Regional ITS Operations & Implementation Plan for The Eugene-Springfield Metropolitan Area

Executive Summary

November 2003

Prepared by

& IBI GROUP

In association with

ODOT
Lane County
City of Eugene
City of Springfield
Lane Council of Governments
Lane Transit District
Federal Highway Administration

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Project Background

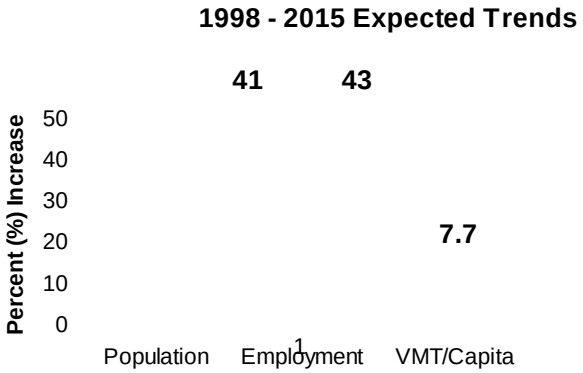
A collective effort by the Oregon Department of Transportation (ODOT), Lane County, the City of Eugene, the City of Springfield, the Lane Council of Governments (LCOG), and the Lane Transit District (LTD) has led to the *Regional Intelligent Transportation System (ITS) Operations & Implementation Plan for the Eugene-Springfield Metropolitan Area*. This plan strives to deploy ITS projects, which include advanced technologies and management techniques, to improve the safety and efficiency of the transportation system over the long term. It is also consistent with similar efforts in other regions and statewide to ensure the ITS strategies utilized are integrated and complementary. This document provides the Executive Summary of the Final Report.

The Problem

From 1996 to 2001, the amount of annual delay increased from 595 to 1,236 person-hours in the Eugene-Springfield metropolitan area, according to an annual urban mobility report[1]. The report also estimates that the annual cost of congestion increased from $10 to $25 million during that same time period. Congestion results in travel delay, reduced productivity, and a frustrated driving public.

The population in Lane County grew 14 percent from 1990 to 2000 according to the *2000 Census*, and LCOG's forecasts in the *TransPlan* indicate that from 1998 to 2015 the population in the Eugene-Springfield metropolitan area will grow 41 percent and employment will grow 43 percent. Other trends predicted by LCOG include a 7.7 percent increase in vehicle miles traveled per capita and a 293 percent increase in congested miles traveled as a percent of total miles traveled (a jump from 2.7 percent of total miles traveled to 10.6 percent). The expected growth in population, employment, and vehicle miles of travel will place an enormous burden on the existing transportation infrastructure.

At the same time, public agencies have come to realize that building new transportation infrastructure as the single means of relieving congestion is not feasible, particularly due to high land and construction costs and environmental constraints. Therefore, a systematic approach is necessary to effectively manage the region's transportation system and capitalize on the existing infrastructure as the region grows. This includes applying Intelligent Transportation Systems (ITS) in conjunction with new roadway construction.



The Opportunity

ITS applications provide a viable opportunity for improving the safety and efficiency of the surface transportation system in the Eugene-Springfield metropolitan area. These applications help improve transportation system operations by performing a function more quickly or reliably or by providing a service that was not previously available. In effect, ITS improves the mobility of people and goods on the existing roadways and also provides the potential for substantial savings on future construction, particularly of highways. It is often easy to overlook the importance of investing in operations, but it is necessary to ensure that the traveling public makes safe and efficient use of existing roadways.

[1] Schrank, David and Tim Lomax. The 2003 Annual Urban Mobility Report, Texas Transportation Institute, Texas A&M University System, Sept. 2003.

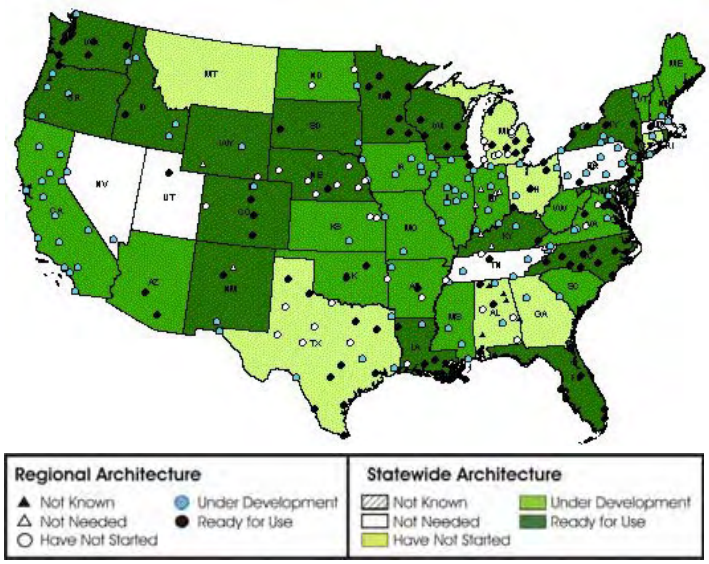
Project Background

What is ITS?

Intelligent Transportation Systems (ITS) involve the application of advanced technologies and proven management techniques to solve transportation problems, enhance safety, provide services to travelers, and assist transportation system operators in implementing suitable traffic management strategies. ITS focuses on increasing the efficiency of existing transportation infrastructure, which enhances the overall system performance and reduces the need to add capacity (e.g., travel lanes). Efficiency is achieved by providing services and information to travelers so they can (and will) make better travel decisions and to transportation system operators so they can better manage the system.

Why Develop an ITS Plan?

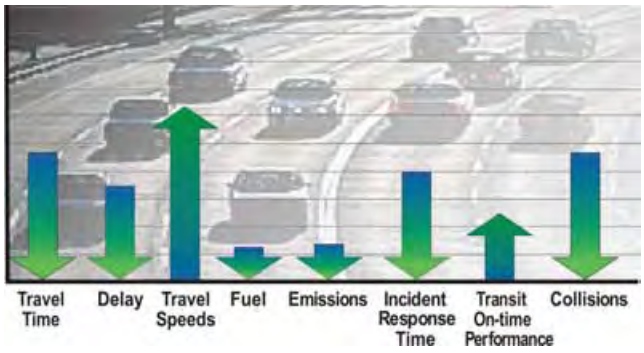
An ITS plan provides a framework of policies, procedures, and strategies for integration of a region's existing resources to effectively meet future regional transportation needs and expectations. The following reasons provide the basis for developing an ITS plan for the Eugene-Springfield metropolitan area:



- The region cannot build itself out of congestion.
- The region endeavors to maximize the efficiencies and improve the safety of the existing infrastructure.
- The public demands better information about traffic congestion.
- The plan fosters mulit-agency coordination for system operations.
- The Federal Highway Administration requires that all ITS projects funded through the Highway Trust Fund shall be in conformance with the National ITS Architecture and applicable standards.

What are the Expected Benefits?

Intelligent Transportation System projects are aimed at improving the safety and operational efficiency of our existing transportation infrastructure by reducing vehicle delays related to recurrent and non-recurrent congestion, reducing accidents and incident response times, and providing travelers with real-time information to make informed route and mode choice decisions. Quantifiable benefits resulting from Intelligent Transportation Systems include:



- Reduced vehicle delays
- Reduced accidents
- Improved air quality
- Reduced fuel consumption
- Improved travel times

Other accrued benefits, which are more difficult to quantify, include reduced driver frustration and reduced driver anxiety from having real-time travel information. Additionally, improved efficiency due to coordinated and cooperative agency actions can produce long term savings, particularly in relation to coordinating regional projects and a coordinated regional response to incidents.

Project Background

To estimate the potential benefits resulting from the proposed projects within this plan, the ITS Deployment Analysis System (IDAS), developed by the Federal Highway Administration, was used. This software uses the regional travel demand model for the base conditions and proposed ITS projects can be deployed onto the existing Eugene-Springfield network. The software identifies the resulting potential reduction in delays, fuel consumption, emissions and accidents deployed within the network. Based on this benefits analysis, the potential benefits associated with the proposed 10-year deployment plan are significant. Overall, the expected benefit-to-cost ratio for the implementation of the full 10-year plan is approximately 10 to 1. The table at right summarizes the expected benefits for the forecast year 2015 as they relate to our project goals. This section also includes example benefits from other projects around the State and the County.

Benefits from 10-Year ITS Deployment Plan

Project Goal	Projected Benefit/Day
Improve and Maintain a Safe Transportation System	✓ 9 Percent Reduction in Crashes
Improve the Efficiency of the Transportation System	✓ 100 Hours Saved Daily by Travelers ✓ 24,000 Gallons Fuel Saved ✓ 10 Percent Reduction in Emissions ✓ Travel Time Reliability Improved 67 Percent
Deploy Functional and Cost Effective ITS Infrastructure	✓ 10-to-1 Benefit-to-Cost Ratio

Coordinated Signal Timings

State-of-the-art traffic signal systems, with communication to a central computer and coordinated signal timing plans have proven to produce substantial benefits to the public. Examples from local coordinated signal timing projects in Oregon have produced the following benefits:

- 10- to 40-percent reduction in stops
- 5- to 25-percent reduction in travel time
- 15- to 45-percent reduction in delay
- Up to 15-percent reduction in fuel consumption

Ramp Meters

Ramp meters are used to regulate the flow of traffic onto a freeway. The purpose of a ramp meter is to smooth the flow of traffic on the freeway and to reduce accidents resulting from merging conflicts. In 2000, Minneapolis, Minnesota shut down all of its ramp meters and performed a benefits assessment. The results of this assessment showed ramp meters were responsible for:

- 21-percent reduction in crashes
- 22-percent decrease in travel times
- 10-percent increase in the volume of traffic accommodated by area freeways

Incident Management

The Oregon Department of Transportation in association with the Oregon State Police currently operates an incident management program in Region 2 to assist disabled vehicles. The incident management program includes incident response vehicles that patrol the Region 2 roadways to assist motorists and reduce the duration of incidents and reduce the resulting traffic congestion. Based on a recent evaluation of the program[2], the following benefits have been produced:

- 15-percent reduction in average incident duration
- 35-percent reduction in vehicle-hours incident delay

[2] *Evaluation of Region 2 Incident Response Program Using Archived Data*, Portland State University, June 30, 2001.

