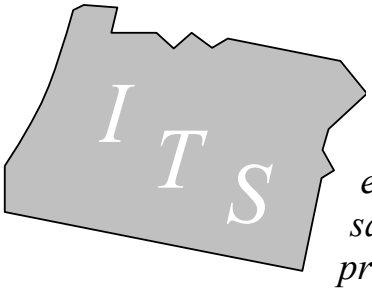
Intelligent Transportation Systems



The vision of ITS in Oregon is to adopt systems, technologies and partnerships that enhance the mobility, transportation efficiency, safety, productivity and to promote economic prosperity and livability.

.

What is ITS and what can it do for Oregon?

The commute in Portland is proceeding normally on a rainy winter evening in the year 2004; as normal as it gets when the road system is handling much more traffic than it was designed for. The Portland freeway system has not added new lanes in many years. At 5:45 PM, a multi-car accident on I-5 near the Terwilliger curves threatens to back up traffic for miles, with hours of delay for motorists on their way home from work. But the region has made not ignored its freeway system; it has invested in an incident response system. The accident is immediately detected by sensors designed to measure traffic speed and is confirmed by closed circuit TV cameras mounted along the freeway. The traffic management center in Portland immediately dispatches emergency response vehicles to the location. The accident is reached within minutes. Several people are seriously injured, but the quick dispatch of medical help gets the victims to the closest hospital before the situation becomes life-threatening. The accident is cleared, and the evening traffic flow is back to normal in half the time it would take without the incident management system.

On that same evening on a stretch of I-84 near Ontario, a temperature and moisture-sensing device in the pavement detects the formation of ice. This information is received at the management center in La Grande, which relays the news on the local cable television and radio station. Many travelers delay their trip to avoid the hazardous conditions. Maintenance crews are dispatched to the area to apply de-icing chemicals while they can be most effective. One motorist, unaware of the danger, slides off the road. The car is equipped with a mayday communication system that relays the vehicle location to the center in La Grande. The quick detection and response to the accident is credited with saving the motorist's life.

Down in Medford that evening, the arterial street traffic is flowing well. Just a few years before, the huge increases in traffic had choked the city streets. But then Medford invested in a new traffic signal system, tying all of the city's signals together and using digital video signals from cameras mounted at the intersections to detect vehicles and minimize "wasted" green light time. Vehicle stops were reduced by 30%, vehicle speeds increased to the posted limits, and travel times fell by 40%. Even the number of accidents fell, while fuel consumption and emissions fell by 7%.

In Eugene, the bus serving the 12th street route is packed with commuters. The local transit system has been gaining market share for several years because of improved service. The bus is detected as it approaches signalized intersections by an antenna mounted along the street. The signal is about to turn red, but the green time is extended for a few seconds to allow the bus to proceed through the intersection without stopping. Traffic crossing 12th do not notice the few seconds that it takes for their signal to turn green, but they have noticed that traffic flow and their commute time home seem shorter than it used to be.

These scenes describe the ways that proven technologies will change the way that Oregonians travel in the near future. Intelligent Transportation Systems, or ITS, is the use of advanced communication and other technologies to make surface transportation safer and more efficient. These technologies are already in use around the world and in Oregon. ITS will provide enormous benefits to travelers while helping to maintain the high quality of life that we enjoy here. Where ITS has been deployed around the world, it has:

- **Reduced travel time by up to 48%**
- **Reduced vehicle stops by up to 35%**
- **Reduced delay by up to 37%**
- **Reduced accidents by up to 35%**
- **Reduced accident clearance time by up to 8 minutes**
- **Reduced accident fatalities by up to 10%**
- **Reduced vehicle emissions by up to 13%**

ITS is not only beneficial to travelers, but it is much more cost effective for transportation agencies than traditional ways of dealing with transportation problems, such as adding lanes.

- **Ramp metering installations report increases in vehicle throughput of 8% - 22% with steady or increasing travel speeds.**
- **An evaluation of Seattle's traffic management system showed growth in traffic of 10% to 100% along various segments of I-5 while speeds have remained steady or increased up to 20%.**
- **The use of weigh-in-motion to allow trucks to bypass weigh stations allows the state to cope with increasing truck traffic volumes without the costly expansion of weigh stations and adding additional personnel.**

The following pages describe a strategy for bringing these benefits to Oregon.

