Executive Summary

Washington County ITS Plan

May 2005

Prepared by

DKS Associates
TRANSPORTATION SOLUTIONS

And

Zenn Associates

In Cooperation with

Washington County
The City of Beaverton
The City of Forest Grove
The City of Hillsboro
The City of Portland
The City of Sherwood
The City of Tigard
The City of Tualatin
Federal Highway Administration
TriMet
Tualatin Valley Fire & Rescue
Oregon Dept. of Transportation
WCCCA (911)

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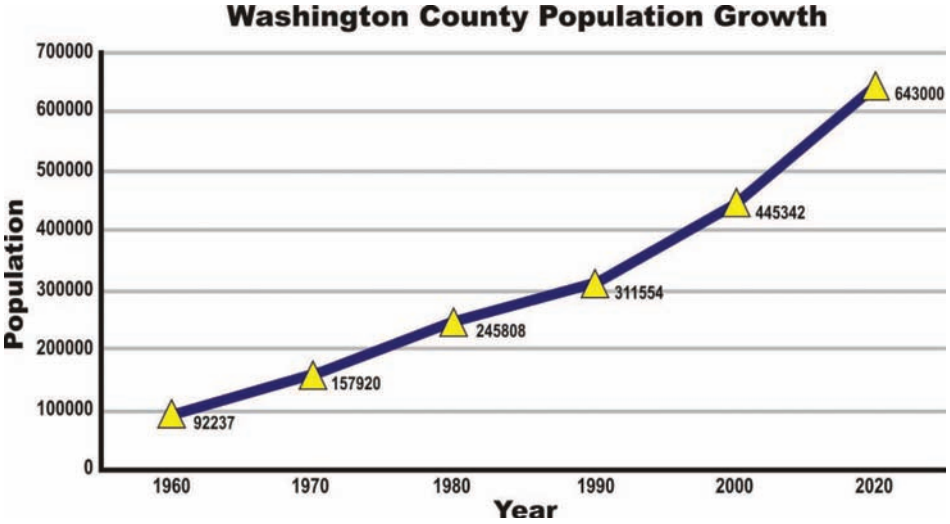
INTRODUCTION

Washington County is the second largest and one of the fastest growing urban counties in Oregon. The 2000 census indicated a 43 percent growth in population between 1990 and 2000 in the county, compared to a 24 percent growth in the state of Oregon. Forecasts for Washington County indicate that the high growth rate will continue over the next 20 years.



Significant population growth along with increasing reliance on the automobile has placed a tremendous burden on the county's transportation infrastructure. Motor vehicle travel accounts for approximately 91 percent of all travel in the county. As population increases so does the congestion. Traffic congestion within the county creates a direct impact to freight movement, emissions, travel times, fuel consumption and emergency response times. Since it is impossible to "build your way" out of congestion, it is critical to the Washington County economy and environment that the transportation system work efficiently.

Building and managing a smarter and more efficient transportation system will require cooperation between Washington County and other local agencies. For this purpose, Washington County, in partnership with ODOT, City of Beaverton, City of Tualatin, City of Tigard, City of Hillsboro, City of Portland, TriMet, FHWA, WCCCA, and Tualatin Valley Fire and Rescue, has developed an Intelligent Transportation System (ITS) Plan for the county's roadways. The plan will guide the deployment of advanced technologies and management techniques for the next five years that will improve the safety and efficiency of the transportation system. The Washington County ITS Plan was developed in a manner consistent with similar efforts in the region and state to ensure that ITS efforts throughout the state are coordinated and complementary. This document presents the Executive Summary of the Final Report.