Project Background

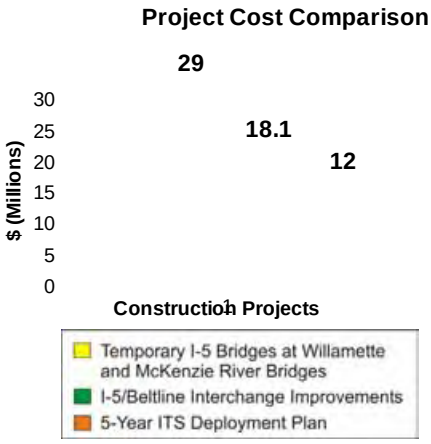
Traveler Information

The dissemination of real-time traveler information provides travelers the ability to make informed travel choices, which could include changing a route, or selecting an alternate mode of travel. The resulting benefits include:

- 7- to 12- percent reduction in travel time
- Up to 33- percent reduction in emissions

Cost Comparison

ITS components can be deployed throughout the Eugene-Springfield Metropolitan area for a fraction of the cost of large construction projects.



Project Approach

The figure below illustrates the project approach for the development of an ITS plan for the Eugene-Springfield metropolitan area. The stakeholder outreach program has been an integral part of developing a cooperative plan that meets regional needs regardless of jurisdiction.

A Steering Committee composed of key stakeholders from regional transportation agencies guided the project with additional input from expanded stakeholders that represented local emergency management agencies, the City of Coburg, and the University of Oregon. Key stakeholder outreach activities included the following:

- Monthly Steering Committee meetings
- Interviews with key stakeholders to collect transportation user needs information
- Two expanded stakeholder meetings (User Needs and Deployment Plan)

The following sections describe the results of the plan process for the 20-year Eugene-Springfield ITS Plan,with particular focus on these six interest areas:

- Travel &Traffic Management
- Communications
- Public Transportation Management
- Emergency Management
- Information Management
- Maintenance & Construction Management

Key Stakeholders	Expanded Stakeholders
Oregon Department of Transportation	City of Coburg
Lane County	University of Oregon
City of Eugene	Public Agency Network
City of Springfield	Central Lane Communications
Lane Council of Governments	Oregon State Police
Lane Transit District	City of Eugene Police Department
Federal Highway Administration	City of Eugene Fire & EMS Department
	City of Springfield Police Department
	City of Springfield Fire & Life Safety

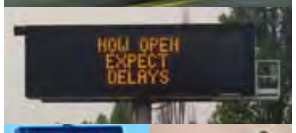
Mission, Goals & Objectives

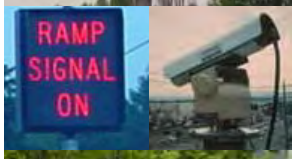
Our Mission Statement is:

The Eugene-Springfield area strives to enhance the safety and efficiency of multi-modal travel through the use of advanced technologies, transportation management techniques, agency coordination, and partnerships.

The following project goals and objectives were developed to obtain our mission:








Goal #1: Build consensus and improve coordination among project stakeholders.

- Build consensus among the Steering Committee members.
- Build a coalition among all ITS stakeholders in the Eugene-Springfield metropolitan area.
- Share resources between local and regional agencies.
- Coordinate and integrate projects with other agencies.
- Promote public and private partnerships for ITS deployment, operations, and maintenance.
- Develop a concept of operations with a seamless interface between agencies.

Goal #2: Improve and maintain a safe transportation system.

- Reduce frequency, duration, and effects of incidents.
- Reduce emergency response times.
- Reduce recurrent congestion.
- Coordinate incident response with other local and regional agencies.

Goal #3: Improve the efficiency of the transportation system.

- Improve travel time for vehicles, including transit vehicles.
- Reduce travel time variability.
- Reduce fuel consumption and environmental impacts.
- Improve transit service reliability.
- Improve maintenance and operations efficiencies.

Goal #4: Deploy functional and cost efficient ITS infrastructure.

- Deploy systems that fit in with future improvements.
- Deploy systems with a high benefit-to-cost ratio.
- Deploy systems that maximize the use of existing infrastructure.
- Deploy systems with minimal use of maintenance and operational support.
- Integrate deployments with other local and regional projects.

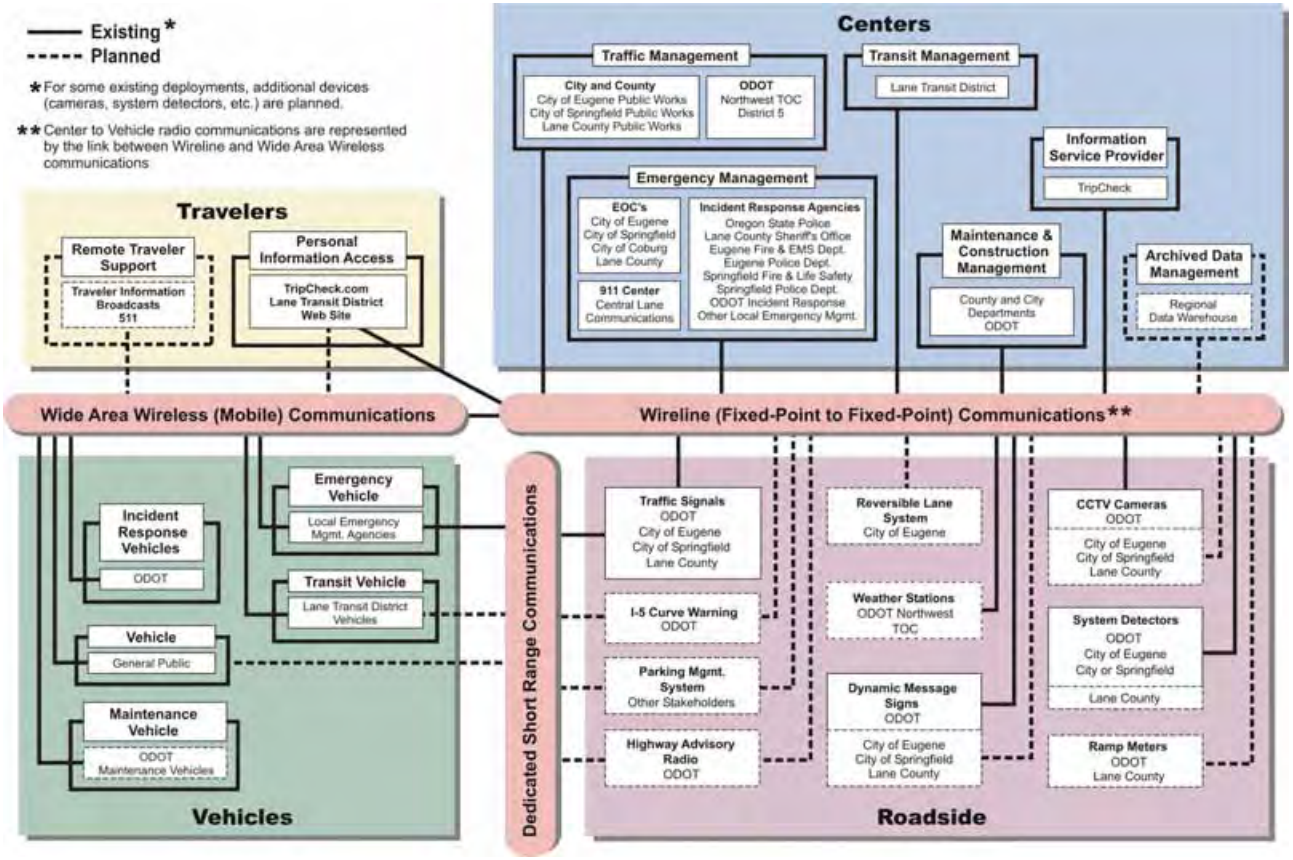
Goal #5: Develop a commitment to ITS deployment in the Eugene-Springfield area.

- Create a regional architecture that complements the statewide architecture.
- Develop a phased implementation process based on a prioritized project list.
- Identify unique funding in addition to utilizing traditional funding sources.
- Develop a process that ensures program continuation.
- Integrate the ITS Plan with the Central Lane TMA regional transportation plan and other transportation plans in the region.

Eugene-Springfield ITS Architecture

The National ITS Architecture and the Oregon Statewide ITS Architecture provide the basis for the Eugene-Springfield ITS Architecture. The figure below depicts the physical architecture for the Eugene-Springfield metropolitan area and includes key stakeholders, existing and desired services (or ITS elements), and the necessary interconnections and information flows required to ensure system compatibility and interoperability.