Background and Introduction

Oregon has undergone major growth in population and businesses in the past decade. The resulting demands on the transportation infrastructure are also growing at a very rapid pace. According to a study by ODOT, from 1990 to 1995, Oregon has spent over $4 billion on Highway Fund Expenditures.[1] The same study indicates that about $2.4 billion is budgeted for 1996 to 1998. However, even at this level of expenditure, the State and local agencies are merely able to maintain the existing highway system, with very little budget for expanding the highway to serve expanding needs of the growing state. At the same time, the cost and environmental impacts of building new highways is increasing.

Intelligent Transportation System (ITS) is a national initiative to better manage the demands on our highway network and maximizing the efficiency of our transportation capital investment. It involves the application of advanced technology to solve transportation problems, to provide services to travelers, and to assist transportation system operators in implementing the most effective traffic management strategies to meet actual highway conditions.

The Oregon Statewide ITS Strategic Plan is intended to guide the deployment of ITS in Oregon over the next 20 years. ITS requires partnership among various public and private entities. Through a process involving public agencies and private sector stakeholders, this plan has been developed based on the transportation needs of Oregon. It serves as a roadmap to implement suitable technology, infrastructure and services to promote transportation efficiency, mobility and reduce traffic congestion.

This Strategic Plan Executive Report sets forth the following:

- Vision and goals for ITS in Oregon.
- Existing ITS infrastructure.
- High priority user services for Oregon
- ITS implementation strategy
- Capital, operation and maintenance, and staffing costs, and implementation timeframe.

The Strategic Plan calls for forming partnerships to implement ITS. This can be in the form of public-public partnerships and public-private partnerships. The success of ITS in Oregon requires strong support from policy level to the working level.

[1] Source: 1996 County Study: Allocation of Federal and State Highway Expenditures and Revenues by County and Region.

Vision and Goals

The vision of ITS in Oregon is to adopt systems, technologies and partnerships that enhance mobility, transportation efficiency, safety, productivity and to promote economic prosperity and livability.

The goals of implementing ITS in Oregon are to:

- Improve productivity of the transportation system users;
- Improve safety;
- Improve efficiency of the transportation system;
- Improve mobility and accessibility;
- Improve intermodal connections;
- Promote environmental responsibility and reduce energy use;
- Promote economic development in Oregon;
- Utilize technology as an asset of the transportation system.

ITS can address the current and future needs of the transportation system in Oregon by:

- ✓ Allowing for **better management of transportation supply and demand:** Transportation system managers are able to respond immediately to operational needs.

- ✓ Promoting the **use of alternative modes and connectivity** across the different modes: Improved traveler information gives users better understanding of their choice and options.

- ✓ Increasing **travel efficiency and mobility** without increasing the physical size of the transportation facility: Use of technology to manage highways and transit results in getting the most out of transportation capital.

- ✓ Enabling travelers to **choose travel time, mode, and route efficiently** based on real-time roadway and transit status information: Travelers are provided with better and current information and choices regarding traveling.

- ✓ Reducing the **cost of operating and maintaining** transportation facilities and services: Public sectors can save significant amount of operating and maintenance costs by using products that equipped with newer technology and better reliability.

- ✓ Providing **increased safety and security to travelers**: Reduction in time to response and clear incidents as well as closed circuit television surveillance significantly improves safety.

Existing ITS Infrastructure

ITS is not a new concept. Many transportation and law enforcement agencies, locally-based trucking firms, manufacturers and media outlets in Oregon have implemented different forms of ITS for many years. However, the investment and coordination have not been strategically responsive to statewide needs. The overall benefits therefore become limited. Some of the existing ITS infrastructure includes:

- ODOT Region 1 (Portland) operates in its Traffic Management Operations Center (TMOC) 50 ramp meters, 8 variable message signs (VMS), 10 closed-circuit TV (CCTV) cameras, and *77 cellular call-in for incidents.

- The City of Portland has been operating a centralized traffic signal control system called Series 2000 for over 10 years. It controls 450 of the 950 signalized intersections in a Traffic Operations Center. It also operates 7 CCTV cameras, 30 inductive loop detection systems, and 8 VMS. The City has a Transportation Web Page, with 22 local radio and television stations receiving information from Metro Traffic Control.

