134th Adaptive Signals	Clark County	Expansion of bluetooth travel time data collection and dashboard for operational analysis.	$523k	$144k
I-205/NB Ramp Meter from Mill Plain Blvd.	WSDOT	Install ramp meters, mast arms, signals, and cameras	$298k	$102k
System wide signal enhancement	Clark County/WSDOT	Create dashboard of near real-time information about performance measures on the transportation network to improve signal coordination and analytics.	$471k	$129k

Upcoming 2020-2023 TIP Projects *(RTC Board Resolution 10-19-25)*

Regional Signal System: *($700k CMAQ)* The integration of central signal systems in the region has seen a steady progression over the last several years. Last year, Clark County and WSDOT were connected into the same central signal system. Battle Ground, Camas and Washougal are being added to the system next year. This programmed project will add the City of Vancouver, linking all the jurisdictions into the same central signal system.

WSDOT Ramp Meter

I-205 SB ramp meters: (*$2.5m CMAQ)* Builds upon existing and programmed I-205 ramp meters and will implement meters along the I-205 corridor Padden Parkway to Mill Plain Boulevard. The southbound ramp meters are also part of the Vancouver East Highway Operations Study recommendations for I-205.

Adaptive Signal Expansion: *($600k CMAQ)* This project consists of improvements in the Salmon Creek and Hazel Dell areas as the next step in the operation and expansion of adaptive signals in Clark County.

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 noteworthy efforts.

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 (http://portal.its.pdx.edu/home/). The Portal archive contains, in a single location, historical and real-time transportation data from agencies in the Vancouver-Portland region. This information warehouse is used by researchers, planners, traffic engineers, and the public to look at multimodal transportation performance throughout the region.

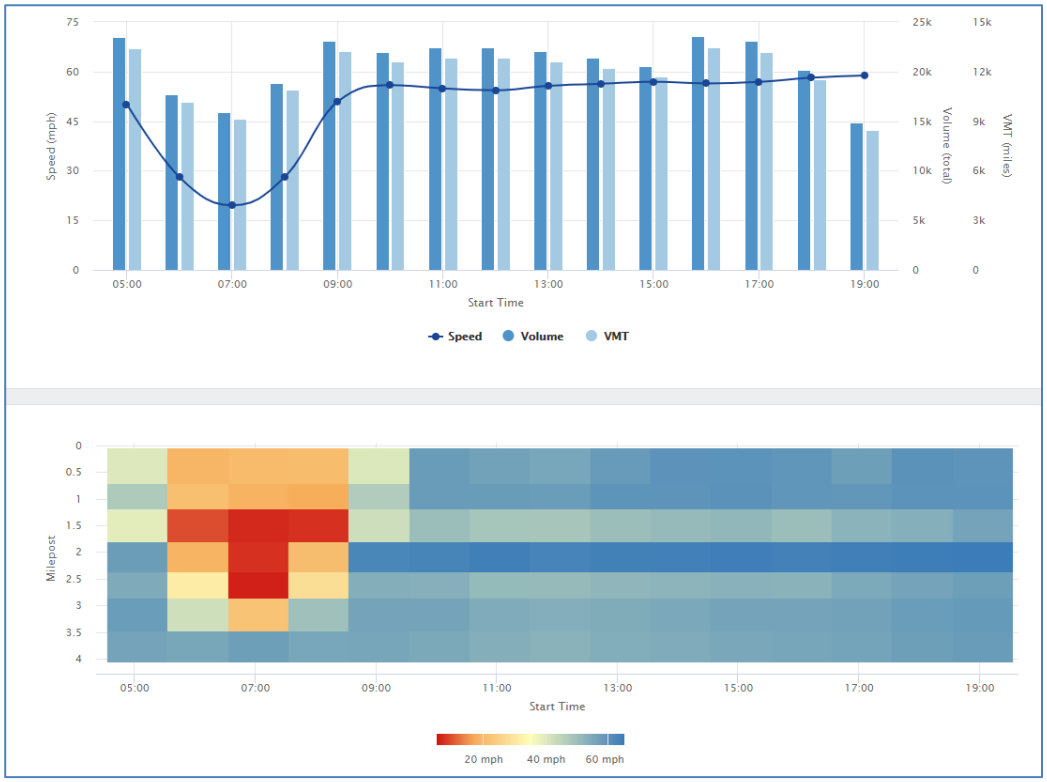
Recent efforts have focused improving the quality and usability of the existing data. Several issues have been addressed: the calculation of average volume under certain parameters were not accurate and have been fixed, several data stations have been modified for more accurate geocoding, and lane definitions were updated for selected stations. Some stations, for example, were only counting through lanes but not auxiliary lanes.