Providing compatibility amongst jurisdictions will enable the region to fully maximize the use of ITS technologies. For example, an LTD bus traveling along ORE 126 must be able to communicate with the traffic signals in both the cities of Eugene and Springfield to allow for transit signal priority. The physical architecture ensures this happens by identifying the connection to the appropriate agencies (ie. LTD, City of Eugene, and City of Springfield) and their equipment (ie. traffic signals and transit vehicles) and the information required to provide the desired service (ie. transit signal priority).



Eugene-Springfield Physical ITS Architecture

Concept of Operations

The concept of operations, which supplements the ITS physical architecture, defines the roles and responsibilities of the participating transportation and public safety agencies and identifies information flows between the agencies in the Eugene-Springfield metropolitan area. The concept of operations defines the responsibilities of the various agencies providing ITS services in the region for activities such as design, construction, integration, planning, operations and maintenance. In addition, the concept of operations defines the level and types of information shared between agencies such as data, video, status, request and control.

ITS Deployment Plan

The Eugene-Springfield Deployment Plan is organized into three time frames: 0-5 years, 6-10 years, and 11-20 years. Based on stakeholder input and key findings from system evaluations, the projects recommended for implementation in the Eugene-Springfield metropolitan area have been organized and described by the following program areas:

- Travel & Traffic Management (TM)
- Communications (CO)
- Public Transportation Management (PTM)
- Emergency Management (EM)
- Information Management (IM)
- Maintenance & Construction Management (MC)

Each program area is described on the following pages, with additional details in Tables 1 - 4 about projects included in the 5-Year Plan. A key component of the 5-Year Plan is the implementation of traveler information collection devices on the primary corridors.

Table 5 summarizes the complete list of projects along with pertinent details. The project numbers used in this table are for reference purposes only and do not indicate any type of priority. A priority of high (H), medium (M), or low (L) is assigned to each project in the table and correlates to the 5-Year Plan, 10-Year Plan, and 20-Year Plan, respectively. Priorities are based on existing and future corridor operation, focusing on recurrent congestion, traffic data, bottlenecks and accident data. Figure 1 provides a graphic summary of the full 20-Year ITS Plan.

Travel & Traffic Management

Projects within this Program Area are focused on improving the efficiency and safety of our existing roadway system by providing tools to better manage the existing infrastructure, to coordinate with regional partners and to provide traveler information to the public. The following projects are part of the 5-Year Plan.

Regional Freeway Congestion Management

The purpose for these projects is to improve travel time, to reduce incident response time, and to reduce crashes and the effects of crashes. To accomplish this purpose the following items will be deployed in the 5-Year Plan.

Table 1. Capital Costs for 5-Year Regional Freeway Congestion Management Plan

Surveillance, Traffic Control & Management	Capital Cost
Beltline Highway (Install CCTV, dynamic message signs, ramp meters, system detectors, and communications from River Rd to I-5)	$3,250,000
I-5 (Install CCTV, dynamic message signs, and communications)	$1,400,000
I-105 (Install CCTV and communications)	$320,000
ORE 126 (Install CCTV, system detectors, and communications)	$820,000
Traveler Information	**Capital Cost**
Display CCTV images and congestion/incident information on TripCheck	$150,000
Install Highway Advisory Radio (HAR) for the metropolitan area	$350,000
Communications	**Capital Cost**
Install fiber optic communications to interconnect agencies as the base for the Virtual TOC	$2,000,000
Planning	**Capital Cost**
Develop Incident Management Operational Plans	$200,000
Develop an Evacuation Route Plan	$120,000
TOTAL:	**$8,610,000**

Northwest Transportation Operations Center (NWTOC)

Permanent Dynamic Message Sign

CCTV Camera

Regional Arterial Congestion Management

These projects are intended to improve travel time and reduce crashes and the effects of crashes. To accomplish this purpose the following 5-Year Plan items will be deployed.

Table 2. Capital Costs for 5-Year Regional Arterial Congestion Management Plan

Surveillance, Traffic Control & Management	Capital Cost
Coburg Road (Install CCTV at key intersections, count stations for collection of congestion information, and fiber optic communications to traffic signals on Coburg Road and between Coburg Road and the City of Eugene; Update coordinated signal timings)	$500,000
Gateway Street (Install traffic responsive signal timings, count stations and fiber optic communications; Transmit existing video detection images to the City of Springfield)	$125,000
30th Avenue (Install coordinated signal timings near I-5)	$10,000
Traveler Information	**Capital Cost**
Display CCTV images and congestion/incident information on TripCheck	$100,000
TOTAL:	**$735,000**

Beltline Rd at Gateway St

Coburg Rd at Beltline Hwy

Fiber Optic Cable Terminations

Communications

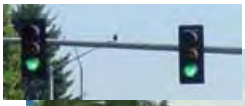
The Communications system plays an integral part in the deployment of the projects in the other five program areas by providing a network for information flows to and from field devices and stakeholder agencies. There are two projects slated for deployment during the 5-Year Plan: (1) the documentation of communications standards to ensure standardization and compatibility throughout the region and (2) the integration of radio infrastructure amongst regional agencies. For the most part, the communications network needed to support the ITS Plan will be deployed on a project-by-project basis throughout the next 20 years.

Public Transportation Management

Public Transportation Management technologies address two major aspects of transit operations: (1) transit traveler information systems and (2) transit agency operations and management. The projects in this category build off of the current LTD effort to deploy vehicle location technologies and a new computer aided dispatch system. Some of the benefits of these projects include more reliable bus travel times and improved transit traveler information. These 5-Year Plan projects include:

Table 3. Capital Costs for 5-Year Public Transportation Management Plan

Management	Capital Cost
Deploy automated vechicle locators (AVL), automatic passenger counters (APC), and a computer-aided dispatch (CAD) system on all main fleet coaches	$1,800,000
Traveler Information	**Capital Cost**
Provide real-time transit arrival information at key bus stops/transit centers and at special events	$500,000
Provide real-time transit information on the Internet	$350,000
Provide automated passenger information systems	$500,000
Traffic Control	**Capital Cost**
Deploy transit priority on Franklin Boulevard, Coburg Road and Pioneer/MLK Parkway	$600,000
TOTAL:	**$3,750,000**



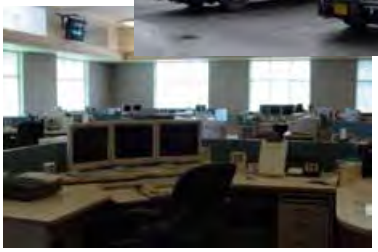
Transit Priority

Real-Time Customer Information Displays

ITS Deployment Plan

Emergency Management

Central Lane 911



ODOT Region 2 Incident Response

The purpose of the Emergency Management projects is to reduce emergency response times and to integrate emergency management with transportation and transit management. The emergency response projects included in the ITS Plan are highly dependent on the deployment of key travel and traffic management and communications projects, therefore none of these projects are included in the 5-Year Plan.

Information Management

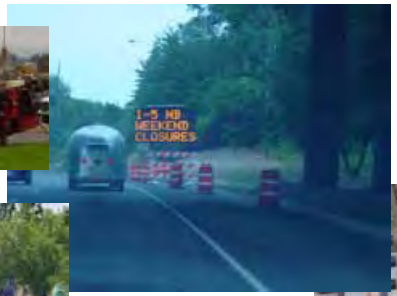
A critical part of this ITS Plan includes collecting, archiving, and managing all sorts of transportation-related data. Since much of the data collection is closely tied to projects that deploy field devices and systems to collect data, the main information management project has been included in the 10-Year Plan.

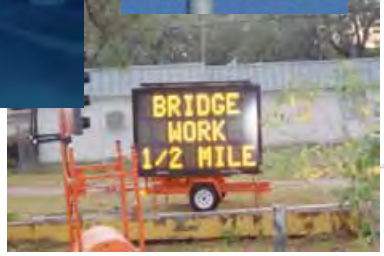
Maintenance & Construction Management

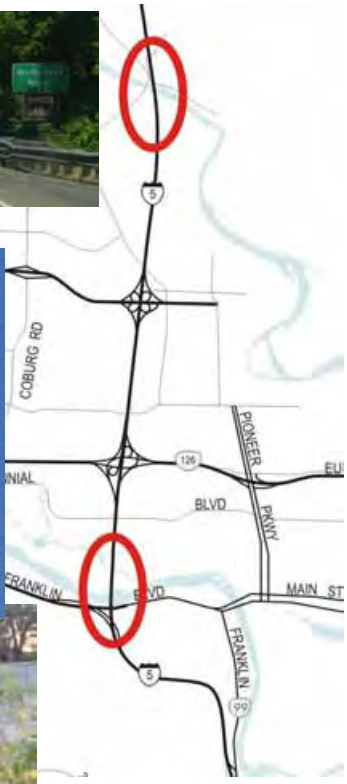
These projects are aimed at improving the safety of motorists and workers in construction zones. In addition, these projects are aimed at improving the efficiency of work zone management and control.