- The City of Salem has 78 of the 160 traffic signals being interconnected, with a fiber-optic communications intertie.

- The City of Medford has variable message signs and surveillance cameras.

- ODOT Region 4 operates remote weather stations, video cameras, BBS/Internet public information system, news media paging system, and combined ODOT/OSP dispatching.

- ODOT Region 5 operates VMS's and a radio system for weather conditions.

- In the Portland Metropolitan area, ODOT operates a roving patrol named COMET to improve incident management and response.

- TRI-MET has implemented a vehicle location system on all its buses. This system allows TRI-MET to know where its buses are in the system and facilitates more efficient dispatch and provides real-time bus arrival information to passengers.

- ODOT has implemented a Commercial Vehicle Operation project code-named GREENLIGHT, which uses technology to speed the paper work and inspection process of trucks.

These represent a portion of the ITS infrastructure that public agencies in Oregon have already invested in. This Strategic Plan builds upon this infrastructure.

ITS User Services

The Federal Highway Administration has organized the ITS users services into 30 categories. Through a workshop involving the Steering and Technical Committees, the following are identified as "High Priority User Services" for Oregon:

- Incident Management -- Helps public and private organizations quickly identify incidents and implement a response to minimize their effects on traffic.

- En-route Driver Information – Provides driver advisories and in-vehicle information during travel regarding system operation and transportation choices.

- Traffic Control -- Manages the movement of traffic on streets and highways utilizing technology for better coordination of traffic signals and ramp meters.

- Route Guidance – Provides travelers with simple instructions on how to best reach their destination, including features such as changeable message signs and highway advisory radio.

- Commercial Vehicle Electronic Clearance – Facilitates ports-of-entries clearance, minimizing stops, and reduces paper work.

- Pre-trip Travel Information – Provides information for selecting the best transportation mode, departure time and route.

- Public Transportation Management – Automates operations, planning and management functions of public transit systems.

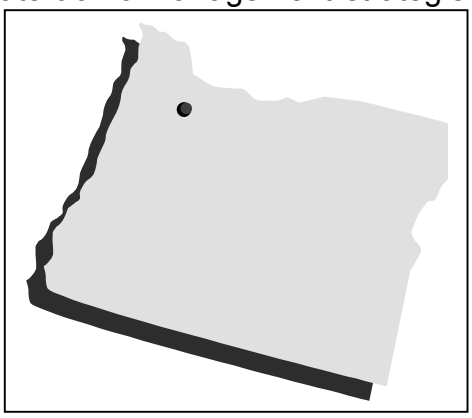
- Emergency Notification and Personal Security – Provides immediate notification of an incident and an immediate request for assistance.

- Emergency Vehicle Management -- Reduces the time it takes emergency vehicles to respond to an incident.

- Commercial Fleet Management – Provides communication between drivers, dispatchers and intermodal transportation providers.

ITS Implementation Plan

The implementation of ITS in Oregon is classified by regions. Each region will operate a Regional Traffic Management Center (TMC) whose functions are to operate and maintain ITS, and to coordinate traffic management strategies with other agencies in the region. Five Regional TMCs are defined:



Portland TMC Salem TMC

Medford TMC Bend TMC

La Grande TMC

Within these regions, the ITS Plan provides a list of projects to implement over the short-term (0-5 years), medium-term (5-10 years) and long-term (10-20 years). The estimated capital, operation and maintenance (O&M), and staffing costs are:

Capital, O&M and Staffing Costs (in thousands)

	Capital	O&M	Staffing
Short-term (Year 1-5)			
Portland Region	**$35,680**	**$6,825**	**$5,300**
Salem Region	**9,810**	**1,335**	**4,100**
Medford Region	**4,540**	**10**	**1,500**
Bend Region	**4,500**	**-**	**1,500**
La Grande Region	**4,700**	**50**	**1,500**
Statewide deployment	**43,100**	**8,920**	**-**
Mid-term (Year 6-10)			
Portland Region	**17,375**	**11,175**	**5,300**
Salem Region	**2,400**	**1,560**	**4,350**
Medford Region	**3,000**	**635**	**2,600**
Bend Region	**3,000**	**625**	**2,600**
La Grande Region	**2,500**	**625**	**2,600**
Statewide deployment	**36,775**	**16,120**	**-**
Long-term (Year 10-20)			
Portland Region	**9,345**	**27,030**	**10,600**
Salem Region	**700**	**3,470**	**8,700**
Medford Region	**-**	**1,270**	**5,200**
Bend Region	**-**	**1,250**	**5,200**
La Grande Region	**-**	**1,250**	**5,200**
Statewide deployment	**38,625**	**44,050**	**-**
TOTAL	**$216,050**	**$126,200**	**$66,250**

