



**FINAL**

# TIDEFLATS AND PORT OF TACOMA ITS STRATEGIC PLAN



**DECEMBER 2015**

**PREPARED FOR:**  
**PORT OF TACOMA**  
**CITY OF TACOMA**

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## Glossary of Terms

AVL	Automated Vehicle Location
CAD	Computer Aided Dispatch
CCTV	Closed Circuit Television
COMM HUB	Communications Hub
FHWA	Federal Highway Administration
GIS	Geographical Information System
GPS	Global Positioning System
HAR	Highway Advisory Radio
ITE	Institute of Transportation Engineers
ITS	Intelligent Transportation System
IT	Information Technology
PSRC	Puget Sound Regional Council
RYG	Red-Yellow-Green Signal
TMS	Transportation Management System
VMS	Variable Message Sign

## EXECUTIVE SUMMARY

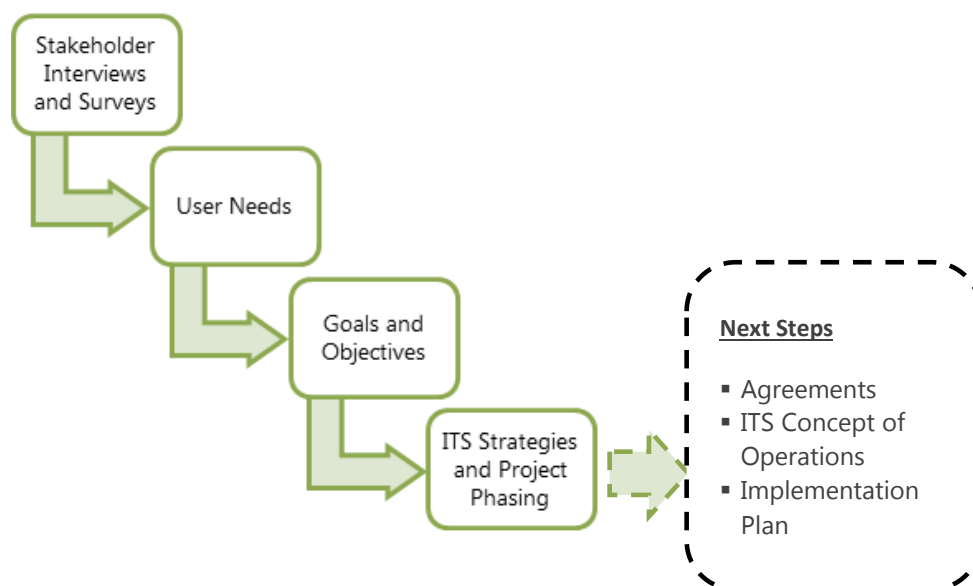
Intelligent Transportation Systems (ITS) utilize technology as a means to improve the overall transportation environment. They have the ability to not only increase the capacity of the transportation network but can divert or adjust the demand on the network, and inform the users of the transportation system.

The ITS Strategic Plan for the Tideflats and Port of Tacoma identifies the needs and strategies to improve safety, increase freight mobility and accommodate growth in the area. There are over 20 million tons of cargo transported through the Port each year, with a growing demand for space on a constrained transportation network. The ITS Strategic Plan provides a framework to meet that demand in the most economic and efficient means possible.

### Process

The goals and strategies of the plan were developed through a detailed process guided by a technical advisory committee consisting of Port staff, City of Tacoma and City of Fife staff, the Tacoma Fire Department, private stakeholders and WSDOT among others. This process gathered input on the needs of the area and detailed the existing and planned transportation infrastructure to understand how future projects may integrate with future investments.

**Figure E1. ITS Strategic Plan Process**





## Strategies

Six high-level ITS strategies with supporting ITS elements were assessed for their consistency with other planning efforts and for their ability to achieve the goals of the ITS Strategic Plan. These strategies informed the development of specific projects appropriate for the Tideflats area.

**Table E1. ITS Strategies and Elements Matched to Goals**

ITS Strategies	ITS Elements	ITS Strategic Plan Goals		
		Safety	Freight Mobility	Sustainable Growth Accommodation
Signal Optimization	Signal timing updates	●	●	●
	Signal actuation infrastructure			
Signal Priority and Pre-emption	Signal pre-emption upgrades	●		
Incident Management	PTZ camera infrastructure	●		
	Fiber splicing and switching equipment			
Tideflats-Area "511" Service	511 Deployment			
	GPS probe data			
	Vehicle detectors		●	●
	Variable Message Signs			
	Information distribution via web/mobile			
Active Lane Management	PTZ camera infrastructure			
	Fiber splice and switching equipment		●	●
	Lane configuration signage			
Supporting ITS Infrastructure	Fiber splits on Taylor Way			
	Installation/burying of fiber on Port of Tacoma Rd.	●	●	●
	Burying of overhead fiber and gap filling throughout Tideflats			

## Phasing

Specific projects tied to the strategies were developed and prioritized for short, mid and long-term phasing, with cost estimates provided for the short-term projects as shown in the table below.

**Table E2. Short-term ITS Projects**

Short-term ITS Project	Project ID	Cost Range (thousands)	Notes on Deployment
Construct initial ITS Infrastructure needed for basic information sharing among stakeholders	S2	\$150 - \$2,990	Costs vary depending on scope of implementation
Establish video-sharing between Port, City (Fire, PW, and Rail) and WSDOT	S5	Minimal cost based on MOUs	Systems will include continued deployment of Viewpoint and NW Seaport Alliance Operations along with existing WSDOT video
Add cameras to key existing at-grade rail crossings	S6	\$185 to \$350	PTZ camera installations at up to 8 railroad crossings
Install signal preemption for existing signals on priority corridors	S7	\$65 to \$150	Up to 10 signal updates along emergency response corridors
Update signal coordination for signals on Pacific Highway	S8	\$99 to \$135	Retiming for up to 10 total signals
Update signal coordination for signals on 54th Avenue	S8	\$55 to \$75	5 total signals re-timed and coordinated between I-5 and SR509.
ITS Coordinator	-	1 FTE	Based on final deployment level of ITS elements and the need between agencies for coordination



## ***Next Steps***

Implementation of the ITS Strategic Plan will require the coordination and integration of a number of agencies in the Tideflats area. The NW Seaport Alliance Operations Service Center Plans are currently under development and may be a key operational element in the implementation process. Initial agreements between agencies must be adopted and the development of a Concept of Operations will establish the roles and responsibilities of each party. An implementation plan will leverage agency coordination to refine the project phasing and develop final design for the system.





## INTRODUCTION AND BACKGROUND

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### STUDY AREA

The Tacoma Tideflats area is the heart of the area's industrial activity, serving a complexity of land uses with a multimodal transportation network. While many new transportation infrastructure projects are under construction or being planned for the area, there is a need to make the existing transportation network operate as efficiently as possible. To assist this effort, the Tideflats and Port of Tacoma ITS Strategic Plan provides a framework for building an Intelligent Transportation System (ITS) that will serve a wide variety of users in the area.

The Tideflats area encompasses the Port of Tacoma, portions of the City of Fife, unincorporated Pierce County and the Puyallup Indian Reservation, as shown in **Figure 1**. It includes the major freeways of I-5 and SR 509 along with other key corridors, such as Pacific Highway, Port of Tacoma Road and 54th Avenue. The area is a major industrial hub in the Puget Sound Region, with the Port of Tacoma covering over 2,400 acres and operating as one of the top ten largest ports in the U.S. Over 20 million tons of cargo move through the area each year<sup>1</sup>.

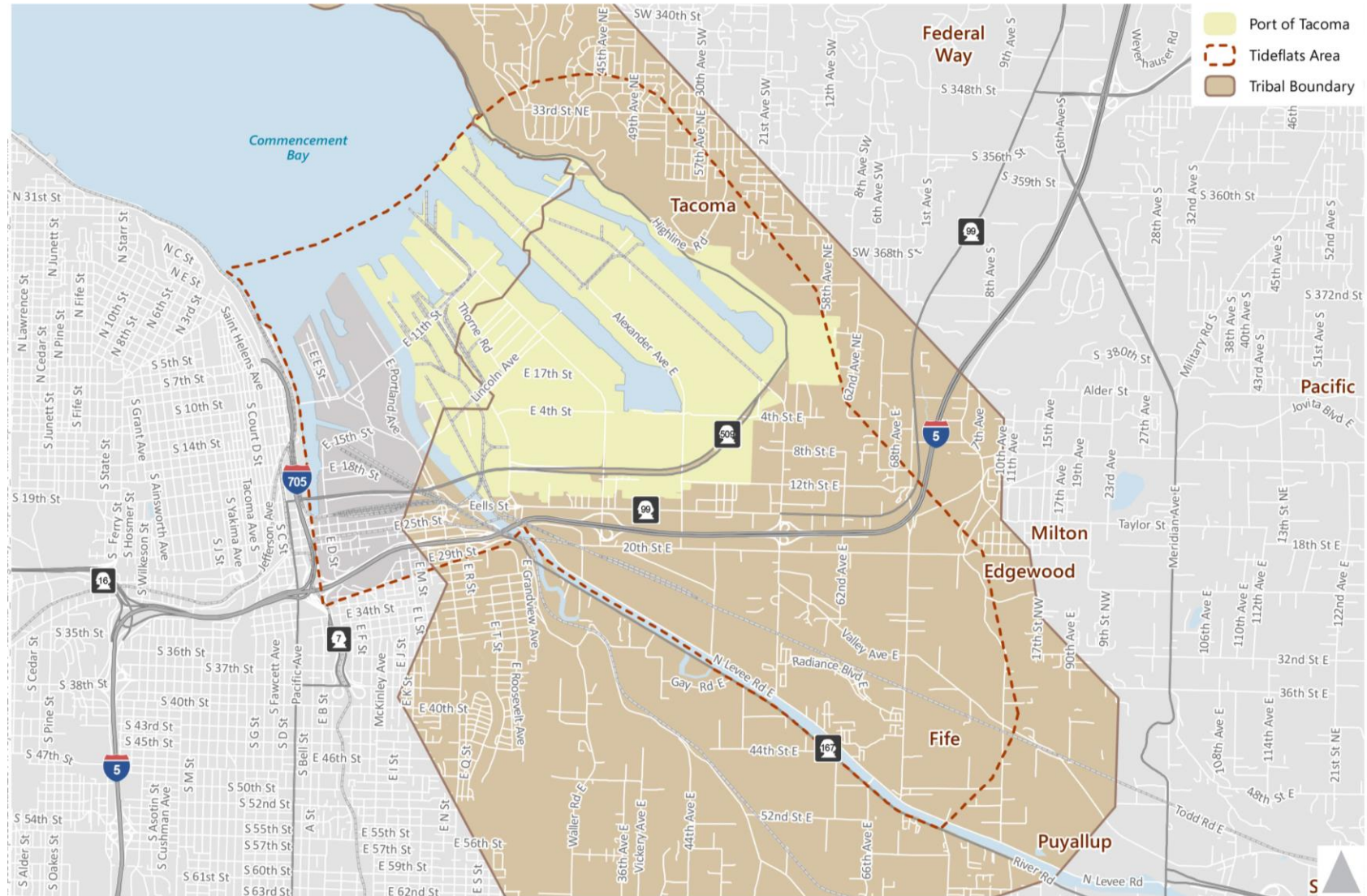
Intelligent Transportation Systems encompass physical infrastructure and processes that improve overall transportation operations and safety. They may include elements such as traffic cameras, fiber optic networks, variable message signs and adaptive signal control. An ITS system typically provides a lower cost alternative for improving transportation operations and safety without the need for additional roadways or other expensive infrastructure.