Table 4. Capital Costs for 5-Year Maintenance & Construction Management Plan

Surveillance	**Capital Cost**
Install CCTV on I-5 to monitor bridge reconstruction work zones and to provide traveler information	$75,000
Traveler Information	**Capital Cost**
Include driver feedback signs to display speed information and alert drivers traveling at a high rate of speed; Install portable dynamic message signs and install variable speed limit signs to dynamically adjust the speed limit through the work zones on I-5	$200,000
Communications	**Capital Cost**
Install fiber optic communications across the new bridges to connect to field devices on I-5	$125,000
Planning	**Capital Cost**
Develop work zone management standards	$50,000
TOTAL:	**$450,000**







LEGEND

CCTV Cameras
- Existing
- Proposed 0-5 Years
- Proposed 6-10 Years
- Proposed 11-20 Years

Dynamic Message Signs
- Existing
- Proposed 0-5 Years
- Proposed 6-10 Years
- Proposed 11-20 Years

Direction of Travel
- Northbound
- Southbound
- Eastbound
- Westbound

Dynamic Speed Sign Flashers
- Existing City of Eugene

System Detectors
- Existing
- Proposed 0-5 Years
- Proposed 6-10 Years
- Proposed 11-20 Years

Ramp Meters
- Proposed 0-5 Years
- Proposed 6-10 Years
- Proposed 11-20 Years

Weather Stations
- Existing

Parking Management
- Proposed 11-20 Years

Reversible Lane Management
- Proposed 6-10 Years

Curve Warning System
- Proposed 0-5 Years

Highway Advisory Radio Transmitters
- Proposed 0-5 Years

Not to Scale

Eugene - Springfield ITS Plan

Figure 1
ITS DEPLOYMENT PLAN

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
Travel & Traffic Management (TM)								
ES-TM-01	Regional Virtual Transportation Operations Center (TOC)	Project will determine the functional requirements for systems interfaces to traffic and transit management agencies, emergency management agencies, the NWTOC in Salem, and regional field devices.	M	ODOT Statewide TOC Software Project; This project relates to most of the Travel & Traffic Management projects included in this plan.	Depends on the planned communications installed between the NWTOC and ODOT District 5. Also depends on communications installed to field devices.	$200,000/ $125,000	● Information sharing capabilities ● Back-up capabilities ● More effective traffic management, incident management, and maintenance management ● Safety and efficiency improvements	Requires communications between City of Eugene, City of Springfield, Lane County, ODOT District 5, and the NWTOC.
ES-TM-02	Regional Freeway Surveillance and Management	Project will develop and deploy an integrated multi-jurisdictional regional freeway surveillance and management system that provides for traffic-responsive freeway control and sharing of roadside subsystems.	H, M, L	See Related ES-TM-02 Projects.	See Related ES-TM-02 Projects.	See Related ES-TM-02 Projects.	● Integration of multi-jurisdictional freeway and arterial systems ● Improved safety and efficiency of freeways, therefore reducing delay and emergency response times ● More effective traffic management, incident management, and maintenance management ● Timely and cost-effective complaint response ● Increase in information available to travelers through DMS and the TripCheck web site ● Availability of additional volume, speed, and occupancy data	See Related ES-TM-02 Projects.
ES-TM-02A	I-5 Freeway Surveillance and Management	Project includes the installation of the following devices on I-5:		*TransPlan* Projects #250 & 606; ES-TM-07A	Requires communications connection to the NWTOC and ODOT District 5.	$4,900,000/ $125,000		Improvements at I-5/Beltline Hwy can be incorporated with planned capital improvements.
		● CCTV Cameras	H, M, L					
		● DMS	H, M					
		● System-Wide Ramp Meters & System Detection	L					
		● Curve Warning System	H					
ES-TM-02B	Beltline Highway Freeway Surveillance and Management	Project includes CCTV cameras, DMS, system-wide ramp meters, and system detection on the following corridors:		*TransPlan* Projects #312, 409, 506, 606, 607, 622 & 638; ES-TM-07C	Requires communications connection to the NWTOC and ODOT District 5.	$6,100,000/ $175,000		Parts of this project can be incorporated with planned capital improvements.
		● River Rd to I-5	H					
		● Barger Rd to NW Expressway	M					
		● W 11th Ave to Barger Rd	L					
ES-TM-02C	Eugene-Springfield Highway (OR 126) Freeway Surveillance and Management	Project includes the installation of the following field devices:		*TransPlan* Projects #96, 821 & 835; ES-TM-07B	Requires communications connection to the NWTOC and ODOT District 5.	$3,400,000/ $100,000		Parts of this project can be incorporated with planned capital improvements.
		● CCTV Cameras	H, M					
		● DMS	L					
		● System-Wide Ramp Meters & System Detection	L					
ES-TM-02D	I-105 Freeway Surveillance and Management	Project includes CCTV cameras, DMS, system-wide ramp meters, and system detection at the following locations:		*TransPlan* Project #151; ES-TM-07B	Requires communications connection to the NWTOC and ODOT District 5.	$1,620,000/ $40,000		Parts of this project can be incorporated with planned capital improvements.
		● Delta Hwy Interchange	M, L					
		● Coburg Rd Interchange	M, L					
ES-TM-02E	Delta Highway Freeway Surveillance and Management	Project includes CCTV cameras, ramp meters, and system detection.	M	*TransPlan* Project #638	Requires communications connection to the NWTOC and Lane County.	$980,000/ $35,000		The close proximity of Lane County's offices to Delta Highway will cut down on communications costs.
ES-TM-03	Regional Arterial Surveillance and Management	Project will develop and deploy an integrated multi-jurisdictional regional arterial surveillance and management system that provides for traffic-responsive corridor management and sharing of roadside subsystems.	H, M, L	See Related ES-TM-03 Projects.	See Related ES-TM-03 Projects.	See Related ES-TM-03 Projects.	● Integration of multi-jurisdictional arterial systems	See Related ES-TM-03 Projects.

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-TM-03A	Pacific Highway (OR 99) Arterial Surveillance and Management	Project includes the following deployment elements:		ES-TM-07C	Requires communications to the City of Eugene Public Works Office and the NWTOC.	$940,000/ $40,000	● Improved safety and efficiency of arterial corridors, therefore reducing delay and emergency response times ● More effective traffic management, incident management, and maintenance management ● Timely and cost-effective complaint response ● Increase in information available to travelers through DMS and the TripCheck web site ● Availability of additional volume, speed, and occupancy data	The City of Eugene is currently planning to replace their twisted-pair copper interconnect with fiber.
		● CCTV Cameras	M, L					
		● DMS	M					
		● System Detection	M, L					
		● Replacement of Twisted-Pair Copper with Fiber Interconnect	M					
		● Signal Timing Coordination	M, L					
ES-TM-03B	River Road Arterial Surveillance and Management	Project includes the following deployment elements:		Lane County *CIP* Projects; ES-TM-07C	None	$110,000/ $15,000		Parts of this project can be incorporated with planned capital improvements.
		● System Detection	L					
		● Signal Timing Coordination	M, L					
ES-TM-03C	Coburg Road Arterial Surveillance and Management	Project includes the following deployment elements:		*TransPlan* Project #619; ES-TM-07A; ES-TM-07C	Requires communications to the City of Eugene Public Works Office and the NWTOC.	$470,000/ $30,000		The traffic signals are already interconnected and are part of the City of Eugene's QuicNet traffic signal system.
		● CCTV Cameras	H					
		● System Detection	H					
		● Signal Timing Coordination	H					
ES-TM-03D	6th Avenue/7th Avenue Arterial Surveillance and Management	Project includes the following deployment elements:		*TransPlan* Project #133; ES-TM-07A; ES-TM-07B; ES-TM-07C	Requires communications to the City of Eugene Public Works Office and the NWTOC.	$90,000/ $6,000		The traffic signals are already connected to the City of Eugene's QuicNet traffic signal system.
		● CCTV Cameras	M, L					
		● System Detection	L					
ES-TM-03E	W 11th Avenue (OR 126) Arterial Surveillance and Management	Project includes the following deployment elements:		*TransPlan* Projects #332 & 333	Requires communications to the City of Eugene Public Works Office and the NWTOC.	$780,000/ $35,000		The traffic signals are already interconnected and are part of the City of Eugene's QuicNet traffic signal system.
		● CCTV Cameras	L					
		● DMS	M					
		● System Detection	L					
		● Signal Timing Coordination	L					
ES-TM-03F	Franklin Boulevard (OR 126 Bus) Arterial Surveillance and Management	Project includes the following deployment elements:		City of Eugene *Downtown Vision Study*; ES-TM-07A; ES-TM-07B	Requires communications to the City of Eugene Public Works Office and the NWTOC.	$500,000/ $20,000		The traffic signals are already interconnected and are part of the City of Eugene's QuicNet traffic signal system.
		● CCTV Cameras	L					
		● DMS	L					
		● System Detection	L					
		● Signal Timing Coordination	M, L					
ES-TM-03G	Main Street/A Street (OR 126 Bus) Arterial Surveillance and Management	Project includes the following deployment elements:		*TransPlan* Projects #69, 75 & 838; ES-TM-07A; ES-TM-07B; ES-TM-10	Requires interconnect to signals east of 28th St and communications to the City of Springfield Public Works Office and the NWTOC.	$1,220,000/ $60,000		The traffic signals west of 28th St are already interconnected and are part of the City of Springfield's QuicNet traffic signal system.
		● CCTV Cameras	M, L					
		● DMS	M					
		● System Detection	M, L					
		● Signal Timing Coordination	M, L					
ES-TM-03H	Pioneer/MLK Parkway Arterial Surveillance and Management	Project includes system detection.	L	*TransPlan* Project #768; ES-TM-07A; ES-TM-07B	None	$510,000/ $25,000		Part of this project can be incorporated with the planned MLK Parkway construction.
ES-TM-03I	West Eugene Parkway Arterial Surveillance and Management	Project includes CCTV cameras, signal interconnect, and system detection that should be incorporated in the design of the West Eugene Parkway.	H, M	*TransPlan* Project #336	None	$360,000/ $20,000		This project can be incorporated with the design of West Eugene Parkway, a brand new roadway.
ES-TM-04	Reversible Lane Management on MLK/Centennial Boulevard	Project includes the deployment of reversible lane controls on MLK/ Centennial Boulevard for special events or emergency situations.	M	*TransPlan* Projects #818, 924, 927, & 930	Requires communications to the City of Eugene Public Works Office and an interface with affected traffic signals.	$600,000/ $5,000	● Improved use of existing capacity ● Improved safety and efficiency during special event management	This project will require software training.
ES-TM-05	Gateway Area Traffic Responsive Signal Timing	Project includes traffic responsive signal timing development, system detection deployment, and transmission of existing video detection images back to the City of Springfield's Public Works' office.	H	None	None	$130,000/ $7,500	● Improved safety and efficiency of the corridor, therefore reducing delay and emergency response times ● Reduced congestion	The traffic signals along Gateway Street are already interconnected as well as connected to the City of Springfield's central signal system.