Potential ITS Benefits

Based upon experience in other parts of the country, the deployment of ITS is expected to generate benefits as categorized below:

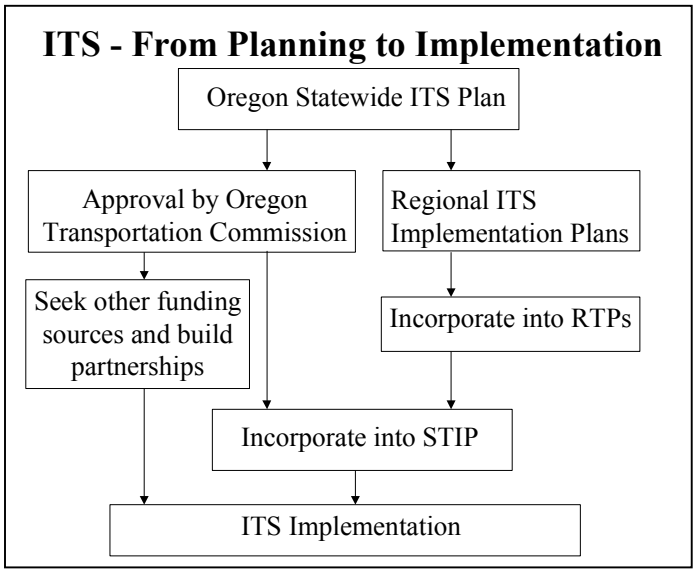
ITS Systems	Potential Benefits
Advanced Traffic Management System	
Travel Time	Decrease 8% to 48%
Travel Speed	Increase 16% to 62%
Vehicle Stops	Decrease 0% to 35%
Delay	Decrease 17% to 37%
Accident Reduction	Decrease 10% to 35%
Fuel Consumption	Decrease 6% to 12%
Emissions	Decrease 5% to 13% for CO emissions Decrease 4% to 10% for HC emissions
Incident Management System	
Incident Clearance Time	Decrease 8 minutes for stalls Decrease wrecker response time 5-7 mins.
Travel Time	Decrease 10% to 42%
Fatalities	Decrease 10% in urban areas
Advanced Traveler Information System	
Travel Time	Decrease 7% to 12%
Emissions	Decrease 33% of CO Decrease 1.5% of Nox
Advanced Public Transit System	
Travel Time	Decrease 15% to 18%
Service Reliability	Increase 12% to 23% in on-time performance
Security	Decrease incident response time to as little as one minute
Cost Effectiveness	45% annual return on investment

Steps Towards Implementation

Implementation of the ITS Strategic Plan needs to be a cooperative effort among all the public agencies and private entities concerned. Preparation of this ITS Strategic Plan does not mean this is the end of the ITS planning process for Oregon. On the contrary, this represents a beginning step towards ITS planning and implementation for Oregon. This ITS Plan was developed based on existing technology, institutional framework, and public policies prevailing in 1997. It needs to evolve over time to capture new technologies, new participants, and new opportunities arising in future.

This ITS Plan was developed with enough flexibility for the different regions and agencies to refine the ITS design and implementation that suits their individual geographical and regional needs. As a statewide plan, it provides a framework of ITS programs through which Oregon will stand to benefit. Each individual region, agency or coalition of agencies should follow the framework established here to develop a detailed ITS design and implementation program that will best benefit their respective needs. As a guiding framework, it is recommended that the following "Sub-regional ITS Implementation Plans" to be prepared:

- Portland Metropolitan Region Multi-modal ITS Plan
- ODOT Region 2 ITS Implementation Plan
- ODOT Region 3 ITS Implementation Plan
- ODOT Region 4&5 ITS Implementation Plan
- I-5 Corridor ITS Implementation Plan
- I-84 Corridor ITS Implementation Plan



To take the ITS Plan through to implementation requires the following steps. First, the Plan needs to be approved by the Oregon Transportation Commission before it can be incorporated into the STIP. Secondly, other Regional ITS Plans may be developed. These regional plans shall be incorporated into the respective MPOs Regional Transportation Plans (RTP), which would also be incorporated into the STIP. Meanwhile, ODOT and other agencies shall consider and seek other funding sources for ITS, such as the federal NEXTEA ITS grants and partnerships with the private sector, to facilitate implementation.