In order to implement ITS solutions and to obtain funding for construction, an ITS strategic plan is a beneficial and necessary step in the process. This plan builds upon previous transportation plans and takes advantage of existing and planned ITS infrastructure being implemented by various organizations. The plan identifies multiple ITS strategies that can help sustain growth over the next several years and includes a phasing plan to build the ITS partnerships and infrastructure in a realistic manner.

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<sup>1</sup> 2014 Trade Highlights, Port of Tacoma

Figure 1. Tideflats Area



## PREVIOUS PLANS

Previous studies in the area include the *Tideflats Area Transportation Study* (TATS) and the *Port of Tacoma Land Use and Transportation Plan* (LUTP). Additionally, the City of Tacoma's Comprehensive Plan was recently updated to include a Container Port element that provides goals and policies specifically for the Port Industrial Area. The Washington State Department of Transportation (WSDOT) also prepared a strategic ITS plan that includes state highways in the Tideflats area. Further details about these plans are provided in the existing and planned ITS infrastructure sections of this report.

In summary, the TATS encompassed a detailed assessment of the existing and future transportation conditions in the area and identified a set of phased transportation infrastructure projects necessary to sustain growth over the next 20 years. It involved detailed micro-simulation modeling to identify constraints in the network and to evaluate potential projects. This study laid the groundwork for considering an ITS program for the Tideflats area.

The LUTP identified specific strategies to direct and accommodate growth within the Port of Tacoma. The plan included a number of transportation investments needed for the Tideflats area, including Intelligent Transportation System strategies.

Ongoing planning work in the area includes the City of Tacoma's *Transportation Master Plan* (TMP), the *Tideflats Emergency Response Plan* (ER Plan) and the *Northwest Seaport Alliance Operation Service Center Plans*. The TMP and the ER Plan have identified certain ITS projects within the Tideflats that overlap with the work conducted in this plan. The Northwest Seaport Alliance Operation Service Center is an ongoing planning process to streamline joint operations between the Port of Seattle and the Port of Tacoma

## ITS STRATEGIC PLAN DEVELOPMENT

The development process for the ITS Strategic Plan included input from stakeholders, and translation of user needs into goals and objectives. **Figure 2** illustrates the steps involved in the plan development.

**Existing and Planned ITS Infrastructure Assessment** – Existing roadway and ITS infrastructure elements in the Tideflats were identified through data provided by agencies in the area.

**Stakeholder Interviews and Input** – A Technical Advisory Committee comprising various stakeholders in the area conducted a number of meetings and provided input to the plan development process via interviews and surveys.

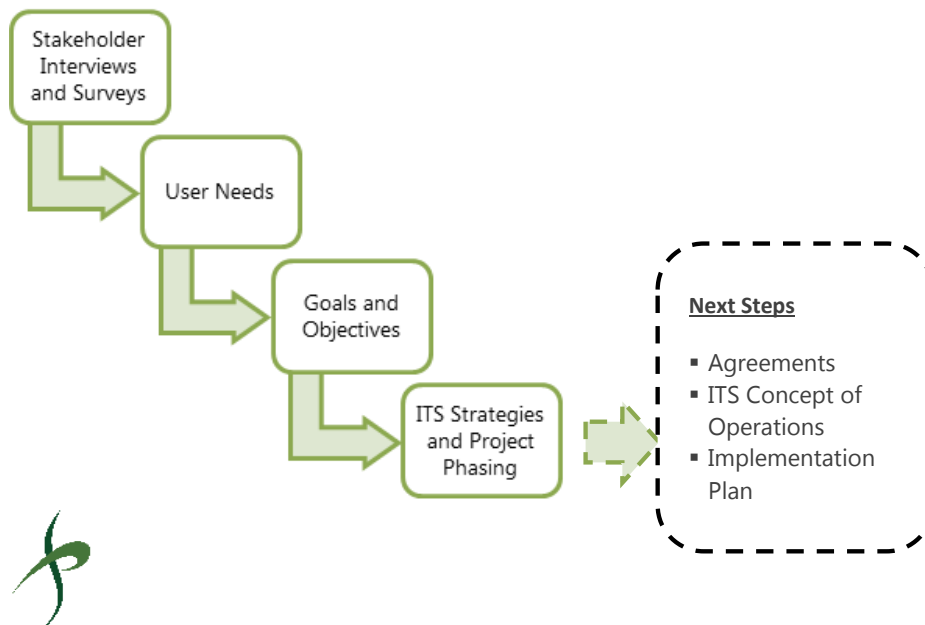
**User Needs** – A set of shared user needs were identified from the stakeholder input and were summarized into seven primary ITS needs.

**Goals and Objectives** – From the user needs, the group developed a set of goals and objectives. The goals provided the framework and guidelines in the development of the set of ITS strategies and projects.

**ITS Strategies** – Drawing from a set of available ITS tools, a set of six ITS strategies were identified and recommended for the Tideflats area. The strategies were chosen to fulfill the goals and to provide benefits to a number of agencies.

**ITS Project Phasing** – From the list of ITS strategies, the team recommended the specific ITS projects and infrastructure to implement and the appropriate phasing of those projects.

**Figure 2. ITS Strategic Plan Development Process**



## EXISTING AND PLANNED ITS

### EXISTING ITS INFRASTRUCTURE

The existing transportation and ITS infrastructure in the Tideflats area was documented to establish an understanding of the current transportation environment. The locations of signals, conduit and fiber optic networks are shown in **Figure 3**.

**Signal Infrastructure** – A variety of intersection control devices types exist in the Tideflats area. This includes full intersection control through red, yellow and green phases (RYG) along with intersections controlled by flashing red (Flashing R) or red and yellow (Flashing RY). Additionally, signals that only provide pedestrian signalized crossings are noted on the map (Ped Cross). All signals along or near state highways such as SR-99 and SR 509 are under local jurisdiction control. Most of the signals within the Port of Tacoma are owned and managed by the City of Tacoma, with some signals owned and managed by WSDOT and the city of Fife.

**WSDOT ITS** – The current WSDOT ITS infrastructure in the Tideflats includes the following elements:

- Closed-circuit television (CCTV) cameras – Enable surveillance of traffic conditions and incidents
- Highway Advisory Radio Systems (HARS) - Provides a means to disseminate traffic, weather and other advisory information via AM radio frequencies
- Variable Message Signs (VMS) – Provides a means to disseminate traffic advisory messages and travel times to travelers on the freeway
- Ramp Meters – Regulates on-ramp traffic onto the freeway to improve safety and operations by reducing the impact of merging vehicles

**Fiber and Interconnect** – Underground and overhead conduit and fiber optic networks exist throughout the Tideflats. The networks are owned and managed by a variety of agencies, including the Tacoma Fire Department, the City of Tacoma Public Works, and Tacoma Power.

**Port Security CCTV** – The Port of Tacoma Security Department owns and operates a network of cameras throughout the Tideflats area. Specific locations of the cameras are not mapped for security reasons. Many of the cameras are not necessarily fixed on locations to monitor traffic or rail crossing operations, but are utilized for security monitoring and incident response.



**Tacoma Fire Department CAD** – The Tacoma Fire Department utilizes a Computerized Automated Dispatch (CAD) system that includes the locations of all of the response units in real-time in addition to incident location information.

Additional information systems within or near the Tideflats include:

**PierTrucker.com** - The PierTrucker.com website is a third-party resource that provides real-time camera feeds of terminal entrances and WSDOT traffic information.

**WSDOT 511 System** – The 511 Travel Information system supported by the Washington Department of Transportation (WSDOT) provides real-time traffic and road incident information, primarily for the state highway system. Additionally it offers weather forecast information and emergency alert messages.