Washington County Travel Demand

Mode	*1994*	*2020 (RTP)*	*Percent Change*
Person Trips	511,667	917,867	+ 79 %
Auto	467,672	817,204	+ 75 %
SOV*	357,139	605,609	+ 70 %
HOV**	110,533	211,595	+ 91 %
Transit	8,790	48,819	+ 455 %
Ped/Bike	35,205	51,844	+ 47 %

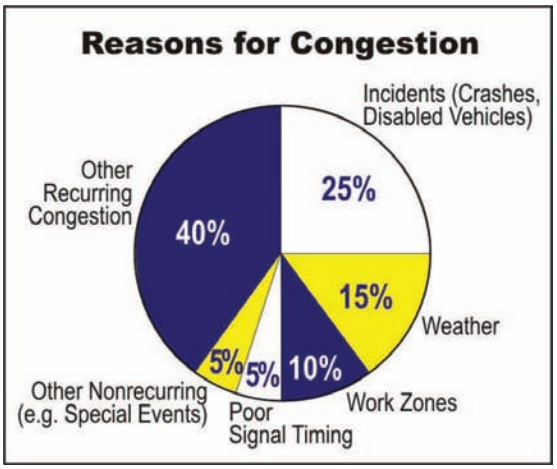
Notes:
* SOV – A Single Occupancy Vehicle is one in which the driver is traveling alone. This is a subset of the Auto category.
** HOV – A High Occupancy Vehicle is one in which there is more than one person in the car. This is a subset of the Auto category.

Source: Washington County Transportation System Plan

PROJECT BACKGROUND

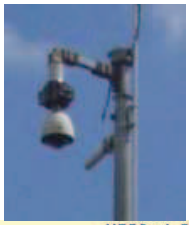
The Problem:

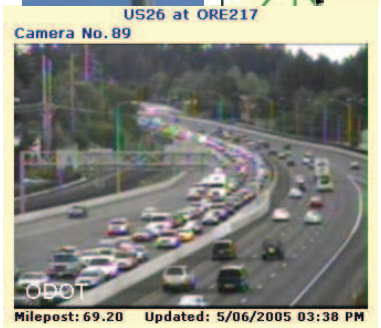
Sixty percent of congestion results from temporary disruptions to traffic flow, caused by weather, work zones, special events and incidents. This demonstrates a significant need for improvements specifically tied to these problem areas. These temporary disruptions reduce roadway capacity and unanticipated disruptions have negative effects on travel time reliability for travelers and freight carriers, thus affecting the Washington County economy. Simply building new roads and adding capacity can't solve these unexpected events. However, an integrated ITS system can help reduce the impacts and return the system to full capacity. A focus on preserving roadway capacity by managing operations and creating and implementing a coordinated ITS plan will yield the most significant benefits for these scenarios.



The Opportunity:

ITS applications offer a significant opportunity to improve the safety and efficiency of the surface transportation system in Washington County. These applications help improve transportation system operations by performing a function more quickly or by providing a service that was not previously available. ITS helps improve the mobility of people and goods on the existing roadway infrastructure and also offers the potential for substantial savings on future construction, particularly on highways. Often the importance of investing in operations is overlooked, but is necessary to ensure that the traveling public makes safe and efficient use of existing roadways.





What is ITS?

Intelligent Transportation Systems 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 by providing tools to manage congestion resulting from non-recurring events such as weather, traffic incidents and road construction. This enhances the overall system performance and reduces the need to add capacity (e.g., travel lanes). Efficiencies are 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 operate and manage the system seamlessly across jurisdiction boundaries.

Why Develop an ITS Plan?

An ITS plan provides a framework of policies, procedures, and strategies for integration of an area's existing resources to effectively meet future regional transportation needs and expectations. The reasons for developing an ITS plan for Washington County include:

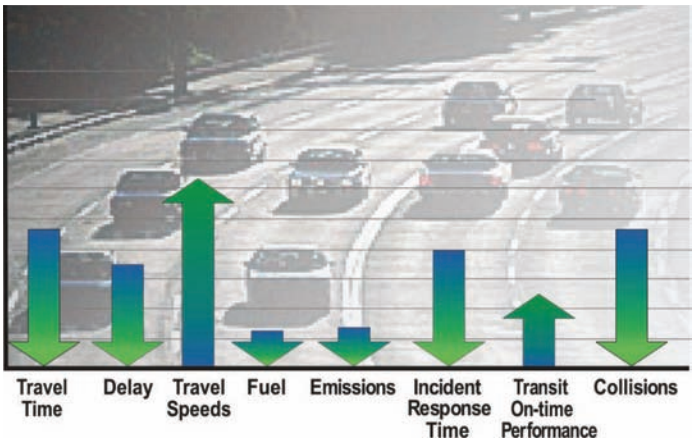
- The region cannot build itself out of congestion.
- The region endeavors to maximize the efficiencies and improve the

safety of the existing infrastructure.
- The public demands better information about traffic congestion.
- The plan fosters multi-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 congestion
- Reducing collisions and incident response times
- Providing travelers with real-time information to make informed route and mode choices



Quantifiable benefits resulting from Intelligent Transportation Systems include:

- Reduced vehicle delays
- Reduced collisions
- Improved air quality
- Reduced fuel consumption
- Improved travel times
- Improved freight mobility

Another benefit, which is more difficult to quantify, involves reducing driver frustration and anxiety by providing real-time travel information. Additionally, improving efficiency by coordinating agency actions can produce long-term savings, particularly in relation to coordinating regional projects and regional response to incidents. ITS deployments around the state of Oregon have yielded many of these benefits; some of which are highlighted below.

Coordinated Signal Timings

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

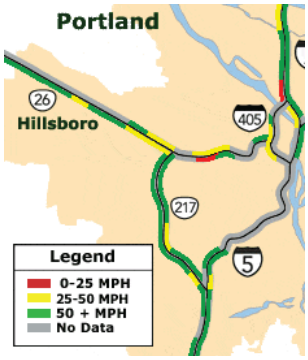
- 10- to 40-percent reduction in stops
- 15- to 45-percent reduction in delay
- 5- to 25-percent reduction in travel time
- Up to 15-percent reduction in fuel consumption

Incident Management

The Oregon Department of Transportation, in association with the Oregon State Police, operates an incident management program in Region 1 to assist disabled vehicles.

The incident management program includes response vehicles that patrol the Region 1 roadways to assist motorists and reduce the duration of incidents and the resulting traffic congestion. The benefits of the incident management program include:

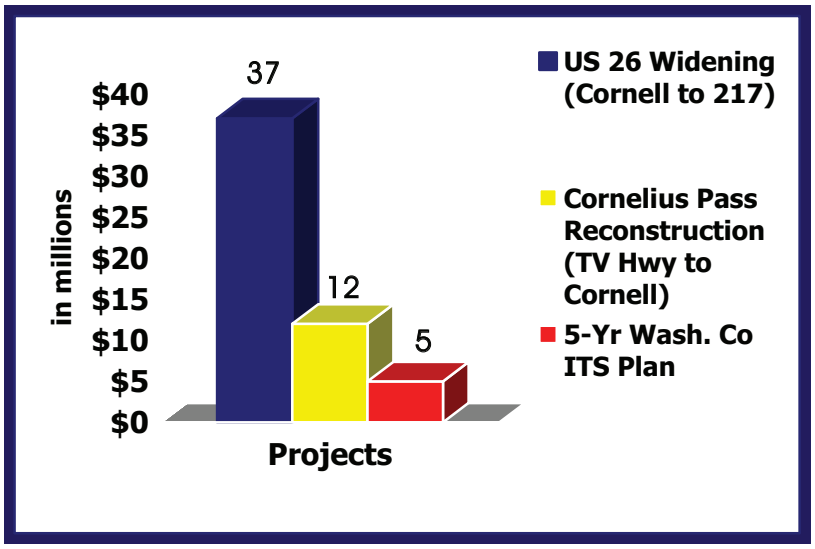
- 15-percent reduction in average incident duration
- 35-percent reduction in vehicle-hours incident delay



Traveler Information

Providing real-time traveler information gives people the ability to make informed travel choices. This could include changing a route, or selecting a different 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 Washington County for a fraction of the cost of large roadway construction projects such as the Sunset Highway widening project or Cornelius Pass improvement project.