Partnerships

Although the projects in this plan involve mainly public sector leadership, many of them involve partnerships with the private sector and other public sector participants.

The following projects shall be candidates for public/private partnerships:

- Shared Resources with telecommunication companies is an integral part of this plan. It is assumed in this plan that the communication network is provided through the Shared Resources Project, which ODOT has already initiated. This is estimated to save $200 million over 20 years.
- Commercial vehicles using the state highway system can be used as probes to obtain real-time information. This is a candidate for partnership with the large fleet operators.
- Partnership with cellular telephone service providers will facilitate statewide use of a common cellular number to report incidents (e.g. *999)
- Partnership with volunteer agencies such will promote the establishment of Freeway Service Patrol.
- Partnership with commercial vehicle operators will facilitate development of an integrated hazardous material response system.
- Partnership with traveler information providers (e.g. TV and radio) will facilitate two way sharing of traffic information.
- Partnership with Cable TV companies will facilitate establishment of cable TV channels for traffic information.
- Partnership with telephone companies will facilitate establishment of telephone traveler information.
- Partnership with local industries and Chambers of Commerce will facilitate deployment of kiosks that provide traveler information as well as travel services such as “yellow page”, hotel reservations, etc.

The following projects are candidates for public/public partnerships:

- Implementation of CCTV, CMS and other infrastructure at near the state borders should be carried out in consultation with the neighboring states.
- Transit vehicles can be used as probes to obtain real-time information. With AVL systems installed on transit vehicles, the location and speed information can be used to determine road traffic conditions. Besides, an integrated traffic management system will also facilitate priority for transit vehicles that are behind schedule to improve transit performance.
- Partnership with emergency service providers (police, fire, etc) will assist the implementation of priorities for emergency vehicles.
- Partnership with local cities and counties is necessary for development of suitable detour routes during major incident on freeways.
- Partnership with all the emergency response agencies in the state is a necessary step towards deployment of an integrated statewide emergency response system.

Policy and Financial Elements

Implementation of the ITS Strategy must also take into consideration the following principles and guidance in order to maximize the success of individual projects and the ITS program as a whole.

- The user service priorities identified in the strategy need to be validated to assure that travelers and freight shippers will accept and use the services. Individual projects and services should develop market research prior to implementation and should provide an evaluation process after implementation.

- Permanent sources of funding for operations, maintenance and staffing must be secured prior to committing funds for capital.

- Financing for individual projects and program elements should include participation by identified private sector beneficiaries. Such participation can include both direct funding and provision of in-kind services.

- Public sector transportation providers will have primary responsibility for financing development of the ITS infrastructure through existing and new taxes and user charges. Private sector ITS service providers will be responsible for participating in financing of ITS infrastructure elements that serve as inputs for their marketable services. Private sector users of ITS services will be responsible for providing equipment and services that add value to the outputs from the ITS infrastructure.

- Certain legal and institutional issues will have a strong influence on the ability of ITS to achieve its full potential. Because most of these issues have a statewide impact, ODOT should lead appropriate efforts to analyze and make recommendations how they should be resolved by legislative, administrative and other means.

    - Individual and commercial privacy
    - Tort liability
    - Procurement
    - Regulatory structure
    - Jurisdictional authority to delegate certain functions
    - Agency coordination
    - Public / Private cooperation

ITS Implementation Plan

The projects identified for implementation within each region is provided below:

Portland Region – Short Term					
Project	**Agency**	**Quan-tity**	**Capital Cost (in 1,000)**	**Annual O&M Costs**	**Annual Staffing Cost**
Install CCTV Surveillance Cameras & integrate weather data at CCTV sites					
Portland area freeway systems	ODOT	25	$875	$44	
City street system	City of Beaverton	10	$350	$18	
Install detectors (ILD, video, radar technologies, etc.)					
Portland area freeway system	ODOT	100	$2,500	$125	
Portland city street system	City of Portland	210	$3,150	$158	
Countywide street system	County of Multnomah	17	$425	$22	
Beaverton city street system	City of Beaverton	10	$250	$13	
Install Photo Violation Detection					
School zones in Portland	City of Portland	3	$60	$3	
Neighborhood Control	City of West Linn	5	$100	$5	
Neighborhood Control	City of Gresham	1	$20	$1	
East County area	County of Multnomah	3	$60	$3	
School zones	City of Hood River	1	$20	$1	
Probe Surveillance using Transit, HOV, & Fleet Operators					
TRI-MET Transit Service in Portland	TRI-MET	-	$1,000	$50	
Regional Traffic Management Center					
Portland	ODOT & local	1	$10,000	$500	$660
Ramp Metering System					
Portland metropolitan area	ODOT		$3,000	$150	
Automatic Incident Detection System					
Portland Traffic Management Center	ODOT & local	-	$1,000	*	*
Incident Dispatch & Response					
Dedicated Staff for incident management	ODOT, OSP and local	-	$2,500		$200
Pre-planned Detour Routes					
Portland metropolitan area	ODOT & local	TBD	$1,000		
Local Traveler Information Database					
Portland metro area & I-84 corridor	ODOT & local		$2,000		$100
Highway Advisory Radio (HAR)					
Portland metropolitan area	ODOT & local	4	$200	$10	
Multnomah County	County of Multnomah	1	$50	$3	

Portland Region – Short Term (cont.)

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Internet Traveler Information Website					
Portland area	Local	1	$50	$3	
TRI-MET	TRI-MET	1	$50	$3	
Other cities & counties	Various	2	$100	$6	
Install Kiosks to provide static or interactive traveler information					
Portland area	TRI-MET	117	$1,170	$59	
Variable Message Signs					
Portland metropolitan area	Cities	50	$1,500	$75	
Variable Speed Advisory Signs					
Portland metropolitan local street	City of Portland	2	$50	$3	
Icy Bridge Warning Signs					
Hawthorne & Broadway Bridges	Multnomah County	2	$200	$10	
Transit Location/Information System					
Portland metropolitan area	TRI-MET	-	$2,000		$100
Flexible Route Smart Shuttles					
Tri-county area: Multnomah, Washington, Clackamas	Volunteer Transportation Dial-a-Ride	-	$2,000	$100	
		TOTAL	**$35,680**	**$1,365**	**$1,060**

* ***O&M and staffing costs are included in Regional TMC operating cost.***
** ***O&M and staffing costs are negligible based on the assumption of private service providers.***

Portland Region – Mid Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install CCTV Surveillance Cameras & integrate weather data at all CCTV sites					
Portland Area Fwys	ODOT	25	$875	$44	
Portland city street systems	City of Portland	50	$1,750	$88	
Transit stations	TRI-MET	50	$1,750	$88	
Ramp Metering System					
Portland Metropolitan Area	ODOT		$4,000	$200	
Transit Priority System					
Portland metropolitan area	Cities, TRI-MET	TBD	$6,000	$300	
Variable Message Signs					
Portland Area Freeways	ODOT	10	$3,000	$150	
		TOTAL	**$17,375**	**$870**	

Portland Region – Long Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install CCTV Surveillance Cameras & integrate weather data at all CCTV sites					
Portland Area Freeways	ODOT	20	$700	$35	
Near I-84, and county street system	Multnomah County	17	$595	$30	
Internet Traveler Information Website					
Hood River	City of Hood River	1	$50	$3	
Variable Message Signs					
Portland freeway system	ODOT	10	$3,000	$150	
Ramp Metering System					
Portland Freeway System	ODOT		$5,000	$250	
		TOTAL	**$9,345**	**$468**	

Salem Region – Short Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install Photo Violation Detection					
Each end of the City	City of Wheeler	2	$40	$2	
Near Interstate 101	City of Gearhart	1	$20	$1	
Regional Traffic Management Center					
Salem	ODOT & local	1	$5,000	$250	$520
Incident Dispatch & Response					
Dedicated Staff for incident management	ODOT, OSP & local	-	$2,500		$200
Local Traveler Information Database					
North I-5 corridor	ODOT & local	-	$2,000		$100
Internet Traveler Information Website					
Astoria	City of Astoria	1	$50	$3	
Seaside	City of Seaside	1	$50	$3	
Wheeler	City of Wheeler	1	$50	$3	
Icy Bridge Warning Signs					
Highway 26	City of Seaside	1	$100	$5	
		TOTAL	**$9,810**	**$267**	**$820**