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-TM-06	30th Avenue Signal Timing Coordination near I-5	Project includes signal timing coordination of the two traffic signals on 30th Avenue at the east end of Lane Community College. Conduit currently exists between these two signals.	H	None	None	$10,000/ $750	• Improved safety and efficiency • Reduced congestion and delay	Empty conduit is available between these two signals for the installation of interconnect cable.
ES-TM-07	Incident Management Operational Plans	Project includes the development of an incident management operational plan that includes the operational protocol for field devices (ie. CCTV cameras, DMS, and system detection on mainline and alternate routes), the development of incident signal timing plans on alternate arterial routes, and clearly defined agency roles and responsibilities for the following corridors:	H, M, L	ES-TM-01; ES-TM-02; ES-TM-03	Requires deployment of field devices and communications infrastructure. Some field devices or communications equipment may be installed as part of other freeway and arterial surveillance and management projects.	Note: All costs for field devices are included in ES-TM-02 and ES-TM-03.	• Availability of real-time freeway and arterial corridor information during incidents • Increased capacity and throughput during incident conditions • Improved integration of regional freeway systems with local signal systems • Reduction in congestion and delay due to incidents • Reduced incident response times • Improved safety and efficiency	ODOT Region 1 and the City of Portland have successfully developed and deployed an incident management operational plan on the I-5/Barbur Boulevard corridor. - Alternate routes and some operational procedures have already been established for I-5 as part of the Major Incident Management Plan. The operational plan for I-5 can expand on this and focus on the metropolitan area.
ES-TM-07A		• I-5 (Alternate routes previously identified by local agencies)				$65,000/ $0		
ES-TM-07B		• Eugene-Springfield Highway				$55,000/ $0		
ES-TM-07C		• Beltline Highway				$85,000/ $0		
ES-TM-08	Incident Notification System	Develop an incident notification system that alerts subscribers when incidents occur as well as the location, the transportation impacts, and the expected duration. Subscribers may include public agencies as well as private companies such as companies representing the media.	H	None	Requires deployment of field devices and communications infrastructure to detect and verify incidents.	$70,000/ $0	• Availability of real-time incident information • Media broadcast capabilities • Reduced congestion and delay • Customer satisfaction	ODOT Region 1 has successfully implemented a pager-based notification system that could be used as a model for the Eugene-Springfield metropolitan area.
ES-TM-09	Transit Signal Priority	Give priority at traffic signals only to buses that are behind schedule to support transit operations and schedule adherence. This project includes installing transit priority on the transit fleet as well as upgrading Opticom and traffic signal controllers (as needed) at traffic signals and developing signal timing plans on key corridors.		None	Requires upgrade to 700 series Opticom detectors at traffic signal with older models. Also requires the installation of emitters on the transit fleet.		• Reduced transit delay • Schedule adherence and reliability • Reduced operational costs • Enhanced transit service • Increased ridership	TriMet and the City of Portland have successfully deployed the technology on several corridors in the City of Portland.
		• Outfit transit fleet with transit priority emitters.	H,M,L			$500,000/ $7,500		
		• Franklin Blvd, Main St/S A St, Pioneer/MLK Pkwy, Gateway St, Game Farm Rd N, Harlow Rd	H			$300,000/ $1,000		
		• Coburg Rd, Crescent Ave, Harlow Rd	M			$55,000/ $1,000		
		• Centennial/MLK Blvd, Pacific Hwy, W 11th Av, W 13th Av, W 18th Av, River Rd, Pearl St, Willamette St, Amazon	L			$95,000/ $1,000		
ES-TM-10	Traffic Signal Interconnect	Install traffic signal interconnect and connect the signals to the QuicNet system at the following locations:	H, M, L		None	$1,000,000/ $10,000	• Capability for advanced operations and more flexibility • Provides technology needed for other ITS projects in this plan	Sections of traffic signal interconnect can be added to the main system when other nearby projects are constructed. - Traffic signal interconnect should be included as part of the design of the new Jasper Road extension.
		• Valley River Dr/Willagillespie Rd/ Goodspasture Island Rd		ES-TM-02E				
		• Barger Rd		ES-TM-03A				
		• Royal Av/Roosevelt Blvd		ES-TM-03A				
		• Cal Young Rd/Gilham Rd		ES-TM-03C				
		• Green Acres Rd/Crescent Av		ES-TM-02E				
		• Chambers St		None				
		• Main St (28th Av to 69th Av)		ES-TM-03G				
		• Jasper Rd Extension		*TransPlan* Project #66				

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-TM-11	Integrate Regional Virtual TOC with UO SOS Room	Provide an interface between the Regional Virtual TOC and the UO SOS Room that allows for two-way information sharing, monitoring, and control functions.	M	ES-TM-01; ES-TM-04	Requires communications between the Regional Virtual TOC and the UO SOS Room.	$100,000/ $1,000	• Information sharing capabilities • More effective special event management	The development of the interface will be similar to the emergency management systems interface that will be developed as part of ES-EM-01
ES-TM-12	Beltline Highway Queue Warning System	Deploy a queue warning system on eastbound and westbound Beltline Highway near the Willamette River that includes dynamic signing to warn drivers of upcoming queues.	H, M	ES-TM-02B	None	$85,000/ $7,000	• Improved safety • Reduced amount of rear-end collisions	This project only requires communications between field devices and only requires communications to the NWTOC if permanent DMS are incorporated.
ES-TM-13	I-5 Bridge Security	Project includes the deployment of a bridge surveillance system on the McKenzie River and Willamette River I-5 bridges.	H	I-5 Bridge Reconstruction	Needs to be deployed during I-5 bridge reconstruction.	$430,000/ $6,000	• Surveillance and monitoring capabilities • Improved homeland security	FHWA plans to issue a technical advisory in 2004 regarding bridge security technology.
ES-TM-14	I-5 Bridge Weather Detection and Deicing System	Project includes the installation of a weather detection system and an automatic deicing system on the McKenzie River and Willamette River I-5 bridges.	H	I-5 Bridge Reconstruction	Needs to be deployed during I-5 bridge reconstruction.	$540,000/ $22,000	• Real-time weather and pavement conditions • More efficient allocation of maintenance resources during inclement weather	This project can be incorporated with the design of the two I-5 Bridge modifications.
ES-TM-15	Highway Advisory Radio (HAR)	Deploy a highway advisory radio system that provides traveler information. Project includes both permanent and mobile installations. Permanent installations will be deployed at the five key entry points to the metropolitan area (north, northwest, south, east, and west) and at key central locations.	H	2004 – 2007 Draft STIP Key #12942	Depends on deployment of field equipment (CCTV cameras, system detectors, weather stations, etc…) to collect traveler information.	$350,000/ $10,000	• Real-time traveler information • En-route information that allows users to make informed travel decisions • Reduced congestion and delay • Customer satisfaction	WSDOT has implemented highway advisory radio in southern Washington and can be used as a resource during design and construciton.
ES-TM-16	Integrate Regional Traveler Information with TripCheck, 511, and Highway Advisory Radio	Develop an integrated system for disseminating and posting traveler information to TripCheck, 511, and HAR.	H, M, L	National/State 511 Deployment Project; ES-TM-15 (2004 - 2007 Draft STIP Key #12942)	Depends on deployment of field equipment (CCTV cameras, system detectors, weather stations, etc…) to collect traveler information.	$385,000/ $10,000	• Real-time and static traveler information • Pre-trip planning capabilities and en-route information that allow users to make informed travel decisions • Reduced congestion and delay • Customer satisfaction	Requires an interface between agencies in the Eugene-Springfield metropolitan area to TripCheck, the 511 system, and the HAR system.
ES-TM-17	Congestion/ Incident Information Mapping	Develop an incident and congestion flow mapping system that shows travel speeds on study area roadways.	H, M, L	ES-TM-02; ES-TM-03	Depends on deployment of system detectors to monitor travel speeds along roadways. Also depends on an interface with incident management personnel.	$290,000/ $5,000		The WSDOT Smart Trek (www.smarttrek.org) congestion and incident mapping system can be used as a model for the Eugene-Springfield metropolitan region.
ES-TM-18	Traveler Information at Rest Areas	Provide real-time traveler information at rest areas north and south of the metropolitan area: • Oak Grove Rest Area (MP 207) • Gettings Creek Rest Area (MP 177)	M	ES-TM-16	Depends on deployment of field equipment (CCTV cameras, system detectors, weather stations, etc…) to collect traveler information.	$290,000/ $10,000	• Pre-trip planning capabilities that allow users to make informed travel decisions prior to entering the metropolitan area • Reduced congestion and delay • Customer satisfaction	Real-time information can be disseminated by an internet link to ODOT's TripCheck web site and/or by a sign advertising the 511 traveler information phone number.
ES-TM-19	Rest Area Surveillance System	Deploy security surveillance systems, including several cameras, at rest areas north and south of the metropolitan area: • Oak Grove Rest Area (MP 207) • Gettings Creek Rest Area (MP 177)	L	None	None	Cost Included in ES-TM-18	• Surveillance and monitoring capabilities • Improved security	ODOT Region 1 is currently installing security cameras on the I-5 Columbia River Bridge and similar technology will apply to the rest areas.