**Figure 3. Existing Infrastructure**



Note: Due to security concerns, the Port Security camera infrastructure cannot be shown on the map. It encompasses a majority of the Port of Tacoma area

## PLANNED ITS INFRASTRUCTURE

The primary plans and studies that have recommended ITS projects in the Tideflats include the Tideflats Area Transportation Study (TATS), the Port of Tacoma Land Use and Transportation Plan (PLUT) and the WSDOT ITS Plan. Additionally, roadway and railway infrastructure projects such as expansions and reconstructions were also identified in those plans and in the City's Transportation Improvement Programs (TIPs).

Relevant planned ITS infrastructure is identified in **Figure 4**. Primarily this consists of elements from the WSDOT ITS Plan and the Tideflats Area Transportation Study. Other planning efforts did not have specified locations for recommended ITS infrastructure and are described below. A full list of planned transportation projects in the area is included in **Appendix A**.

**Tideflats Area Transportation Study (2011)** – ITS-related projects identified in this study include a general recommendation for variable message signs to be placed within the Port of Tacoma. The plan also identifies intersections that may warrant signalization. Figure 4 also identifies the locations of these intersections.

**Port of Tacoma Land Use and Transportation Plan (2014)** – The Plan contains a number of recommendations, including roadway investments, street design standards, street vacations, and ITS solutions. The ITS strategies recommended in the plan include:

- *Automatic Vehicle Locator System to collect anonymous truck data*
- *Advanced Transportation Management Information System to detect real-time traffic data*
- *Variable Message Signs to communicate delays*
- *Railroad Crossing Monitoring System to detect at-grade railroad blockages*
- *Real-time Information to deliver specific information to trucks as they enter the Port*
- *Reversible Lane Operations to convert lanes during peak periods*

**WSDOT ITS Plan (2013)** – The WSDOT ITS Master Plan identifies goals and future opportunities for an overall ITS system. The plan includes elements adjacent to and within the Port of Tacoma and identifies funding allocations for each ITS project. Figure 4 details the funded and unfunded elements within the WSDOT ITS plan near the Tideflats area. The ITS infrastructure along I-5 is

funded and or completed, while the systems along I-705 and SR-509 are unfunded. The unfunded elements total \$6.8 million per details within the plan.

**Tacoma Transportation Master Plan (Ongoing)** – The draft project list under development for the Transportation Master Plan includes new signals in the Tideflats and will eventually include elements from the ITS Strategic Plan. When this project list is finalized, the ITS Strategic Plan should be updated with the revised project list.

**Tideflats Emergency Response Plan (Ongoing)** – The ITS elements recommended in the Tideflats Emergency Response Plan are consistent with the strategies and infrastructure identified in the ITS Strategic Plan as these two documents were developed in conjunction.

**Viewpoint** – The Viewpoint Command System is a software package that provides a clearinghouse of emergency response information, including fleet locations and incident details. It has the capacity to relay relevant transportation information such as traffic incidents, roadway speeds and railroad crossing closures. This system is pending future deployment.

**Operations Service Center** - In 2014 commissioners from the Port of Seattle and Port of Tacoma developed a plan to form a Northwest Seaport Alliance to unify management of the two ports' marine cargo terminals and related functions. The Northwest Seaport Alliance (NWSA or Alliance) created the Operations Service Center (OSC) to enable the Seaport to coordinate operational oversight and management, to maximize efficiency of the supply chain and provide 'best in class' service delivery and customer care to their customer and Alliance stakeholders.

The planned ITS infrastructure listed in these documents provided a baseline of potential or future ITS strategies for the Tideflats. During the ITS Strategic Plan development process, these plans and studies were utilized to inform the set of ITS projects and the implementation phasing development. This ensured consistency between the Tideflats ITS Strategic Plan and other transportation plans in the area.

Figure 4. Planned ITS Infrastructure





## STAKEHOLDER INPUT AND NEEDS ANALYSIS

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At a Technical Committee meeting in the fall of 2014, the project team distributed surveys to receive input on issues and needs for ITS within the Tideflats and the Port of Tacoma. Additionally, the team conducted interviews with particular stakeholders to gain a better understanding of existing infrastructure and future ITS plans. The following stakeholders provided input:

- Port of Tacoma Administration
- Port of Tacoma Security
- Puget Sound Energy
- Puyallup Tribe
- Tacoma Fire Department
- Tacoma Public Works
- Tacoma Rail
- WSDOT
- Terminal Operators

Survey responses and interview notes are included in **Appendix B**.

## USER NEEDS

Based on the survey results and stakeholder interviews, a set of user needs emerged that represented the collective input from the committee members. The needs were focused around seven ITS areas listed below. **Table 1** details the specific needs identified under these elements.

1. Data Communications
2. Safety
3. Real-time Traffic Management
4. Regional System Management
5. Freight Management
6. Weather Management
7. Traffic Management Evaluation



**Table 1. User Needs for the Tideflats Area**

User Need	
<b>Data Communications</b>	
	Network based on defined standards that allow for management and troubleshooting by signal and IT personnel
<b>Safety</b>	
	Reduce traffic incidents and improve general traffic safety
	Improve emergency response times within the Tideflats
<b>Real-time Traffic Management</b>	
	Reduce congestion (delay) on key travel routes
	Real-time notification of hot spots (incidents, blockages)
	Real-time rail operations information
	Develop and communicate detours for work zones, incidents and road closures
	Receive alerts from public and freight operators about traffic hazards, incidents and heavy congestion
<b>Regional System Management</b>	
	Ability to communicate with WSDOT TMC for freeway conditions
	Ability to communicate with City of Tacoma field devices
	Share Tideflats area traffic information with regional stakeholders
	Ability to share Port CCTV images with other agencies
	Be made aware of alerts / notices distributed by WSDOT, City of Tacoma, City of Fife, etc.
<b>Freight Management</b>	
	Real-time monitoring of gate/facility traffic and queues
	Ability to develop and deploy freight routing information
	Automatically identify frequent street segments used for freight
	Classification of freight delivery vehicles
	Disseminate bridge toll rates, congestion info and road blockages in real-time
<b>Weather Management</b>	
	Collect/disseminate information
<b>Traffic Management - Evaluation</b>	
	Monitor corridor performance in real-time and using historic data
	Collect and store travel data and performance measures



## GOALS AND OBJECTIVES

From the user needs and stakeholder input, the project team developed a set of potential ITS goals that would align with the policies from previously adopted plans, including the City of Tacoma Comprehensive Plan Container Port Element and the Port of Tacoma Strategic Plan. A full list of the goals from these documents is in **Appendix C**.

As shown in **Table 2**, the goals for the ITS Strategic Plan are categorized by two themes: Outcome Goals and Implementation Goals. Outcome Goals are tied to specific results that the ITS Strategic Plan aims to achieve through projects and system management. Implementation Goals focus on the plan development process to ensure successful installation and operation of the system. For each goal, the Technical Committee specified certain objectives to help in developing the ITS strategies and to measure their performance. **Appendix D** contains additional information identifying potential actions specified for each goal and objective.

**Table 2. Goals and Objectives for the ITS Strategic Plan**

Goal	Objectives
<b>Outcome Goals</b>	
Improve public safety	Reduce the number of traffic incidents
	Improve incident and emergency response
Enhance freight mobility and productivity	Minimize delay and provide route guidance
Accommodate growth in an environmentally sustainable manner	Reduce energy use and emissions
<b>Implementation Goals</b>	
Coordinate among agencies	Ensure integrated maintenance and operations of systems
Implement strategically	Leverage existing investments
	Design for scalability

## TIDEFLATS ITS STRATEGIES AND PROJECT DEVELOPMENT

For the purpose of developing a plan for ITS deployment, the following terms were utilized in the ITS Strategic Plan:

**ITS Strategies** – ITS solutions that define a general strategy to address the Strategic Plan goals

*Example: Incident Management*

**ITS Elements** – Specific elements that are part of an ITS Strategy

*Example: Camera infrastructure for an Incident Management strategy*

**ITS Projects** – Specific projects that install or deploy ITS elements that support ITS Strategies

*Example: The installation of cameras at three particular railroad crossings in the Tideflats*

The ITS strategies identified for the Tideflats ITS Strategic Plan are listed in **Table 3** and were based on National ITS Architecture<sup>2</sup> standards. The services in the National ITS Architecture were compared to ITS strategies identified through previous plans and studies in the area. This step ensured that any ITS projects developed through the ITS Strategic Plan would be consistent with prior planning efforts and with national ITS standards.

**Table 3. ITS Strategies and Prior Planning Studies**

ITS Strategy	Previous Plans and Studies				
	TATS	PoT Land Use and Transportation Plan	WSDOT ITS Plan	Tacoma TMP	Tideflats Emergency Response Plan
1 Signal Optimization	●	●		●	●
2 Signal Priority and Pre-emption				●	●
3 Incident Management		●	●		●
4 Tideflats-area "511" service		●	●		
5 Active Lane Management		●			
6 Supporting ITS Infrastructure	●	●	●	●	●

<sup>2</sup> <http://www.iteris.com/itsarch/html/mp/mpindex.htm>

Additionally, the ITS Strategies were evaluated based on how they addressed the goals and objectives of the ITS Strategic Plan. Each strategy needed to address at least two objectives. Understanding how each strategy achieves the plan's objectives guided the ITS project development and phasing plans. **Table 4** highlights the relevant goals and objectives addressed by each ITS Strategy.