Salem Region - Mid Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install CCTV Surveillance Cameras City street system	City of Eugene	20	$700	$35	
Install Photo Violation Detection Key locations countywide	Marion County	10	$200	$10	
Automatic Incident Detection System Salem Traffic Management Center	ODOT & local	-	$500	*	*
Local Traveler Information Database Coastal	Local	-	$1,000		$50
		TOTAL	**$2,400**	**$45**	**$50**

* ***O&M and staffing costs are included in Regional TMC operating cost.***

Salem Region - Long Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install CCTV Surveillance Cameras Countywide street systems	Marion County	20	$700	$35	
		TOTAL	**$700**	**$35**	

Medford Region – Short Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install Photo Violation Detection High accident locations	City of Medford	2	$40	$2	
Incident Dispatch & Response Dedicated Staff for incident management	ODOT, OSP & local	-	$2,500		$200
Local Traveler Information Database Medford area	ODOT & local	-	$2,000		$100
		TOTAL	**$4,540**	**$2**	**$300**

Medford Region – Mid Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Regional Traffic Management Center Medford	ODOT & local	1	$2,500	$125	$220
Automatic Incident Detection System Medford Traffic Management Center	ODOT & local	1	$500	*	*
		TOTAL	**$3,000**	**$125**	**$220**

* ***O&M and staffing costs are included in Regional TMC operating cost.***

Bend Region - Short Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Incident Dispatch & Response Dedicated Staff for incident management	ODOT, OSP & local	-	$2,500		$200
Local Traveler Information Database Bend	ODOT & local	-	$2,000		$100
		TOTAL	**$4,500**	**$0**	**$300**

Bend Region - Mid Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Regional Traffic Management Center Bend	ODOT & local	1	$2,500	$125	$220
Automatic Incident Detection System Bend Traffic Management Center	ODOT & local	-	$500	*	*
		TOTAL	**$3,000**	**$125**	**$220**

* ***O&M and staffing costs are included in Regional TMC operating cost.***

La Grande Region - Short Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Incident Dispatch & Response Dedicated Staff for incident management	ODOT, OSP & local	-	$2,500		$200
Local Traveler Information Database	ODOT & local	-	$2,000		$100
Icy Bridge Warning Signs Snake River Bridge Wallowa River Bridge	City of Nyssa City of Enterprise	2	$200	$10	
		TOTAL	**$4,700**	**$10**	**$300**

La Grande Region - Mid Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Regional Traffic Management Center La Grande	ODOT & local	1	$2,500	$125	$220
		TOTAL	**$2,500**	**$125**	**$220**

Statewide Implementation - Short Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install detectors (ILD, video, radar technologies, etc.) Major highway/arterial systems	ODOT & local cities	250	$3,750	$188	
Install Preemption for Emergency Vehicles Statewide highway/arterial system	ODOT	TBD	$3,000	$150	
Cellular Call-in Dedicated cellular call-in number	ODOT	TBD	$1,000	$50	
Highway Service Patrol State highway system	ODOT		$7,000	*	*
Pre-planned Detour Routes Statewide/Regional detour plans	ODOT & local cities	TBD	$500		
Weather Information System Statewide	ODOT	35	$1,750	$88	
Hazardous Material Response Statewide hazardous material information	ODOT	-	$1,000	$50	
Highway Advisory Radio (HAR) Statewide locations	ODOT	6	$300	$15	
Internet Traveler Information Website Statewide	ODOT	5	$250	$15	
Install Kiosks to provide static or interactive traveler information Statewide	ODOT & local	120	$1,200	$60	
Variable Message Signs Statewide	Cities	400	$12,000	$600	
Variable Speed Advisory Signs Statewide	ODOT & local	14	$350	$18	
Flexible Route Smart Shuttles Statewide	Local	-	$1,000	$50	
Integrated Statewide Emergency Response Wide Area Network coordination	ODOT and cities	-	$1,000	$50	
AVL/In-Vehicle Navigation System for Emergency Vehicles Statewide	ODOT, OSP & local	-	$9,000	$450	
		TOTAL	**$43,100**	**$1,784**	