The primary change for new data over the last year has been the addition of an ongoing feed of transit ridership, on and off stop data, and on-time performance from C-TRAN. This data is currently being archived, but not yet published.

Over the last month, RTC has hosted a series of workshops for the three main Portal information sources: highway data, arterial data and transit data. The purpose of the workshops, which included attendance from Vancouver and Portland area agencies, were to generate ideas to better meet user needs for data visualizations, functionality, and data quality with the goal to define the Portal work tasks for the next year.

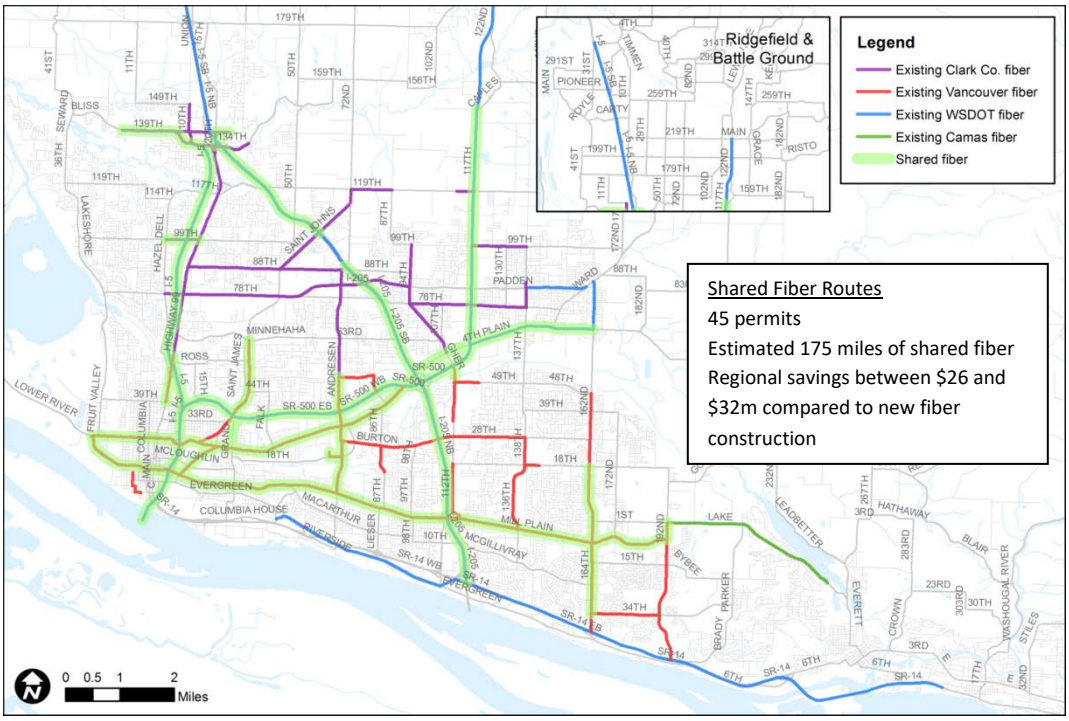
The workshops resulted in identifying a wide range of data improvements and enhancements for each of three data sources. Portal and RTC are in the process of documenting the discussion and to identify level of effort and priorities for updates. Some of the desired outcomes are clearly defined and will be the first priority for improvement. These include modifying the arterial data page to match the look and feel of the highway page, adding WSDOT highways to the travel time page, and allowing the calculation of route travel time between jurisdictions and facility types.