Project Approach

Figure 1 (on the next page) illustrates the project approach used to develop the Washington County ITS plan. The outreach program has influenced every aspect of plan development and ensures the plan meets regional needs regardless of jurisdiction. A Steering Committee composed of key stakeholders from regional transportation agencies and emergency response agencies, guided the project. The key stakeholders included representatives of the following agencies:

- Washington County
- The City of Beaverton
- The City of Forest Grove
- The City of Hillsboro
- The City of Portland
- The City of Sherwood
- The City of Tigard
- The City of Tualatin
- Federal Highway Administration
- TriMet
- Tualatin Valley Fire & Rescue
- Oregon Dept. of Transportation
- Washington County Consolidated Communication Agency (911)

Additional input came from an expanded group of stakeholders, such as special interest groups, business representatives, the chambers of commerce and others. Outreach activities included:

- Monthly steering committee meetings.
- Interviews with stakeholders to collect information about existing conditions and transportation user needs.
- Deployment Plan Workshop, including the expanded group of stakeholders

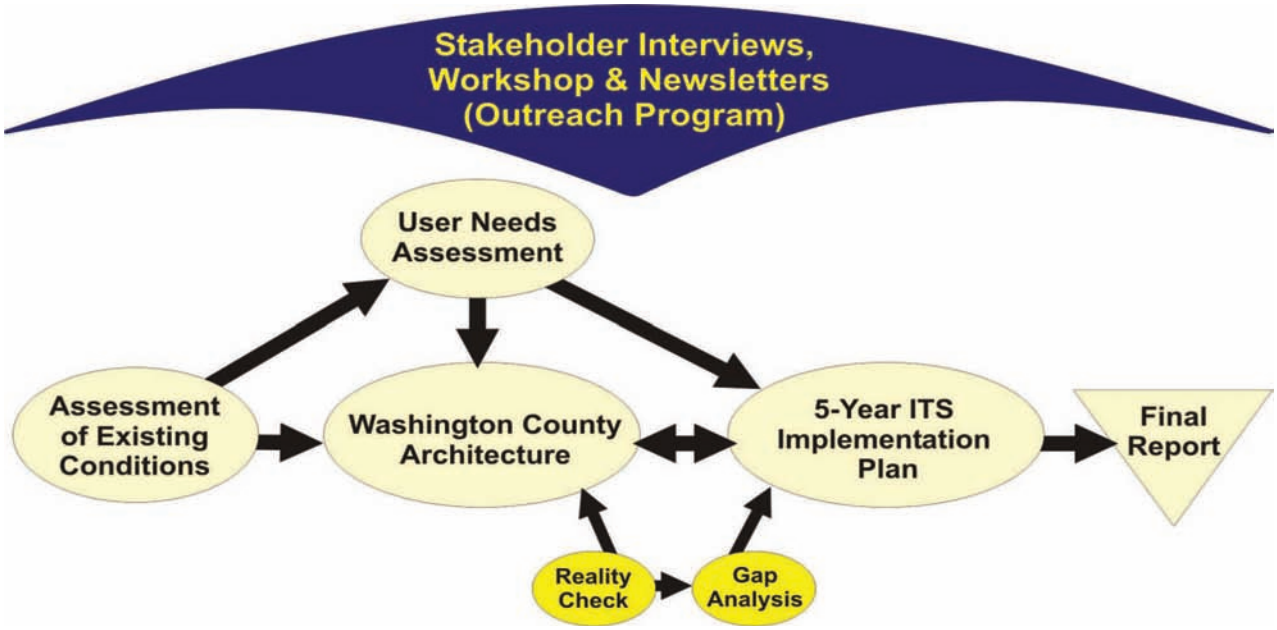


Figure 1: Project Approach

MISSION, GOALS & OBJECTIVES

To guide the development and ultimate deployment of intelligent transportation systems in Washington County, key project stakeholders developed a mission statement and accompanying goals and objectives.