**Table 4. ITS Strategies Matched to Relevant Goals and Objectives**

Goal	Objective	ITS Strategy					
		Signal Optimization	Signal Priority and Pre-emption	Incident Management	Tideflats-area "511" service	Active Lane Management	Supporting ITS Infrastructure
Improve public safety	Reduce the number of traffic incidents	●	●	●			●
	Improve incident and emergency response		●	●			●
Enhance freight mobility and productivity	Minimize delay and provide route guidance	●			●	●	●
Accommodate growth in an environmentally sustainable manner	Reduce energy use and emissions	●			●	●	●

On the following pages, each ITS Strategy description provides the relevant goals addressed, the estimated benefits to the transportation system and to agencies, and the requirements and cost considerations. The ITS strategy descriptions also include specific ITS elements that are necessary for deployment of a particular strategy. The later ITS Project Phasing section references the ITS elements listed in these strategies to define the specific projects for implementation.

# 1 | Optimization of Traffic Signal Operations

## ITS Goals Addressed

- Improve public safety
- Enhance freight mobility and productivity
- Accommodate growth in an environmentally sustainable manner

## Description

Update traffic demand information and signal phasing/timing for selected corridors within the Tideflats. Perform engineering analysis to understand current traffic operations. Implement signal timing and phasing modifications.

## Potential Project Benefits

- Signal re-timing may reduce total corridor travel time between 7 to 25 percent
- Coordinated signal timing reduces delay between 5 and 20 percent

## Agency Benefits

- City of Tacoma – Improved traffic operations and reductions in congestion for streets in the Tideflats area
- Port of Tacoma – Overall improvement in freight mobility throughout the Tideflats, increasing the efficiency of freight and container movement for the Port.
- WSDOT – Potential to alleviate any spillback queues onto state facilities such as SR-509 and I-5 with optimized signal timing

## Requirements and Cost Considerations

It is important to implement lower cost solutions such as re-timing and coordination before full-scale adaptive control. High-estimate of costs include contingency for additional signal actuation infrastructure where needed

ITS Elements	Low Investment	High Investment
Signal timing update	\$8,000 per intersection	\$30,000 per intersection
Signal actuation infrastructure	\$60,000 per intersection	\$120,000 per intersection

## 2 | Traffic Signal Priority and Pre-emption

### ITS Goals Addressed

- Improve public safety

### Description

Provide emergency service providers the ability to preempt traffic signals as emergency vehicles approach the intersection. Stop all traffic except for the direction in which the emergency vehicle is approaching. Also allow for lower-level priority for other modes, e.g. transit.

### Potential Project Benefits

- Emergency response times reduced by 15 to 25%
- Travel time savings of between 3 and 10 seconds per intersection on average
- Reduced probability of collisions between emergency responders and general traffic

### Agency Benefits

- City of Tacoma – Reduces likelihood of collisions and improves emergency response times
- Port of Tacoma – Improved response times to areas within the Port
- Pierce Transit – Longer term benefit by allowing future potential transit signal priority treatments within the Port

### Requirements and Cost Considerations

Costs are based on upgrading current signal infrastructure, as all emergency response vehicles in the area are already equipped with the system. Costs can vary based on the number of intersection approaches where priority is provided.

ITS Elements	Low Investment	High Investment
Signal pre-emption upgrade	\$8,000 to \$10,000 per intersection	

## ITS Goals Addressed

### 3 | Incident Management

- Improve public safety

#### Description

Provide emergency responders with real-time incident information as well as information on rail operations, with the goal being to identify key blockages (both from rail and roadway operations) that could impede emergency response. This strategy should leverage the ongoing developments of the Viewpoint System, the South Sound 911 system, and the NW Seaport Alliance Operations Service Center in order to share data between agencies.

#### Potential Project Benefits

- Reduced delay in response times between 1 and 3 minutes depending on blockage location
- Optimized routing that will improve overall emergency response travel time
- Additional information on railroad blockages for freight routing

#### Agency Benefits

- City of Tacoma – Improves response time to incidents in the Port, with potential benefits of reduced delay due to incidents
- Port of Tacoma – Improves emergency response to users in the Port of Tacoma

#### Requirements and Cost Considerations

Lower cost deployment includes manual observation of blockages and incidents using existing traffic cameras at intersections and camera placements at strategic railroad crossings.

ITS Elements	Low Investment	High Investment
PTZ Camera and pole infrastructure	\$30,000 per location	\$42,000 per location
Fiber splice and switching equipment	\$28,000 per location	\$39,000 per location





## ITS Goals Addressed

### 4 | Tideflats-Area 511 Service

#### Description

- Improve public safety
- Enhance freight mobility and productivity
- Accommodate growth in an environmentally sustainable manner

Provide a clearinghouse of transportation information to emergency response and those responsible to transport goods within the Tideflats area. Provide real-time information on roadway facilities that serve the Port of Tacoma and best routing options, primarily for freight users accessing the Port from I-5 and SR 509. Information may be provided via variable message signs, website or mobile-based applications. The service would be a means of determining current status of railroad crossings and rail operations, roadway speeds and delays, incidents and non-recurring congestion, real-time video, port drayage operations, and other alerts. Elements of this strategy may be provided via the continued development of the NW Seaport Alliance Operations Service Center.

#### Potential Project Benefits

- FRATIS projects expected to reduce travel times by 15%, fuel consumption by 5% and freight-involved incidents by 30%. Increase productivity up to 25%
- Savings per drayage trip up to \$200
- Increase in customer satisfaction (up to 90%)

#### Agency Benefits

- City of Tacoma – Improves communication within the Tideflats to travelers in the area
- Port of Tacoma – Provides the ability to disseminate valuable information to Port users to improve drayage and trucking operations
- WSDOT – Implementation through the existing 511 system provides opportunities to leverage Tideflats and WSDOT-based systems

## Requirements and Cost Considerations

The significant costs are in the deployment of infrastructure to collect data, which would be borne by other projects. The 511-system costs would be the staffing and labor needed to manage information dissemination through the system and software development for dissemination tools.

ITS Elements	Low Investment	High Investment
511 Deployment service	Range of total cost is \$1 to \$3 million depending on scale	
GPS probe data	Minimum \$5,000 initial fee with additional per-lane-mile costs	
Vehicle detectors (per location)	\$500 per lane of loops	\$20,000 per intersection for video
Variable Message Signs (per location)	\$20,000 for lightweight	\$200,000 for large sign on structure
Website/Text Information Distribution	Variable costs, range from \$25,000 to \$50,000 depending on scope	

## ITS Goals Addressed

### 5 | Active Lane Management

- Improve public safety
- Enhance freight mobility and productivity
- Accommodate growth in an environmentally sustainable manner

#### Description

Implement fixed or variable modifications to the lane configurations on key arterials (e.g. Port of Tacoma Road) to allow the management of roadway capacity in response to demands of terminal operations. Lane configurations may be preset based on time-of-day or fluctuate based on particular vessel loading schedules.

#### Potential Project Benefits

- On Port of Tacoma Rd, analysis by City of Tacoma showed improved intersection traffic operations with 1 southbound lane in AM period and shift to one northbound lane in PM period
- Analysis in other areas of the country showed a 10 to 22 percent reduction in travel times

#### Agency Benefits

- City of Tacoma – Improves overall operations of Tideflats area roadway operations and provides fire department with clear path of travel during peak congestion periods
- Port of Tacoma – Improves overall congestion related to terminal operations and increases throughput of container movements

#### Requirements and Cost Considerations

Costs range from minimal to relatively high depending on scale of deployment. Will require new signal equipment at intersections and additional signal equipment along corridor if lane configurations will be based on variable time-of-day operations.

ITS Elements	Low Investment	High Investment
PTZ Camera and pole infrastructure	\$30,000 per location	\$42,000 per location
Fiber splice and switching equipment	\$28,000 per location	\$39,000 per location
Lane Configuration signage	\$4,000 per location	\$8,000 per location



## 6 | Provision of Supporting System Infrastructure

### ITS Goals Addressed

- Improve public safety
- Enhance freight mobility and productivity
- Accommodate growth in an environmentally sustainable manner

### Description

Install communications and data collection infrastructure to support the deployment and implementation of elements in the ITS plan. Each strategy requires an expansion or supplementation of the existing ITS infrastructure in the Tideflats area: communications, data collection and information

### Potential Project Benefits

- Provides the necessary backbone to implement a number of projects, rather than piece-by-piece infrastructure installations
- Improves funding opportunities for future projects by providing baseline infrastructure for deployment

### Agency Benefits

- City of Tacoma – Provides baseline infrastructure for future deployment of traffic management system
- Port of Tacoma – Assists in expanding Port Security infrastructure and providing travel time and incident notification to users of the system
- WSDOT – Provides potential to incorporate Port Area infrastructure into state ITS planning efforts

### Requirements and Cost Considerations

Costs depend on deployment scope and existing available infrastructure and are dependent on the exact scale of existing Port Security coverage. WSDOT and Tacoma Fire Department are in discussions regarding existing and planned fiber infrastructure in the Tideflats area.

ITS Elements	Low Investment	High Investment
Fiber splits on Taylor Way for camera locations	\$170,000	\$230,000



Installation/burying of fiber on Port of Tacoma Rd. using newly installed conduit	\$350,000	\$450,000
Burying of overhead fiber and gap filling installation throughout Tideflats	2,200,000	\$2,990,000

## ITS PROJECT PHASING

Deployment of the ITS Strategic Plan involves phasing of specific ITS elements identified from the strategies detailed in the previous section. A full implementation plan should be developed jointly by the participants, taking into account available funding and agreements among stakeholders.

In order to start this process, the project team developed a potential phasing plan for implementing specific projects. The phasing plan shown in **Table 5** includes a reference to the relevant ITS Strategies and is defined by short, mid and long-term projects, which are highlighted in **Figures 5-7**. Short-term projects were identified as those that were necessary to be in place before other projects could be developed or were projects that could be implemented relatively soon and with less cross-agency planning and design as compared to the mid and long-term phasing.