Portal Data: I-5 Southbound, 78th to Interstate Bridge, 5 am to 7 pm



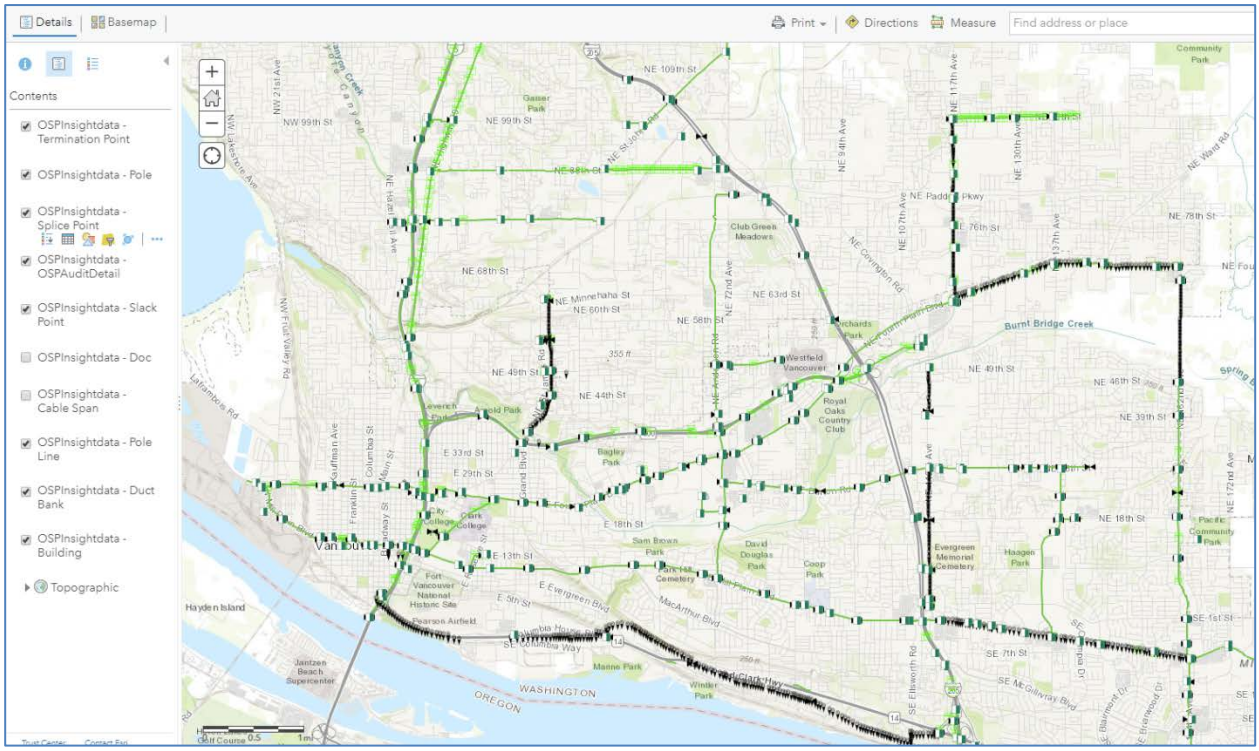
Shared Communications Fiber: VAST agencies have had a Communications and Interoperability Agreement in place since July 2006 that authorizes agencies to enter into fiber asset sharing permits. The agreement has led to better use of existing fiber and communication equipment by sharing available capacity among agencies.

VAST Agency Fiber by Ownership and Shared Routes



Asset Management: The VAST agencies are using a shared GIS mapping database (OSPInSight) 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. While the software has been a valuable tool for tracking and sharing fiber assets, it has been difficult to access it from outside the County network, where the database is located. A key improvement in the last year has been the development and use of a web application tool that allows outside agencies to easily view information such as fiber and communication network, fiber ownership, capacity, and availability.

OSP InSight Map of VAST Agency Fiber and Devices



EMERGING ISSUES and TRENDS

The TSMO plan identifies current and emerging operations issues and trends that are impacting the direction of transportation systems management and operations in the region. The following is a partial list of trends identified in the Plan and how the region and VAST agencies have responded with associated projects, programmed initiatives, and planned activities. These issues will need to be revisited periodically because of the evolving nature of transportation technology and will be reviewed by the VAST members in the next year to both acknowledge recent and future strategy implementations in the region and to consider potential changes to technology and communications.