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-TM-20	Advanced Parking Management and Information System	Deploy a parking management system at the following locations to collect real-time parking status information, provide en-route driver information, and electronically manage access to parking facilities: ● Planned UO Basketball/Event Center ● UO Autzen Stadium ● Lane Community College ● Eugene Airport	L	UO plans to construct a new Basketball/Event Center on their campus in downtown Eugene.	None	$750,000/ $20,000	● Real-time information so travelers can make informed decisions about mode choice and parking ● Reduced congestion and air pollution near parking lots ● More efficient use of parking spaces ● Reduced driver frustration when looking for parking	This project will require training staff at the University of Oregon, Lane Community College, and the Eugene Airport.
ES-TM-21	Road Weather Information Systems (RWIS or "Weather Stations")	Deploy road weather information sites that provide temperature and road conditions at the following locations: ● Beltline Highway on the Willamette River Bridge ● I-5 at Coburg Road	M, L	*TransPlan* Project #506	None	$140,000/ $5,000	● Real-time weather and pavement conditions ● More efficient allocation of maintenance resources during inclement weather	ODOT has previous experience with weather stations. - The Beltline Hwy RWIS can be incorporated with planned capital improvements.
ES-TM-22	Advanced Railroad At-Grade Crossings	Detection of an approaching train will allow the dissemination of advance information to emergency management personnel and travelers to allow them to make an informed decision about route choice. Deployment locations include: ● 28th St/Main St Crossing ● Centennial Blvd east of 28th St (not yet constructed) ● Olympic Blvd east of 28th St ● Irving Rd west of Northwest Expwy ● Irvington Rd west of Northwest Expwy ● 42nd St at Weyerhouser	L	*TransPlan* Project #930	None	$700,000/ $10,000	● Enhanced safety ● Real-time railroad activity information ● Alternate route information for travelers ● More efficient allocation of emergency response vehicles ● Reduced emergency response times ● More efficient transit routing	May be difficult to coordinate with railroad companies for the deployment of detectors within railroad right-of-way. Local agencies may be able to place detectors outside of the railroad right-of-way if the railroad companies are not cooperative. - The Centennial Blvd crossing can be incorporated with planned capital improvements.
ES-TM-23	Integrate Freeway Management Systems with Central Signal Systems	Integrate freeway management systems with the City of Eugene and City of Springfield central signal systems to provide seamless traffic flow between freeways and arterials, particularly during incident management.	L	ES-TM-02; ES-TM-06; ES-TM-07; ES-TM-27	This project should not be implemented until freeway management systems (Project ES-TM-02) are being deployed.	$1,100,000/ $40,000	● Integration of freeway and arterial systems ● Improved safety and efficiency, therefore reducing delay and emergency response times	The project will require software integration between freeway management systems and each City's central signal system.
ES-TM-24	Upgrade Central Signal System	Upgrade or replace the City of Eugene's and City of Springfield's central signal systems with a central signal system that can be integrated with transit systems (ie. AVL) and emergency management systems (ie. AVL)	L	ES-PTM-06	This project should not be implemented until the City of Eugene and the City of Springfield determine it is feasible to replace their current QuicNet central signal systems.	$505,000/ $20,000	● More efficient preemption of traffic signals ● Reduced emergency response times ● Improved transit schedule adherance	When the central signal system is upgraded, the technology will need to be available to integrate the signals with transit systems and emergency management systems.

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-TM-25	Special Event Management Systems	Project includes the deployment of traffic signal timing plans, portable dynamic message signs, and parking management for the following special events: ● UO Sporting Events ● Lane County Fair ● Oregon Country Fair ● Eugene Celebration ● Springfield Cruise ● Springfield Christmas Parade ● Other Regional Special Events	L	ES-TM-02; ES-TM-03; ES-TM-04; ES-TM-20	None	$350,000/ $125,000	● Improved safety and efficiency, therefore reducing delay and emergency response times ● More effective traffic management and special event management ● Increase in information available to travelers through DMS and the TripCheck web site	Many of the traffic signals in downtown Eugene and Springfield and near UO where many special events take place are already interconnected, which means special event signal timing plans can be implemented without having to deploy communications infrastructure.
ES-TM-26	Integrate Eugene Airport Traveler Information with NWTOC	Provide traveler information about Eugene-Springfield roadways at the airport and provide airport information to travelers via TripCheck and dynamic message signs operated by the NWTOC.	L	ES-TM-16	Requires communications link and interface between the Eugene Airport and the NWTOC.	$280,000/ $20,000	● Real-time and static traveler information ● Pre-trip planning capabilities and en-route information that allow users to make informed travel decisions ● Reduced congestion and delay ● Customer satisfaction	Other agency interfaces are being developed as part of the ITS Deployment Plan that can be used as models for interface development.
ES-TM-27	Develop Evacuation Route Plan	Develop an operational plan for an evacuation of the metropolitan area in the case of a major emergency.	H	Lane County Hazard Mitigation Plan; ES-TM-02; ES-TM-02; ES-TM-07	None	$120,000/ $0	● Increased capacity and throughput during emergency evacuation conditions ● Improved safety and efficiency	This project should be included as part of the Lane County Hazard Mitigation Plan and should address ITS elements.
Communications (CO)								
ES-CO-01	Document Communications Design Standards	Document design standards for communications in the following areas to ensure standardization, compatibility, connectivity, and reliability between multiple jurisdictional agencies: ● Conduit construction ● Cable plant description ● Minimum number of fibers ● Network technology ● Junction boxes ● Fiber termination panels ● Fiber connectors ● Communication hub design ● Fiber optic testing specification ● Fiber optic installation specification ● End electronics	H	This project is essential for ensuring that the communications deployed with other projects in this ITS plan are consistent throughout the metropolitan area and with other regional agencies such as PAN and other fiber consortiums.	None	$75,000/ $2,500	● Set of standards ready for implementation on all new projects or reconstruction projects ● Standardization for multiple regional agencies	This documentation will establish the technical aspects required for establishing a communications network.
ES-CO-02	Communications Network	Provide a communications network throughout the Eugene-Springfield metropolitan area to allow communications between regional agencies and also ITS devices in the field.	H, M, L	This project is relative to most of the projects included in this ITS plan.	Each piece of the communications network is dependent on the pieces that link the communications line and field equipment back to the NWTOC or ODOT District 5 Offices.	$5,400,000/ $50,000	● Connection between agencies will allow for multi-jurisdictional control, management, coordination, and information sharing ● Connection to ITS field devices allows for innovative strategies such as arterial management and incident management	Requires the purchase of fiber optic maintenance tools and staff training for fiber maintenance for all new capital fiber installation.

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-CO-03	Radio Infrastructure Integration	Develop a system for radio infrastructure expansion and sharing amongst regional agencies.	H	LTD Planned Radio Infrastructure Expansion	None	$2,300,000/ $50,000	• Expanded communications coverage • Infrastructure cost-sharing	Intergovernmental agreements relating to operations and maintenance will need to be set up to enable sharing of radio infrastructure.
Public Transportation Management (PTM)								
ES-PTM-01	Real-Time Customer Information Displays	Deploy real-time dynamic message signs at key locations such as transit centers, park and rides, bus stops where multiple routes pass through, and at bus stops with large bus headways.	H, M, L	None	None	$1,055,000/ $190,000	• Real-time transit information to aid travelers with en-route planning • Better information during service disruptions • Reduction of perceived waiting times • Removal of traveler "uncertainty" • Improved customer satisfaction	TriMet has successfully implemented real-time customer information displays in the Portland metropolitan area using simple wireless communications.
ES-PTM-02	Portable Real-Time Customer Information Displays	Acquire and deploy portable real-time dynamic message signs for special events that include transit service.	H	ES-PTM-01	The systems interface between the displays and the transit fleet will be developed as part of ES-PTM-01.	$30,000/ $4,000		
ES-PTM-03	Integrate Transit Traveler Information with ODOT Transit Trip Planning Project	Integrate transit traveler information with the transit trip planning web site ODOT is currently developing.	H	ODOT Regional Trip Planner Project	None	$350,000/ $2,000	• Real-time transit information to aid travelers with pre-trip planning • Removal of traveler uncertainty • Improved customer satisfaction	The interface with LTD will be based on the statewide infrastructure ODOT develops as part of its Transit Trip Planning Project.
ES-PTM-04	Transit Buses as Traffic Probes	Use buses as traffic probes to determine travel speeds on key corridors for congestion monitoring and data collection and analysis purposes.	M, L	The roadways designated for arterial surveillance and management as part of ES-TM-03 should be the primary locations for the collection of traffic probe data.	None	$220,000/ $2,500	• Improved surveillance and congestion information on arterials • More effective traffic management, incident management, and maintenance management • Reduced data collection costs	TriMet has been testing this technology in the City of Portland.
ES-PTM-05	Electronic Fare Collection	Install an electronic fare collection system on the entire fleet of LTD buses.	H	None	None	$1,000,000/ $6,000	• Ability to automate data collection process, which enhances planning efforts • Improved service and customer satisfaction	LTD will need to research the existing technologies to determine what works best with their fleet. The RFP to begin this study is anticipated for release in 2004.
ES-PTM-06	Automated Vehicle Location (AVL), Computer Aided Dispatch (CAD) and Automated Passenger Counting (APC) System for Fixed Route	Project implementation currently underway. Systems Acceptance anticipated for 2004.	H	This project is the 2002 – 2005 STIP Key #11366	None	$2,000,000/ $5,000	• More efficient allocation of transit resources • Improved transit travel times • Ability to automate data collection process, which enhances planning efforts	LTD is currently testing their new AVL/CAD/APC system and has TriMet available as a resource.
ES-PTM-07	Transit Fleet Maintenance	On-board system integration with vehicle diagnostics system and on-board computer (or vehicle logic unit) and wireless communications. Back office system includes vehicle maintenance software and integration with existing systems.	M	None	None	$200,000/ $5,000	• More efficient allocation of transit resources • Improved maintenance management	LTD is currently exploring technology options for this project.