The key short-term projects should include constructing an initial ITS fiber and network infrastructure (Strategy 6) required to share video and data between agencies, while installing cameras at strategic locations for the monitoring of rail crossings and traffic conditions. Other near-term efforts should focus on expanding the current signal preemption locations in the Tideflats and updating signal timing and coordination along primary corridors entering the Port of Tacoma. Medium-term projects include the full development of the Tideflats Advanced Transportation Management System and the completion of the WSDOT ITS plan.

**Table 5. Potential Implementation Phasing for the ITS Strategic Plan**

	Project ID	Description	ITS Strategies	Project in Previous Plans*
Short Term (0-5 years)	S1	Establish agreements / MOU's regarding operation and maintenance of ITS Infrastructure	3,6	
	S2	Construct initial ITS fiber and network Infrastructure needed for basic information sharing among stakeholders	6	PTLT
	S3	Set up Port of Tacoma "Port Traveler Information" website	4	
	S4	Add "Port Travel Information" option to the State's 511 system	4	
	S5	Establish video-sharing between Port, City (Fire, PW, and Rail) and WSDOT	3	PTLT
	S6	Add cameras to key locations including existing at-grade rail crossings	3	PTLT
	S7	Install signal preemption for existing signals on priority corridors	2	CFP**
	S8	Update signal coordination for signals on Pacific Highway and 54th Avenue NE	1	TATS
	S9	Continue development and implementation of the Operations Service Center	3,4	
Mid Term (6-10 years)	M1	Complete remainder of WSDOT ITS infrastructure on I-705 and SR 509	6	WSDOT ITS
	M2	Develop Tideflats Advanced Transportation Management System, linking agency stakeholders, private entities, and the public	All	PTLT
	M3	Design and begin implementation of new traffic signal system for City of Tacoma	1,2	CFP**
	M4	Evaluate feasibility of Variable Message Signage at rebuilt Port of Tacoma Road interchange	4	PTLT, TATS
	M5	Update signal coordination along Port of Tacoma Road as part of the interchange modification, and implement preferred lane management program along Port of Tacoma Road	1,5	PTLT, TATS
Long Term (10+ years)	L1	Implement adaptive traffic signal control system	1	CFP**
	L2	Continue maintenance and integration of Advanced Transportation Management System	All	PTLT

Note: Only projects with specific locations are included on the maps on the following pages.

\*PTLT – Port of Tacoma Land Use and Transportation Plan. WSDOT ITS – Washington State DOT ITS Master Plan. TATS – Tideflats Area Transportation Study

\*\*The signal projects are not specifically identified, but are defined as "signal replacement and upgrades" in the CFP (City of Tacoma Capital Facilities Plan)



Figure 5. Short-term ITS Projects

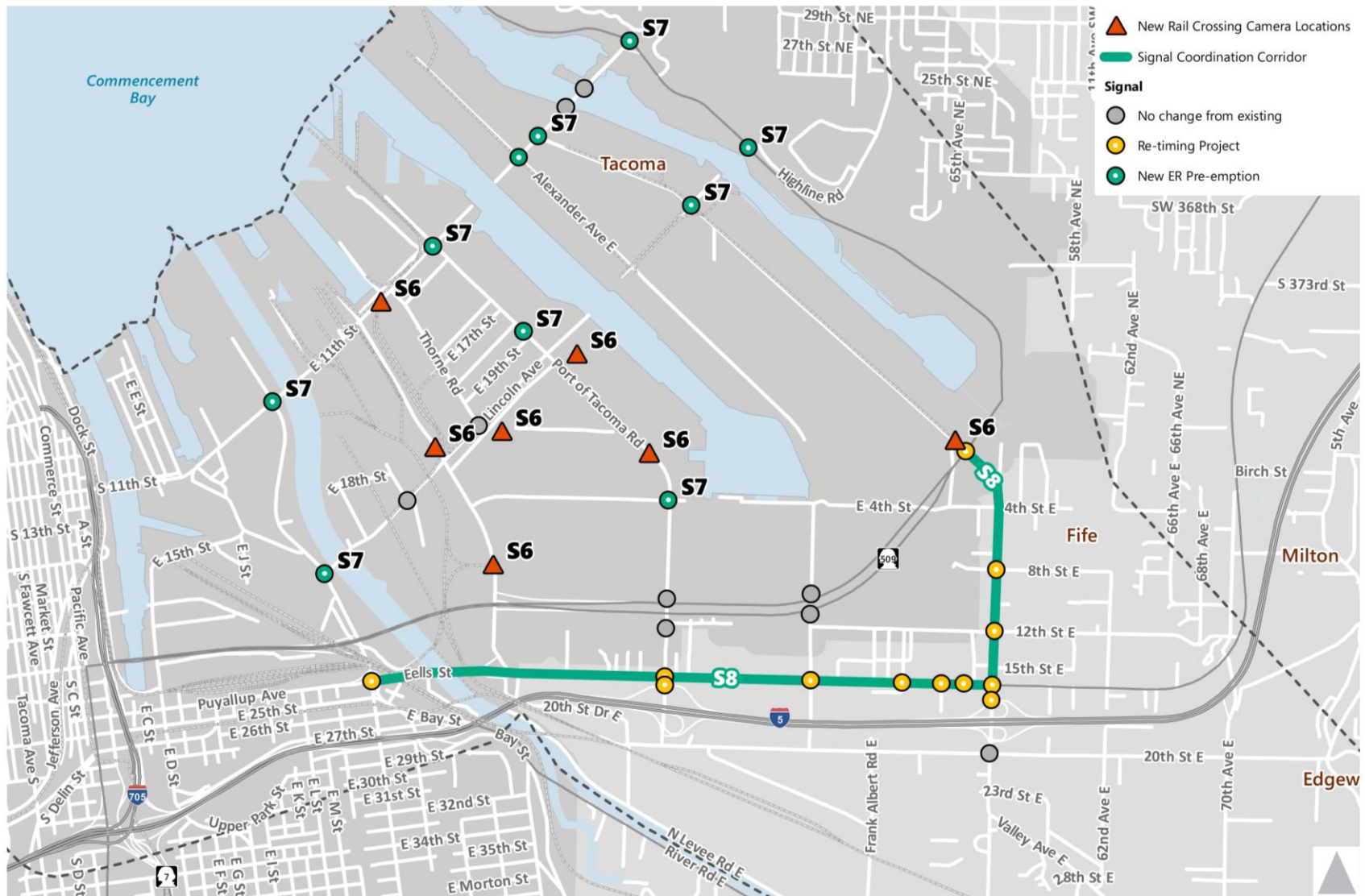
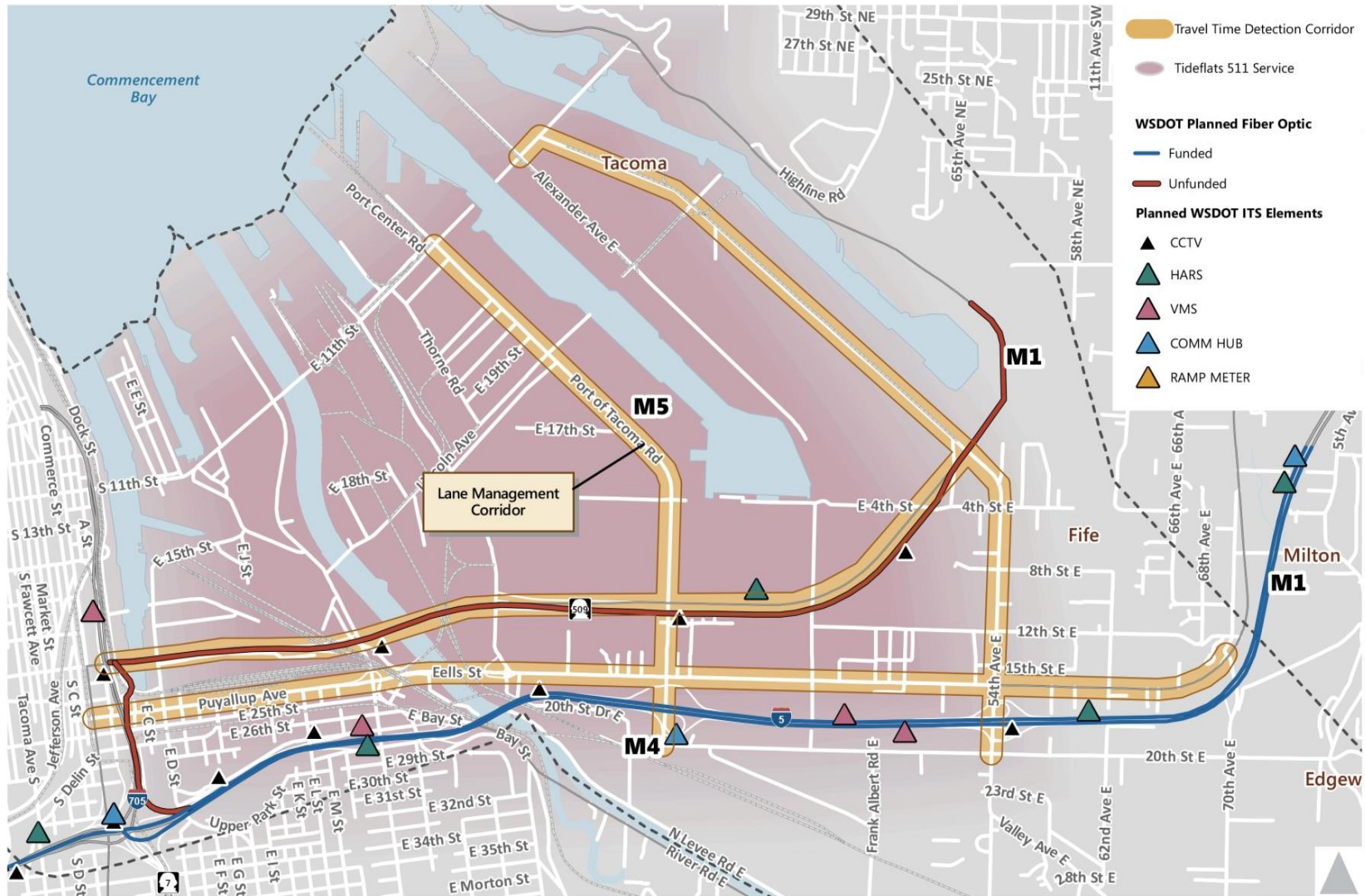
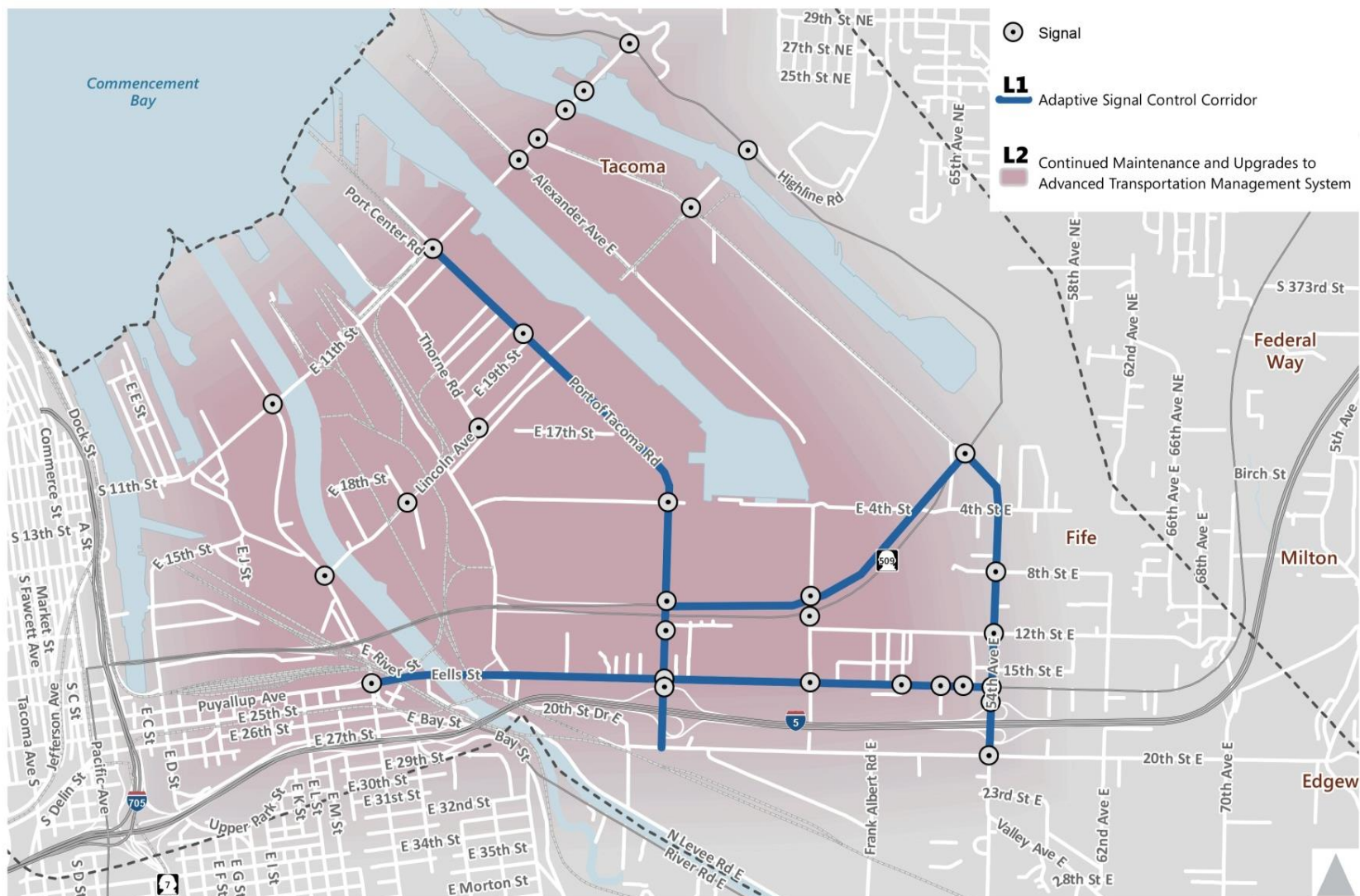