Emerging Issues and Trends	Related TSMO Project or Initiative
Supporting Emerging Operational Strategies	• SR-14 Bus on Shoulder (BOS) from 164th to I-205 has been in place since October 2017 • The SR-14 expansion project will include peak shoulder running westbound from 164th to I-205 • WSDOT, ODOT and C-TRAN are planning to implement southbound BOS on the Glenn Jackson Bridge from SR-14 to Airport Way during the Interstate Bridge Trunnion repair project in September 2020. • WSDOT and ODOT have had preliminary discussion to consider peak period hard shoulder running on GJB SB from SR-14 to Airport Way. Further analysis and review is needed. • WSDOT will be constructing ramp meters and variable speed signs on I-5 south from 78th Street to the Interstate Bridge to open in summer 2020 prior to the I-5 closure. • WSDOT and C-TRAN are collaborating to construct BOS on I-5 from 99th Street to Interstate Bridge to open in summer 2020 prior to the I-5 closure • WSDOT implemented a ramp meter on SR-500 to I-205 north in June 2019 • The Vancouver East Highway Operations Study (VEHOPS) has recommended a series of low cost operational improvements for the I-205 corridor. • The Urban Freeway Corridor Operations Study is underway and is being managed by RTC in partnership with WSDOT. A workshop was held in May to identify operational strategies for analysis on I-5, I-205, SR-500 and SR-14. Initial strategy analysis will be complete in November with recommendations expected early next year. Strategies for analysis include active traffic management, lane restriping and extensions, ramp meters, ramp modifications, and integrated corridor management. Outcomes include recommendations on an integrated set of improvements and strategies for on Clark County freeways.
Opportunities for Collaborative Initiatives and Shared Infrastructure	• Build upon collaboration to share video, set common standards for fiber and communications infrastructure, development of a common construction notification system, and an integrated central signal system for the region. • Agencies have continued to expand fiber sharing permits with 45 permits signed since 2006 with 174 miles of shared fiber assets.

Smart Communities	• Refers to the application of information technology to increase the connectivity and intelligence of urban infrastructure. This concept, referred to as "Smart Communities", envisions integrated urban infrastructure to provide real-time monitoring information, user feedback, and performance measurement. The result is a safer, more efficient, and more user-responsible urban infrastructure. • RTC hosted a Smart Cities Workshop in late 2017 to provide a general overview of the Smart Cities concept and how they can benefit communities and services. • As a follow up to the 2017 effort the VAST agency partners and RTC has been collecting thoughts and ideas and wants to move to the next step of concrete planning and implementation to reduce siloes and move toward a systematic view of transportation and related mobility areas. VAST agencies are cooperatively funding the next logical step in this development with the Smart Communities Assessment for Transportation and Stakeholder Engagement which is described in the last section of this memorandum.

2016 TSMO PLAN

The TSMO Plan, last updated in 2016, was first developed and adopted by the RTC Board in May 2011. The TSMO Plan guides 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. It is a 5 to 10 year look that better reflects 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 TSMO Plan was developed around a regional vision for coordinated and integrated operation of the regional transportation system, as articulated in the TSMO Vision Statement below. TSMO programs and investments in Clark County use innovative and proactive operational strategies to maximize the transportation system efficiency. It focuses on lower cost operational and multimodal strategies that are regionally coordinated in an effort to better utilize existing transportation facilities.