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ES-PTM-08	Automated Vehicle Location (AVL) System and Computer Aided Dispatch (CAD) System for Paratransit	Integration of CAD/AVL system developed by paratransit contractor with fixed route system. Expansion of vehicle location equipment to all paratransit vehicles fleet-wide.	M	ES-PTM-06	ES-PTM-06	$500,000/ $1,000	• More efficient allocation of transit resources • Improved transit travel times	LTD paratransit contractor has developed a CAD/AVL system in-house. LTD wishes to integrate this with the fixed route system and expand fleet-wide.
ES-PTM-09	System Security and Integration of Bus Video Images with LTD Dispatch	Develop a system for transmitting video images from transit stations and buses back to LTD Dispatch for surveillance capabilities of the stations, roadway and passengers.	M	None	Requires fiber/communications connectivity between transit stations and LTD Dispatch system.	$1,500,000/ $25,000	• Improved surveillance and monitoring capabilities • Increased security for passengers both on-board and waiting at transit stations	LTD buses and some transit facilities already include video systems. Project would require upgrade to wireless communictaions system to support video transport.
ES-PTM-10	Bus Rapid Transit (BRT)	LTD is currently developing a BRT system for the Eugene-Springfield metropolitan area that utilizes buses to increase service frequency, capacity, and speed.	H, M, L	This project is the 2002 - 2005 STIP Keys #11362, 11363, 11364, 11371, 11372, 12251, 12252, 12258	None	Final BRT system costs will be determined by LTD.	• Faster, more convenient transit service • Alternative to single-occupant vehicle • Customer satisfaction	LTD is currently planning and researching BRT implementation.
Emergency Management (EM)								
ES-EM-01	Integration Between Traffic/Transit Management Systems and Emergency Management Systems	Provide a two-way information flow (ie. CCTV camera images, congestion flow map, emergency calls) between transportation management systems (NWTOC, Virtual TOC, LTD, and UO SOS Room) and the metropolitan area 911 and emergency dispatch centers: • Central Lane 911 • Oregon State Police • Springfield Police Department • Coburg Police Department • Lane County Sheriff's Office	M	ES-TM-01	A software interface will be required at the 911 and emergency dispatch centers, the traffic management centers, and the transit management systems for access between systems.	$1,350,000	• Improved real-time traffic conditions information • Information sharing between agencies • More efficient allocation of emergency response resources • Reduced emergency response times	ODOT and the Bureau of Emergency Communications (BOEC) are currently working on a proof-of-concept for 911 center integration. Evaluation of this proof-of-concept will help with 911 and emergency dispatch center integration in the Eugene-Springfield metropolitan area.
ES-EM-02	Provide Interface Between Traffic Management Systems and Emergency Operations Centers (EOC's)	Provide an interface between the Regional Virtual TOC or other traffic management systems and each of the regional emergency operations centers to allow access to traffic control devices during emergency situations at the EOC's as well as to share information between agencies. This project includes workstations, monitors, and a communications interface at the following EOC's: • Eugene EOC • Springfield EOC • Coburg EOC • Lane County EOC • Planned ODOT EOC	M	ES-TM-01; ES-EM-01	A software interface will be required at the emergency operations centers, the traffic management centers, and the transit management centers for access between systems.	$75,000	• Improved real-time traffic conditions information • Information sharing between agencies • More efficient allocation of emergency response resources • Reduced emergency response times	The ES-EM-01 project regarding public safety integration will provide the basis for the deployment of regional emergency operations center integration.
ES-EM-03	Traffic Adaptive Emergency Response	Deployment of the "Right Route" en-route emergency guidance system (static route plan) throughout the metropolitan region. Project also includes interface between automated vehicle locators (AVL) on emergency vehicles and traffic signals.	M	LCOG's Right-Route Demonstration Project	Requires an interface between AVL and traffic signals.	$420,000/ $10,000	• Improved static traffic route information • Reduced emergency response times	LCOG has already developed the technology and implemented a limited amount of equipment in rural areas. This same technology applies to the urban area.
ES-EM-04	Integration of Traffic Management Information with Mobile Data Terminals	Provide real-time traffic information to mobile data terminals housed in emergency response vehicles. Inventory existing emergency vehicle fleet to determine how many additional mobile data terminals need to be installed and install these as necessary.	L	ES-EM-03	None	$200,000/ $10,000	• Improved real-time traffic conditions information • Reduced emergency response times	A number of emergency response vehicles already include in-vehicle mobile data terminals.

Table 5. Proposed Deployment Projects

Project Number	Project Title	Project Description	Priority	Relativity to Planned Projects	Project Dependencies	Capital Costs/ O&M Costs[1]	Expected Benefits	Technical and Institutional Feasibility
ES-EM-05	Incident Response Fleet Management System	Installation of automated vehicle locators (AVL) on incident response vehicles and dissemination of real-time vehicle locations at the NWTOC, and the emergency dispatch centers or EOC's for resource allocation during incidents or emergencies. Project also includes monitoring of incident response vehicle repairs and vehicle replacement schedules.	L	None	None	$350,000/ $80,000	• More efficient management of incident response fleet • Reduced emergency response times when incident response support is needed	LTD is currently installing automated vehicle locators on its transit fleet and will be a valuable resource for project implementation.
Information Management (IM)								
ES-IM-01	Regional Data Management System	Create a data management system for archiving data, collecting real-time data, and accessing data. The system should have geospatial capabilities and data should include traffic counts, speed data, accidents (vehicles, pedestrians, and bicycles), traffic enforcement data, and incident information.	M	This project closely relates to projects that deploy field devices and systems to collect transportation related data; ES-TM-01; ES-TM-02; ES-TM-03; ES-PTM-05; ES-PTM-06; ES-PTM-09	This project is dependent on interagency communications and the deployment of field devices to collect data.	$560,000/ $50,000	• Improved resources for regional modeling, research, analysis, planning, and design • Reduced cost of data collection	This project will make use of data already collected or planned for collection by agencies in the Eugene-Springfield metropolitan area.
ES-IM-02	Integrate Transportation Information with GIS Centerline Project	Update ITS transportation GIS data in accordance with the GIS Centerline Project once it is complete.	H, M, L	GIS Centerline Project	None	$50,000/ $5,000	• Improved mapping capabilities • Improved resources for analysis, planning, and design	The GIS Centerline Project is in the process of combining roadway centerline data and developing regional standards for creating attributable data.
Maintenance & Construction Management (MC)								
ES-MC-01	Maintenance Fleet Management System	Installation of automated vehicle locators (AVL) on maintenance vehicles and dissemination of real-time vehicle locations at the ODOT District 5 Office and emergency dispatch centers or EOC's for resource allocation during incidents or emergencies.	L	None	None	$170,000/ $5,000	• More efficient managagement of maintenance fleet • Reduced emergency response times when maintenance support is needed	LTD is currently installing automated vehicle locators on its transit fleet and will be a valuable resource for project implementation.
ES-MC-02	Construction Zone Safety Enhancements During I-5 Bridge Reconstruction	Deploy permanent and/or portable dynamic message signs and electronic driver feedback signs to alert motorists of their travel speed as they approach the work zone for the installation of the I-5 temporary bridges and reconstruction of the I-5 permanent bridges.	H	I-5 Bridge Reconstruction of the McKenzie and Willamette River Bridges	None	$200,000/ $45,000	• Improved construction zone safety and efficiency • Heightened safety awareness through driver feedback	New equipment and training would be required for this project. ODOT has acquired portable changeable speed limit signs that may be available for use on this project.
ES-MC-03	Maintenance, Construction, and Special Event Coordination System	Develop an information management system that contains details about regionwide maintenance and construction activities by public agencies, utility companies, and private contractors as well as special event information, including location and event duration.	M	None	Requires data and information from public and private agencies throughout the region.	$540,000/ $10,000	• Construction and maintenance scheduling capabilities • Improved resources for planning • Cost savings through project coordination	The system must allow for quick and easy data input and retrieval to make it efficient for affected agencies to use.
ES-MC-04	Develop Work Zone Management Standards	Develop standards for safety enhancements and management techniques in work zones such as the following: • Variable speed limits • Incident detection and management • Lane merge controls • Queue detection and electronic driver feedback signs	H	None	None	$40,000/ $0	• Improved construction zone safety and efficiency • Heightened safety awareness through driver feedback	The development of regional work zone management standards, that incorporate other statewide efforts, will make implementation easier during major construction projects. ODOT has acquired portable changeable speed limit signs that may be available for use in the region.