Figure 6. Medium-term ITS Projects





### Figure 7. Long-term ITS Projects



## NEXT STEPS

### CONCEPT OF OPERATIONS

A Concept of Operations (ConOps) for an ITS defines the scope of the system, the users' perspectives and how stakeholders are involved in the operation and management of the system. Additionally, a ConOps describes the nature of the system using hypothetical scenarios. **Figure 8** provides a conceptual view of the flow of information within the Tideflats ITS and identifies the various systems that will allow for the transfer of information. The key component is the Tideflats Transportation Management System (TTMS). The TTMS may utilize a cloud-based system to store and manage the flow of information, or it may be a physical transportation management center that coordinates the entirety of the Tideflats ITS. The continued development of the NW Seaport Alliance Operations Service Center may provide an opportunity to establish itself as the primary management center for the Tideflats ITS. The diagram in Figure 8 can serve as a starting point to identify the roles and responsibilities that will be developed as part of the Tideflats ITS ConOps.

Initial steps to develop a Tideflats ITS ConOps have been completed through the ITS Strategic Plan, including the following:

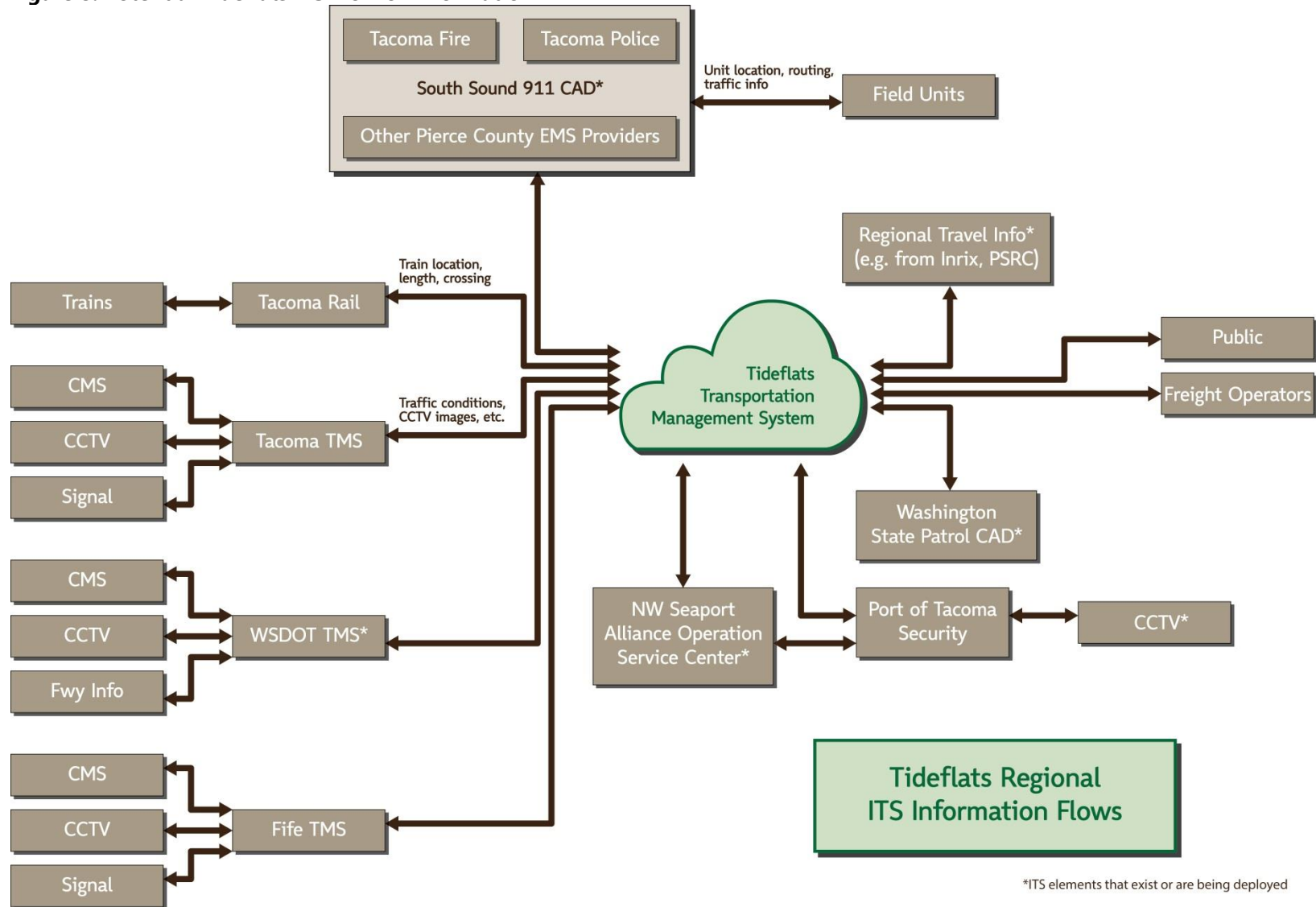
1. Describe the objectives of the system
2. Describe the components of the system (ex. traveler information, video-sharing, etc.)