TSMO Vision for Clark County

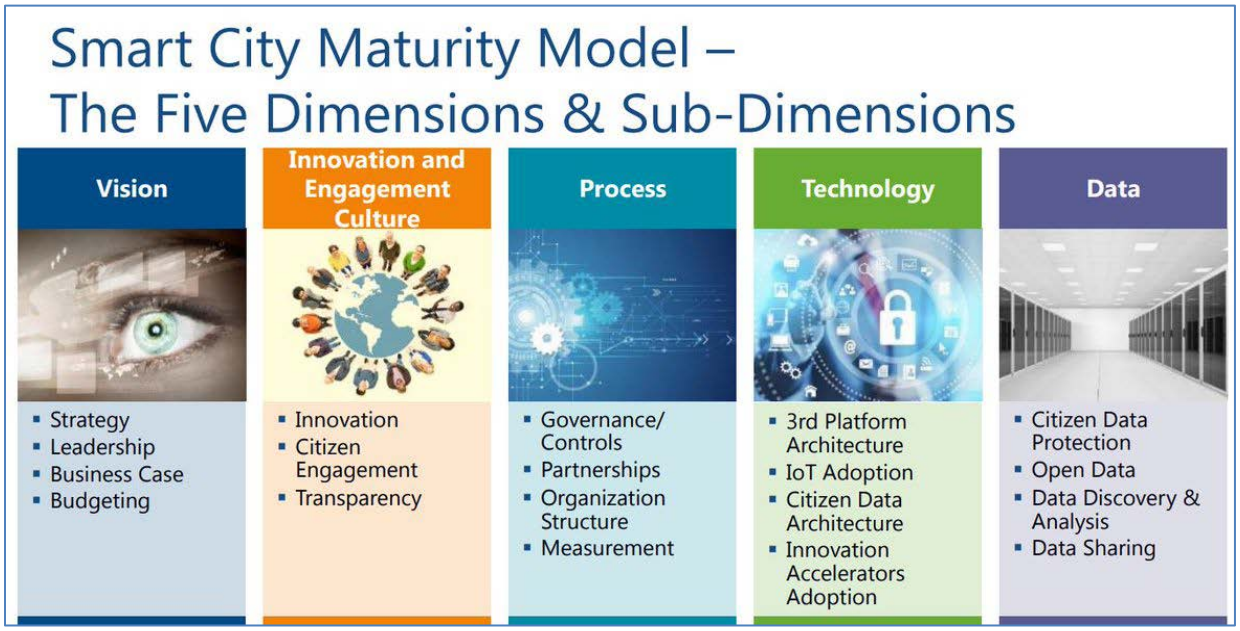
Transportation System Management and Operation (TSMO) strategies promote more efficient and cost-effective use of the existing transportation system, providing increased accessibility, reliability, and safety for people and freight

TSMO provides options to address transportation needs where conventional transportation investments may be cost prohibitive, infeasible, or undesirable. In this way, TSMO is highly complementary to other regional transportation strategy and should be considered an integral part of the region's toolkit to address existing and future needs.

SMART COMMUNITIES ASSESSMENT

The Smart Communities Assessment (SCA) process, funded jointly by Vancouver, WSDOT, Clark County, C-TRAN, and RTC, builds upon the initiatives and projects that have already been developed under the Vancouver Area Smart Trek Program.

The SCA includes engaging with transportation agencies, internal departments, elected officials and policy makers to evaluate current practices and develop a model to guide the implementation of emerging technologies for mobility and transportation by reducing siloes and furthering integration.



An evaluation and assessment of Vancouver area agencies on the development of their smart community's capacity and practices will help cities, counties, and state governments leverage technology to improve urban operations and better serve residents and the community. The SCA scope of work consists of two main tasks which are listed below.

A Forum to Align Stakeholders and Build Support: A full day workshop will be held with up to 30 IT and non-IT executives from agencies, departments, and other stakeholder groups focused on the topics of Smart Communities and Transportation with the goal of aligning stakeholders around a common mission, identify need areas and areas for transformation for more efficient and effective services. The forum will consist of: a two-hour session with elected officials focused on smart cities and transportation; a four-hour session to discuss technology advances and issues with more technical or operations staff; and a one-hour debrief to the RTC Board with a summary of discussion and issue from the previous sessions.

Measure and Assess Current Competencies and Need Areas: The consultant will conduct a focused readiness/maturity assessment for mobility and transportation in the region. This would include participation by 7- 8 agencies such as WSDOT, Clark County, City of Vancouver, C-TRAN, and RTC. The assessment will look at key performance areas for digital transformation including Vision, Culture, Process, Key Technologies, and Data. It will consist of a widely distributed 20 to 30 minute online survey that will provide benchmarks as compared to other cities in the country. The survey

outcomes will provide Gap analysis results to determine strengths, areas for improvement and to inform the strategic action plan. A presentation and discussion of the assessment results will be presented to RTC Board when complete.

The SCA schedule is currently being developed, but planned to begin early next year.