[1] The estimated operations & maintenance (O&M) costs listed in this table are for an annual basis once the project has been deployed

Table 6. DEPLOYMENT PLAN SCHEDULE (Page 1 of 2)

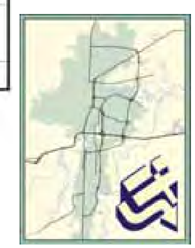
Ref. #	Project Title	Years	5-Year Plan					10-Year Plan					20-Year Plan									
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Travel & Traffic Management																						
ES-TM-01	Regional Virtual Transportation Operations Center																					
ES-TM-02	Regional Freeway Surveillance and Management																					
ES-TM-03	Regional Arterial Surveillance and Management																					
ES-TM-04	Reversible Lane Management on MLK/Centennial																					
ES-TM-05	Gateway Area Traffic Responsive Signal Timing																					
ES-TM-06	30th Avenue Signal Timing Coordination Near I-5																					
ES-TM-07	Incident Management Operational Plans																					
ES-TM-08	Incident Notification System																					
ES-TM-09	Transit Signal Priority																					
ES-TM-10	Traffic Signal Interconnect																					
ES-TM-11	Integrate Regional Virtual TOC with UO SOS Room																					
ES-TM-12	Beltline Highway Queue Warning System																					
ES-TM-13	I-5 Bridge Security																					
ES-TM-14	I-5 Bridge Weather Detection and Deicing System																					
ES-TM-15	Highway Advisory Radio (HAR)																					
ES-TM-16	Integrate Traveler Information with TripCheck, 511, & Highway Advisory Radio																					
ES-TM-17	Congestion/ Incident Information Mapping																					
ES-TM-18	Traveler Information at Rest Areas																					
ES-TM-19	Rest Area Surveillance System																					
ES-TM-20	Advanced Parking Management & Information System																					
ES-TM-21	Road Weather Information Systems (RWIS)																					
ES-TM-22	Advanced Railroad At-Grade Crossings																					
ES-TM-23	Integrate Central Signal Systems with Transit & Emergency Management Systems																					
ES-TM-24	Upgrade Central Signal System																					
ES-TM-25	Special Event Management Systems																					
ES-TM-26	Integrate Eugene Airport Traveler Information with Northwest Transportation Operations Center																					
ES-TM-27	Develop Evacuation Route Plan																					
Communications																						
ES-CO-01	Document Communications Design Standards																					
ES-CO-02	Communications Network																					
ES-CO-03	Radio Infrastructure Integration																					

Proposed Implementation
Currently Funded Projects

Table 6. DEPLOYMENT PLAN SCHEDULE (Page 2 of 2)

Ref. #	Project Title Years	5-Year Plan 1	2	3	4	5	10-Year Plan 6	7	8	9	10	20-Year Plan 11	12	13	14	15	16	17	18	19	20
Public Transportation Management																					
ES-PTM-01	Real-Time Customer Information Displays		P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
ES-PTM-02	Portable Real-Time Customer Information Displays						P	P													
ES-PTM-03	Integrate Transit Traveler Information with ODOT Transit Trip Planning Project		P	P	P	P															
ES-PTM-04	Transit Buses as Traffic Probes										P	P	P								
ES-PTM-05	Electronic Fare Collection			P	P	P															
ES-PTM-06	Automated Veh. Location, Computer Aided Dispatch & Automated Passenger Counting Sys. for Fixed Route	F	F	F																	
ES-PTM-07	Transit Fleet Maintenance									P	P	P									
ES-PTM-08	Automated Vehicle Location System and Computer Aided Dispatch System for Paratransit												P	P	P	P					
ES-PTM-09	System Security & Integration of Bus Video Images with LTD Dispatch								P	P	P										
ES-PTM-10	Bus Rapid Transit	F	F	F	F	F	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Emergency Management																					
ES-EM-01	Integration Between Traffic/Transit Management Systems & Emergency Management Systems								P	P	P										
ES-EM-02	Provide Interface Between Traffic Management Systems and Emergency Operations Centers									P	P	P	P								
ES-EM-03	Traffic Adaptive Emergency Response																P	P	P	P	P
ES-EM-04	Integration of Traffic Management Information with Mobile Data Terminals																P	P	P	P	P
ES-EM-05	Incident Response Fleet Management System																		P	P	P
Information Management																					
ES-IM-01	Regional Data Management System						P	P	P	P	P										
ES-IM-02	Integrate Transportation Information with GIS Centerline Project	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P
Maintenance & Construction Management																					
ES-MC-01	Maintenance Fleet Management System																P	P	P	P	P
ES-MC-02	Construction Zone Safety Enhancements During I-5 Bridge Reconstruction	P	P	P	P	P	P	P													
ES-MC-03	Maintenance, Construction, and Special Event Coordination System						P	P	P												
ES-MC-04	Develop Work Zone Management Standards		P	P																	

P = Proposed Implementation
F = Currently Funded Projects



Deployment Summary

To successfully implement the proposed ITS plan, the following steps are necessary:

ITS Program Continuation

The continuation of the ITS steering committee is possibly the most important item for the successful implementation of the ITS plan. This group should include the key stakeholders from the planning process and should be organized as a new subcommittee to the Transportation Planning Committee (TPC). This group will initiate the steps outlined in this plan, plan projects that fit agencies' needs, pursue Federal funding opportunities, and monitor/report progress and effectiveness. In addition, a representative from this ITS subcommittee should report current status of the plan implementation at least annually at the Metropolitan Policy Committee (MPC).

MPC

TPC

ITS Steering Committee

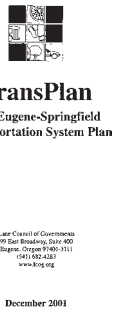
Eastbound Beltline Hwy On-Ramp at River Rd

Deploy "Early Winner" Projects

Another key to the success of ITS in Eugene-Springfield will depend on the deployment of "early winner" projects. A potential "early winner" project includes the deployment of field devices (closed circuit television cameras, count stations, variable message signs, and ramp meters) on Beltline Highway to support regional freeway management and traveler information. This project would also support the current Statewide implementation of the 511 traveler information telephone number by providing real-time information from these field devices.

Incorporate the ITS Plan in the RTP Update Process

The ITS Steering Committee plans to incorporate this ITS Plan in the upcoming Regional Transportation Plan (RTP) update process. The ITS devices and communications infrastructure identified in this plan should be installed on corridors concurrently with traditional transportation construction and maintenance projects. This approach will minimize reconstruction, save time and money, and result in the modernization of the regional transportation system. Where applicable, relationships to currently planned regional projects have been identified in Table 5. In addition, the data collection, analysis, operational techniques and information sharing developed through the projects in this plan can become key elements of other regional efforts.



Do Not Overlook Future Needs if They Fit With Current Opportunities

The region should pursue a flexible approach to implementing the plan. Opportunities may become present in early years to implement elements of the plan identified for later deployment. These opportunities may be possible due to other funding sources, coordination with roadway construction, coordination with local agency/private initiatives and/or transit priorities. These opportunities should be seized when appropriate.

Deployment Summary

Define a Revenue Stream

The Eugene-Springfield Metropolitan Area will need to define a revenue stream for construction, operations and maintenance. This plan provides the basis for the funding and identifies opportunities for regional coordination and cost-sharing. The region must dedicate funding sources to implement each increment of the 20-year plan. In addition to the traditional funding sources, other non-traditional sources for funding such as grants from non-profit agencies should be considered.

The total capital, engineering and annual operations/maintenance costs for the ITS program are provided below. The Eugene-Springfield Metropolitan Area will need an on-going commitment to operations and maintenance of the equipment and software to maximize the benefits of the ITS program. The ITS elements proposed within this program require consistent staffing for effective system operation, as well as requiring trained staff to do routine maintenance.

Implementation Stage	***Estimated Implementation Capital Costs***	***Estimated Annual Operations & Maintenance Costs***
5-Year Plan: 0 - 5 Years	$18,355,000	$735,000
10-Year Plan: 6 - 10 Years	$16,240,000	$590,000
20-Year Plan: 11 - 20 Years	$15,550,000	$660,000
TOTAL	**$50,145,000**	**$1,985,000**

Costs above are per year for the associated phase

Glossary of Terms

AVL	Automated Vehicle Location
APC	Automated Passenger Counting
BOEC	Bureau of Emergency Communications
CAD	Computer Aided Dispatch
CCTV	Closed Circuit Television
CO	Communications
DMS	Dynamic Message Sign
EM	Emergency Management
EOC	Emergency Operations Center
ES	Eugene-Springfield
FHWA	Federal Highway Administration
GIS	Geographical Information System
H	High Priority
HAR	Highway Advisory Radio
IDAS	ITS Deployment Analysis System
IM	Information Management
ITS	Intelligent Transportation System
L	Low Priority
LCOG	Lane Council of Governments
LTD	Lane Transit District
M	Medium Priority
MC	Maintenance & Construction Management
MDT	Mobile Data Terminal
MP	Milepost
MPC	Metropolitan Policy Committee
NWTOC	Northwest Transportation Operations Center
O&M	Operations and Maintenance
ODOT	Oregon Department of Transportation
PAN	Public Agency Network
PTM	Public Transportation Management
RTP	Regional Transportation Plan
RWIS	Road Weather Information System
SOS	Stadium Operaitons and Security
STIP	Statewide Transportation Improvement Plan
TOC	Transportation Operations Center
TPC	Transportation Planning Committee
TM	Travel & Traffic Management
TMA	Transportation Management Area
UO	University of Oregon
VMT	Vehicle Miles Traveled
WSDOT	Washington Department of Transportation