Remaining steps for the development of a ConOps include the following:

3. Describe the operation of each of ITS strategy, in general and through illustrative scenarios
4. Describe who would be involved in operating and maintaining various elements of the system
5. Identify final costs and benefits for deploying and operating those elements



Figure 8. Potential Tideflats ITS Flow of Information



## AGREEMENTS

Identifying and implementing the necessary agency agreements is a critical process element in realizing the integration of the Tideflats ITS architecture shown in Figure 8. Each connection between architecture elements represents cooperation among the project partners and could potentially require an agreement. The partner agencies in the Tideflats ITS program will need to determine the number of agreements and the level of formality and structure of needed each agreement. It may be possible to extend already existing agreements, or to develop a single Memorandum of Agreement (MOU) that can support all identified interfaces. Experience from similar efforts throughout the country has shown that developing the necessary agreement(s) can take a long time. It is prudent to begin the process of identifying and developing the necessary agreements early, and to ensure that all agencies and potentially, private sector partners, are aware of the status of the process. **Appendix E** provides an overview of the process typically used in identifying the necessary agreements.

As a concurrent and more formalized step in the ConOps development, an initial Memorandum of Understanding (MOU) should be drafted to outline the coordination expected between agencies. The MOU should outline the general purpose of the collaboration as it pertains to the ITS plan and may be modified as details of the ConOps are finalized. An MOU may consist of a number of elements and can encompass a range of detail, from defining a general agreement of the system to detailing a specified set of requirements.

Elements that are common in an initial MOU for ITS planning include:

- Identify a lead agency
- Define the operational goals and objectives
- Describe the organizational structure of the partner agencies
- Describe the roles and responsibilities
- Identify the scope of coordination (specific arterials, signals, areas of the Port, etc.)
- Specify the timeline of the MOU and the process for renewal

Funding requirements and cost-sharing arrangements may be defined in the MOU or through a separate funding agreement. Additionally, an initial MOU is not meant to describe specifically how the ITS strategies will be operated. That level of detail is defined in the ConOps and through standard operating procedures and agreements.





A stakeholders group consisting primarily of the key partners involved in data sharing should be formed to develop the initial MOU and the ConOps and identify other agreements that may be necessary as the program progresses. This “ITS Partnership” may consist of representatives from the City of Tacoma, the Port of Tacoma, the Tacoma Fire Department and WSDOT among others. To date, informal discussions between certain agencies have identified the need to share video and improve overall communications.

## IMPLEMENTATION PLAN

With roles and responsibilities identified through the ConOps development and detailed in the MOU, the stakeholder team can develop an ITS implementation plan. An ITS implementation plan describes the specific steps needed to design, fund and deploy the ITS elements and it incorporates the following actions:

1. Finalize specific ITS projects tied to the ITS Strategies and the ConOps. **Table 6** provides an initial list of specific short-term ITS projects and their estimated costs.
2. Complete a more detailed prioritization of the projects to determine feasibility and funding opportunities for near-term projects.
3. With finalization of near-term projects, begin final design of the project elements.

The Implementation Plan should be evaluated based on its ability to address the key implementation objectives identified in the ITS Strategic Plan; as follows:

1. Ensure integrated maintenance and operations of systems
2. Leverage existing investments
3. Design for scalability

The ITS Implementation Plan should be reviewed every one to two years to add or delete projects as priorities and conditions change throughout the process. Elements in the ITS Strategic Plan should remain consistent with other planning efforts, such as the City of Tacoma Transportation Master Plan, the WSDOT ITS Plan and the Tideflats Emergency Response Plan.

**Table 6. Short-term ITS Project Cost Estimates**

ITS Element	Project ID	Cost Range	Notes on Deployment
Construct initial ITS Infrastructure needed for basic information sharing among stakeholders	S2	<p>\$150,000 - \$230,000</p> <p>\$775,000 - \$1,050,000**</p> <p>\$2,200,000 - \$2,990,000**</p>	<p>Costs will vary depending on scope and need once gaps in the Port Security network are identified. Low-range estimate assumes only the costs to splice/pull the fiber needed along Taylor Way for strategic camera placements. Assumes the use of existing city-owned overhead fiber cable along Taylor Way.</p> <p>Medium-range cost based on installing fiber along Alexander Avenue to close gap in TFD/City fiber network on Blair Hylebos Peninsula. Includes low-end estimate costs.</p> <p>High-range estimate involves major fiber construction where gaps exist and where overhead fiber would be buried. It is meant to represent the most conservative estimate for ITS fiber needs. Includes burying overhead fiber along Taylor and all medium-range estimate costs from above.</p>
Establish video-sharing between Port, City (Fire, PW, and Rail) and WSDOT	S5	Minimal cost based on MOUs	Port Security is capable of sharing video via IP address with secure login information. TFD and WSDOT currently share video and can leverage the future Viewpoint system as a means of hosting a collective platform for video sharing. Cost of Viewpoint is already assumed as part of the software contract with TFD.
Add cameras to key existing at-grade rail crossings	S6	\$260,000 to \$350,000	Fixed cameras on poles at up to seven high volume crossing locations identified by TFD and Tacoma Rail. Required amount may be reduced based on Port Security camera locations, ability to share current poles, and possible relocation of existing cameras.
Install signal preemption for existing signals on priority corridors	S7	\$65,000 to \$150,000	Range of 6 to 10 total signals updated with preemption along Emergency Response Corridors within the Tideflats.
Update signal coordination for signals on Pacific Highway	S8	\$99,000 to \$135,000*	9 total signals re-timed and coordinated between 54 <sup>th</sup> Avenue and E Portland Avenue including the two ramp terminal signals off of Port of Tacoma Rd and 54 <sup>th</sup> Avenue due to coordination requirements.
Update signal coordination for signals on 54th Avenue	S8	\$55,000 to \$75,000*	5 total signals re-timed and coordinated between I-5 and SR509.

ITS Element	Project ID	Cost Range	Notes on Deployment
ITS Coordinator	-	1 FTE	Based on final deployment level of ITS elements and the need between agencies for coordination.

\*Note that the signals at 54<sup>th</sup> Avenue/SR99 and 54<sup>th</sup> Avenue/I-5 off-ramps are included in both the Pacific Highway and the 54<sup>th</sup> Avenue signal coordination cost elements

\*\*Costs for ITS fiber infrastructure are additive. The medium-range estimate includes the elements in the low-range and the high-end estimate includes the low and medium-range cost elements

## Appendix A. Planned Transportation Projects in Tideflats Area

### Project Source Key:

STIP – Washington State Transportation Improvement Plan, 2014

TATS – Tideflats Area Transportation Study, 2011

PTLT – Port of Tacoma Land Use and Transportation Plan, 2014

TIP – Tacoma or Fife Transportation Improvement Programs, 2014

ID	Project Name	Project Description	Sources of Project
1	Port of Tacoma Rd Interchange - Phase 1	Purchase ROW and construct new SB off-ramp from I-5. Wetlands mitigation is the only construction funded part of this stage. Will also include truck route along 34th Ave and 12th Street to PoT Road	STIP, TATS, PTLT
2	Pacific Hwy / 54th Ave Intersection Improvement	2nd WB left-turn lane	TIP
3	20th St E - Expansion	5 lane profile from 50th to 54th Avenue	TIP
4	20th St E - Reconstruct	Bike lanes/SW add from 59th Ave E to 70th Ave E. New signal at 62nd Ave E	TIP
5	54th Interchange / I-5	Rebuild interchange and intersections from Pacific Hwy to 20th St E	TIP, TATS
6	Valley Ave E reconstruction	54th Ave E to Brookville Gardens. Widen to 3-lanes with roundabouts at 58th and 62nd Ave E	TIP
7	54th Ave E - Grade separation	Separation at UPRR	TIP, TATS
10	70th Ave E - Reconstruction	Reconstruct 4-lane from 20th St E to Pacific Hwy E. Replace the I-5 bridge	TIP, TATS
11	52nd Ave E - New Road	New road from Pacific Hwy to 12th E	TIP
12	70th Ave E - RR overpass	Construct an overpass structure above UPRR	TIP, TATS
13	70th Ave E - Expansion	Reconstruct to 5-lane section from N Levee R to 43rd St E. Mostly developer funded	TIP
14	Extension of 59th Ave E	Pacific Hwy E to 12th St E extension. Funded by Tribe	<b>Completed 2012</b>
15	N Levee Rd - Expansion	3-lane expansion from 54th Ave to Freeman Rd. Is broken into 3 segments (54th Ave/70th Ave cut points)	TIP, TATS
16	Frank Albert Rd Overcrossing I-5	Extend Frank Albert Rd from 20th St E to Pacific Hwy	TIP, TATS
18	20th St E and Industry Dr	New Signal	TIP
19	48th St E - Expansion	3-lane expansion and signalization. Largely developer funded from 70th Ave E to Freeman Rd	TIP