Washington County ITS Mission Statement

Washington County, the cities within the county, and ODOT seek to improve the safety, security and movement of goods, people and services for all modes of the transportation network by using advanced technologies, coordinated management techniques, and by providing real-time traveler information.

Washington County Goals and Objectives

1) Improve the safety and security of our transportation system.

Objectives

- Reduce frequency, duration, and effects of incidents.
- Reduce emergency response times.
- Reduce recurrent congestion.
- Coordinate incident/security response with other local and regional agencies.
- Provide advanced incident information so responders arrive better prepared.

2) Improve the efficiency of the transportation system.

Objectives

- Reduce travel time for vehicles, including transit vehicles.
- Improve efficiency for all modes.
- Reduce travel time variability.
- Reduce fuel consumption and environmental impacts.
- Increase vehicle occupancy.
- Improve transit service reliability.
- Improve maintenance and operations efficiencies.
- Allow for real-time remote changes to signal timings.

3) Provide improved traveler information.

Objectives

- Provide real-time multi-modal transportation system information to travelers.
- Provide information about construction activities.
- Provide incident information.
- Provide real-time road condition and weather information.
- Provide one location where customers can access all regional and local traveler information.

4) Deploy functional and cost efficient ITS infrastructure.

Objectives

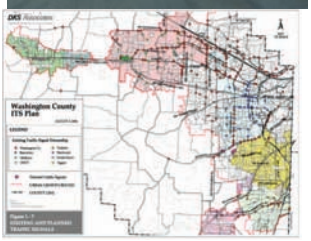
- Deploy systems that fit in with future improvements.
- Deploy systems with a high benefit-to-cost ratio.
- Deploy systems that maximize the use of existing infrastructure.
- Integrate deployments with other local and regional projects.
- Integrate systems that are consistent with existing systems policy.

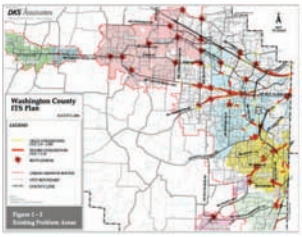
5) Integrate regional ITS projects with local and regional partners.

Objectives

- Build consensus among the Steering Committee members.
- Share resources between local and regional agencies.
- Continue to coordinate and integrate projects with other agencies.
- Promote public and private partnerships for ITS deployment, operations and maintenance.

CURRENT AND FUTURE TRANSPORTATION CONDITIONS





The current and future transportation conditions analysis describes the County's ITS infrastructure as well as planned ITS elements included in other local planning efforts.

ITS related equipment that can be utilized within Washington County includes:

- Traffic signals at 435 intersections.
- TriMet fiber optic cable from downtown Portland to Hillsboro
- ODOT fiber on Highway 217
- Planned fiber on Sunset Highway (US 26)
- Copper traffic signal interconnect
- City of Portland Central Signal System
- Closed Circuit Television (CCTV) cameras on Highway 217 and Sunset Highway (US 26)
- Ramp meters at Highway 217 and Sunset Highway (US 26) interchanges
- Dynamic message signs
- Automated Traffic Recorders (ATR)
- Washington County Consolidated Communication Agency (WCCCA) 911 Dispatch Center
- Emergency preemption at nearly all traffic signals

USER NEEDS ASSESSMENT

The mission, goals and objectives developed provide a high-level view of the ITS direction for the county. However, a more detailed view is needed to determine the specific elements for deployment in the future. Interviews with key stakeholders covered local-agency-specific needs. Mailed questionnaires to an expanded group of stakeholders focused primarily on gathering the big-picture user needs. After completion of the interviews, a meeting was held with key stakeholders to discuss and verify the transportation needs and identify additional needs. Table 1 summarizes the Washington County ITS needs categorized into four functional areas.