* ***O&M and staffing costs are negligible based on the assumption of private service providers.***

Statewide Implementation – Mid Term

Project	Agency	Quantity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install CCTV Surveillance Cameras Statewide freeway/highway system	ODOT	75	$2,625	$131	
Probe Surveillance using Transit, HOV, & Fleet Operators Equip commercial vehicles as probes	ODOT	-	$5,000	$250	
Traffic Responsive Signal System Statewide installation	ODOT & local	1000 I/S	$5,000	$250	
Ramp Metering System I-5 Corridor (Eugene, Salem, Medford)	ODOT	100	$2,500	$125	
Weather Information System Statewide	ODOT	35	$1,750	$88	
Highway Service Patrol State highway system	ODOT	-	$7,000	*	*
Telephone Traveler Information Statewide toll-free telephone no. for traveler information	ODOT	5	$1,000		
Variable Message Signs Mountain passes & snow area	ODOT	40	$1,200	$60	
Variable Speed Advisory Signs Statewide	ODOT & local	18	$450	$23	
Commercial Vehicle Speed Warning System Statewide	ODOT	25	$1,250	$63	
AVL/In-Vehicle Navigation System for Emergency Vehicles Statewide	ODOT, OSP & local	-	$9,000	$450	
		TOTAL	**$36,775**	**$1,440**	

Statewide Implementation – Long Term

Project	Agency	Quan-tity	Capital Cost (in $1,000)	Annual O&M Costs	Annual Staffing Cost
Install CCTV Surveillance Cameras Statewide freeway/highway system	ODOT	75	$2,625	$131	
Adaptive Traffic Signal Control System Statewide highway/arterial system	ODOT & local	250 I/S	$5,000	$250	
Transit Priority System Statewide highway/arterial system	ODOT	100 I/S	$1,000	$50	
Highway Service Patrol Portland freeway system	ODOT		$15,000	*	*
Weather Information System Statewide	ODOT	20	$1,000	$50	
Icy Bridge Warning Signs Statewide	ODOT	20	$2,000	$100	
Transit Location/Information System Statewide	ODOT	TBD	$3,000	$150	
AVL/In-Vehicle Navigation System for Emergency Vehicles Statewide	ODOT, OSP & local	-	$9,000	$450	
		TOTAL	**$38,625**	**$1,181**	

* ***O&M and staffing costs are included in Regional TMC operating cost.***

Acknowledgements

The Oregon Statewide ITS Strategic Plan was prepared with the assistance of many people. The Oregon Department of Transportation wishes to acknowledge the following people for participating and providing valuable input towards the preparation of this plan:

Project Manager

Dave Lutz	Oregon Department of Transportation

Steering Committee

Ralph Blanchard	Polk County Commission
Andy Cotugno	METRO
Sgt. Curt Curtis	Oregon State Police
Chris Davies	City of Seaside
John Grassman	Oregon Department of Transportation
Steve Grasty	Former Commissioner, Harney County
Robert Kortt	City of Medford
Susie Lahsene	Port of Portland
Don Morris	United Parcel Service
Lana Nelson	TRI-MET
Dain Nestle	May Trucking Company
Dave Reilly	Federal Highways Administration
Gerry Smith	Washington Department of Transportation
Goran Sparrman	City of Portland
Ron Winterrowd	Oregon Department of Transportation

Technical Committee

Ken Evert	ODOT – Motor Carrier Branch
Edward Fischer	Federal Highways Administration
Ted Paselk	Washington Department of Transportation
Kenneth Turner	TRI-MET
Ed Immel	ODOT – Rail Section
Kate Hunter-Zaworski	Oregon State University
Dennis Mitchell	ODOT – Region 1
David Neys	ODOT – District 10
Robert Fynn	ODOT – Technical Services Branch
Jay Riley	Caltrans – Advanced Technology Branch
Pete La Belle	Department of Administrative Services
Russell Hari	ODOT – Information Services Branch

Consultant Team

Leo Lee	DKS Associates
Randy McCourt	DKS Associates
Trissa de Jesus	DKS Associates
Eric Shen	DKS Associates
Keith Rand	DKS Associates
Doug Zenn	Pacific Rim Resources