<b>20</b>	12th St E - Expansion	From 62nd Ave to Alexander Ave. 3-lane roadway	TIP, TATS
<b>22</b>	20th St E - Expansion	70th Ave E to Freeman Rd. E. 3-lane roadway with bike lanes	TIP
<b>23</b>	62nd Ave E - Expansion - North Segment	3-lane roadway from Pacific Hwy to 12th St E	TIP, TATS
<b>24</b>	20th St E / 58th Ave E	New Signal	TIP
<b>25</b>	62nd Ave E Overpass	Extend 62nd Ave E from 20th St E to Pacific Hwy.	TIP, TATS
<b>26</b>	New Connector Arterial @ 32ND Street E - 54th Ave E to Frank Albert Rd	3-lane roadway. Tribal funded	TIP
<b>27</b>	12th St E - Extension	3-lane extension from Alexander Ave to 34th Ave E	TIP, TATS
<b>28</b>	66th Ave E - New road	From 20th St E to 26th St E. Developer funded	TIP
<b>29</b>	20th St E - Expansion	3-lane from Industry Dr to 34th Ave E	TIP
<b>30</b>	SR-509 / D Street Slip ramps	The project will construct a half diamond interchange at East D Street and SR-509. An interchange justification report (IJR) is required for approval of the added access to SR-509. The project includes public/private partnerships that are developing. Awaiting WSDOT confirmation of IJR	TIP
<b>31</b>	Lincoln Ave / Port of Tacoma Rd - New signal	This project will install a new traffic signal or other traffic control device at this intersection. Additional funding is required.	TATS
<b>32</b>	E 11th St Viaduct – Retrofit or Rebuild	Rebuild or retrofit viaduct. Examine combination of at-grade + bridge and full viaduct options	TATS
<b>33</b>	Puyallup Ave Bridge - Rebuild	Rebuild for removal of weight restrictions and expansion of lane capacity	TIP, TATS
<b>34</b>	Extend A/D Rail Line	Extend the line across Alexander Ave to Taylor Ave. Port is planning to increase arrival/departure train lengths from 8,000 to 10,000 feet	TATS
<b>35</b>	Freeman Rd - Expansion	3-lane profile from River Rd to 20th St E	TATS
<b>36</b>	SR-167 Extension Phase 1	Tolled extension of SR-167 to SR-509	TATS, PTLT
<b>37</b>	Add HOV Lanes on I-5 from SR-16 to Federal Way	Two-way HOV lanes	STIP, TATS
<b>38</b>	Valley Ave - Expansion	Widen to 4 lanes and widen east approach	TATS

<b>39</b>	11th Street East Corridor Improvements	This project is recommended by the East Foss Transportation Study. It calls for a redesign of the East 11th Street corridor from the Murray Morgan bridge to the Puyallup River. It also includes improvements to the St. Paul and F Street intersection. As of 2013, this project is NOT fully funded. The unmet funding need will be determined during the design phase.	TIP
<b>40</b>	SR 509, Taylor Way, & 54th Ave Improvement	This project includes intersection improvements as identified by Blair Hylebos Terminal Redevelopment Plan (BHTRP), SSA/Puyallup Tribal Terminal, and Tideflats Area Transportation Study (TATS). Anticipated developer funding includes \$4.8M. As of 2012, this project is NOT fully funded.	TIP, TATS
<b>41</b>	Puyallup Avenue Road Diet	The Puyallup Avenue project scope includes Pacific Avenue to Portland Avenue. The new road will be designed to lessen pavement, add facilities for active lifestyles (such as bike lanes), rain gardens, and other boulevard	TIP
<b>42</b>	I-5 Variable message signs into Port	ITS VMS strategies for Port access	TATS
<b>43</b>	Canyon Rd Extension	Pioneer Way across river to 70th Ave E	TATS
<b>44</b>	I-5 - CD lanes	54th Ave to Port of Tacoma Rd	TATS
<b>45</b>	Milwaukee Way / Marshall St	New signal	TATS
<b>46</b>	St Paul Avenue/ E 11th Street intersection	Construct signal or roundabout	TATS
<b>47</b>	St Paul Avenue/ Portland Avenue intersection	Construct signal	TATS
<b>49</b>	Portland Avenue/Puyallup Avenue intersection	Widen intersection with additional left turn/through lanes	TATS
<b>50</b>	S 26th Street/I-705 northbound off-ramp intersection	Add signal	TATS
<b>51</b>	Portland Avenue on and off ramps at SR 509	Add traffic signals and modify channelization	TATS
<b>52</b>	54th Avenue E/4th Street	Add signal	TATS
<b>53</b>	54th Avenue E/12th Street E intersection	Create an eight-phase signal operation with protected left turns	TATS

54	54th Avenue E/20th Street E intersection	Widen approach legs and rechannelize	TATS
55	Portland Avenue/25th and 26th Streets	Add traffic signals	TATS
56	Frank Albert Rd - Expansion	From Pacific Hwy to 12th St E	TATS
57	E D St / Puyallup Ave	Change signal phasing and add left turn pocket to SB approach	TATS
58	Pacific Ave / 13th St	Restripe EB RT lane as shared TH/RT	TATS
59	Pacific Ave / Tacoma Way / 26th St	Restripe EB RT lane as shared TH/RT	TATS
60	Milwaukee Way Street vacation	Based on development	PTLT
61	Port of Tacoma Road Rehab	Grant-funded for surface rehab	PTLT
62	Thorne Rd - Heavy Haul Improvements	Surface rehab	PTLT
63	Marshall Ave/ Port of Tacoma Rd	Add signal	PTLT
64	Maxwell Ave Street Vacation	Based on development	PTLT
66	Alexander Ave Street Vacation	Based on development	PTLT
68	Transfer Yard Connection to Lincoln	New crossing required	PTLT
69	West End Yard Reconfiguration	Would add a 3rd at-grade crossing on Milwaukee Way	PTLT
70	Washington United Terminal - Double Ending	New at-grade crossing across Port of Tacoma Rd	PTLT
71	Pierce County Terminal - Double Ending	New at-grade crossing on Alexander Ave east of PC Terminal	PTLT
72	Lincoln Avenue "wye" installation	Fire access could be affected by the new track under the Lincoln Ave. Bridge	PTLT
73	At-grade crossing of SR-509 near Alexander Ave	Upgrading existing crossing system to cantilevered structure over NB lanes. Wiring upgrade for SB lanes. Exempt signage to be installed to allow school buses and hazmat vehicles to pass if there is not signal to stop	PTLT





## **Appendix B. Survey Responses and Stakeholder Input**

## **Appendix C. Goals from Previously Adopted Plans**

### **Port of Tacoma Strategic Plan, 2012**

1. Enhance the Port's Competitive Position
2. Provide Reliability and Efficient Regional and Local Infrastructure Connections
3. Improve the Port's Financial Performance
4. Increase Organizational Capabilities
5. Advance Environmental Stewardship
6. Strengthen the Port's Community Connections

### **City of Tacoma Comprehensive Plan – Container Port Element, 2014**

**Core Area Goal** – Identify the core port and port-related container industrial area and protect the long-term function and viability of this area.

**Industrial/Commercial Buffer Area Goal** – Establish an Industrial/Commercial Buffer area around the Core Area that will protect the continued viability of the Core Area while providing for a compatible Industrial/Commercial Buffer to development in the larger surrounding area.

**Economic Development Goal** – Promote the continued growth and vitality of port and port-related industrial activity.

**Environment Goal** – Work in partnership with the Port of Tacoma and other property owners to promote protection, restoration and enhancement of native vegetative cover, waterways, wetlands and buffers.

**Capital Facilities** – Provide, protect and preserve the capital facilities and essential public service needed to support activities within and beyond the Core Area.

**Transportation** – Identify, protect and preserve the transportation infrastructure and services needed for efficient multimodal movement of goods within and between the Core Area, Industrial/Commercial Buffer Area, and the regional transportation system.

## Appendix D. Goals, Objectives and Potential Actions for the Tideflats ITS

Goal	Objectives	Potential Actions
<b>Outcome Goals</b>		
Improve public safety	Reduce the number of traffic incidents	Reduce potential traffic conflicts through improved signal operations or roadway configurations
	Improve incident and emergency response	Establish direct communication link between all elements of emergency response
		Provide real-time traffic conditions and rail operations information to emergency response providers
Enhance freight mobility and productivity	Minimize delay and provide route guidance	Provide real-time monitoring of sources of travel delay
		Automatically share traffic information with users
		Optimize traffic flow to reduce delays along key corridors
		Provide traveler information to enable improved trip-making decision
		Establish formal communication between roads and rail
		Provide real-time monitoring of gate/facility traffic and queues
Accommodate growth in an environmentally sustainable manner	Reduce energy use and emissions	Upgrade systems to reduce vehicle delay and idling
		Improve roadway network to reduce circuitous travel

Goal	Objectives	Potential Actions
Implementation Goals		
Coordinate among agencies	Ensure integrated maintenance and operations of systems	Identify roles and responsibilities for operations and maintenance of ITS infrastructure
		Automatically share Tideflats area traffic information with regional stakeholders
		Integrate within regional ITS Architecture and the WSDOT ITS Strategic Plan
Implement strategically	Leverage existing investments	Identify corridors where infrastructure is deployed
		Share data and video where appropriate
		Implement according to current ITS standards and Federal Rulemaking
	Design for scalability	Identify high, medium and low-priority areas for future funding allocations
		Identify implementation phases tied to priorities
		Identify funding strategies

## Appendix E. Agency Agreement Process

### **PROCESS - Key Activities**

#### Prepare

- Research each agency's records to determine if there are agreements in place that can be amended to include specific ITS operations.

#### Create List of Agreements

- Whenever possible, utilize existing standard agreements for operations, integration, funding, etc.
- Evaluate what kind of agreement is needed and build consensus with each of the stakeholders involved:
- Handshake Agreement
- Memorandum of Understanding
- Interagency Agreements
- Intergovernmental Agreements
- Operational Agreements
- Funding Agreement w/ project scope and operations.

#### Build Consensus

- Agreements take a long time to execute. Build consensus early with simple agreements like MOUs while final agreements are being developed.

### **INPUT - Sources of Information**

- Existing operational, intergovernmental, interagency and/or funding agreements between ITS element operating and user stakeholders.
- Existing process and procedures for executing agreements between agencies.
- Operational concept, interconnects, and project sequencing outputs from the regional ITS architecture.

### **OUTPUT - Results of Process**

- A list of agreements (existing and new) required for operations, including those affecting ITS project interoperability.

Source: Regional ITS Architecture Guidance: Developing, Using, and Maintaining an ITS Architecture for your Region, FHWA, 2006.