Table 1: Washington County ITS Needs

Travel & Traffic Management

Traffic Operations & Management

- Need to establish a communications link to the ODOT Traffic Management Operations Center (TMOC) and ODOT field devices to share video and data.

Need to integrate systems between local agencies.
Need to coordinate traffic signals with congested freeway off-ramps.
Need to improve traffic signal operations.
Need to improve traffic signal coordination across jurisdictional boundaries.
Need a high-speed remote connection to traffic signals.
Need automatic notification of traffic signal faults
Need traffic signals to respond in real-time based on traffic volumes.
Need to address congestion on key corridors.
Need improved bicycle detection
Need remote monitoring capabilities of major roadways and intersections.
Need to collect traffic volume data on arterial roadways.
Need advanced warning systems that enhance safety.
Need real-time weather information at locations prone to bad weather.
Need to coordinate regional incident response.
Need to document transportation system performance measures.
Need to improve transportation safety.
Need to reduce recurrent congestion.
Need to monitor railroad crossings.
Need transit signal priority on major arterials.
Need better traffic signal recovery methods for emergency response and railroad pre-emption.

Special Events

- Need to enhance traffic signal operations during holidays on 185th Avenue and near Washington Square.
- Need to provide real-time road closure information for annual festivals in various cities.

Traveler Information

Need to expand the congestion flow map to arterial streets.
Need to get congestion information to travelers prior to congested areas.
Need to post congestion information along major roadways.
Need to keep "real-time" information current (i.e. DMS signs, 511, highway advisory radio).

- Need to use multiple mediums to disseminate the information (i.e. radio, TV, 511, Internet, roadway signs).

Information Management

Need more automated data collection.
Need better systems in the field for real-time traffic data acquisition.
Need an information system that houses high-quality, consistent traffic count data.
Need to make more information available on the Internet.
Need a system to easily sort the data.

Table 1 (cont.): Washington County ITS Needs

Maintenance & Construction Management

- Need to automate the construction project website and include other Cities and utilities projects.
- Need to improve safety in construction work zones.
- Need road weather information (road temperature, wind, humidity) at key locations such as Barnes Road.
- Need weather forecast information.
- Need video images of key locations such as Barnes Road to monitor weather conditions.

Emergency Management

Communications

- Need a communications connection to ODOT Traffic Management Operations Center at the 911 dispatch center.
- Need a communications connection to regional hospitals (St. Vincent's or OHSU) for monitoring of major incidents that would impact them.
- Need communication connection to all emergency operations centers.

Emergency Management Operations

- Need to estimate incident duration quickly.
- Need video images at 911 centers and dispatch centers to aid with dispatch (injury incident or not).
- Emergency services need railroad crossing information.
- Need to integrate transportation information with mobile data terminals housed in emergency response vehicles.
- Need to integrate real-time transportation information with emergency computer aided dispatch to select fasted route.
- For corridors with multiple traffic signals, need pre-emption at downstream intersections to clear downstream bottleneck.
- Need to place cameras along response routes with medians.
- Need real time construction information so emergency vehicles can alter routes.

ITS ARCHITECTURE

The Washington County ITS Architecture identifies desired services and also describes the necessary interconnections and information flows required to ensure system compatibility and interoperability. Figure 2 illustrates the physical architecture for Washington County, e.g., the key stakeholders, ITS elements, and interconnections between them. ITS technologies must be compatible with adjacent jurisdictions to maximize their use. For example, to coordinate traffic signals across jurisdictional boundaries, the signals must be able to speak the same languages and agree on the time-of-day. The Washington County ITS Architecture ensures this happens by identifying the connection to the adjacent agency and the information required to provide the desired service.

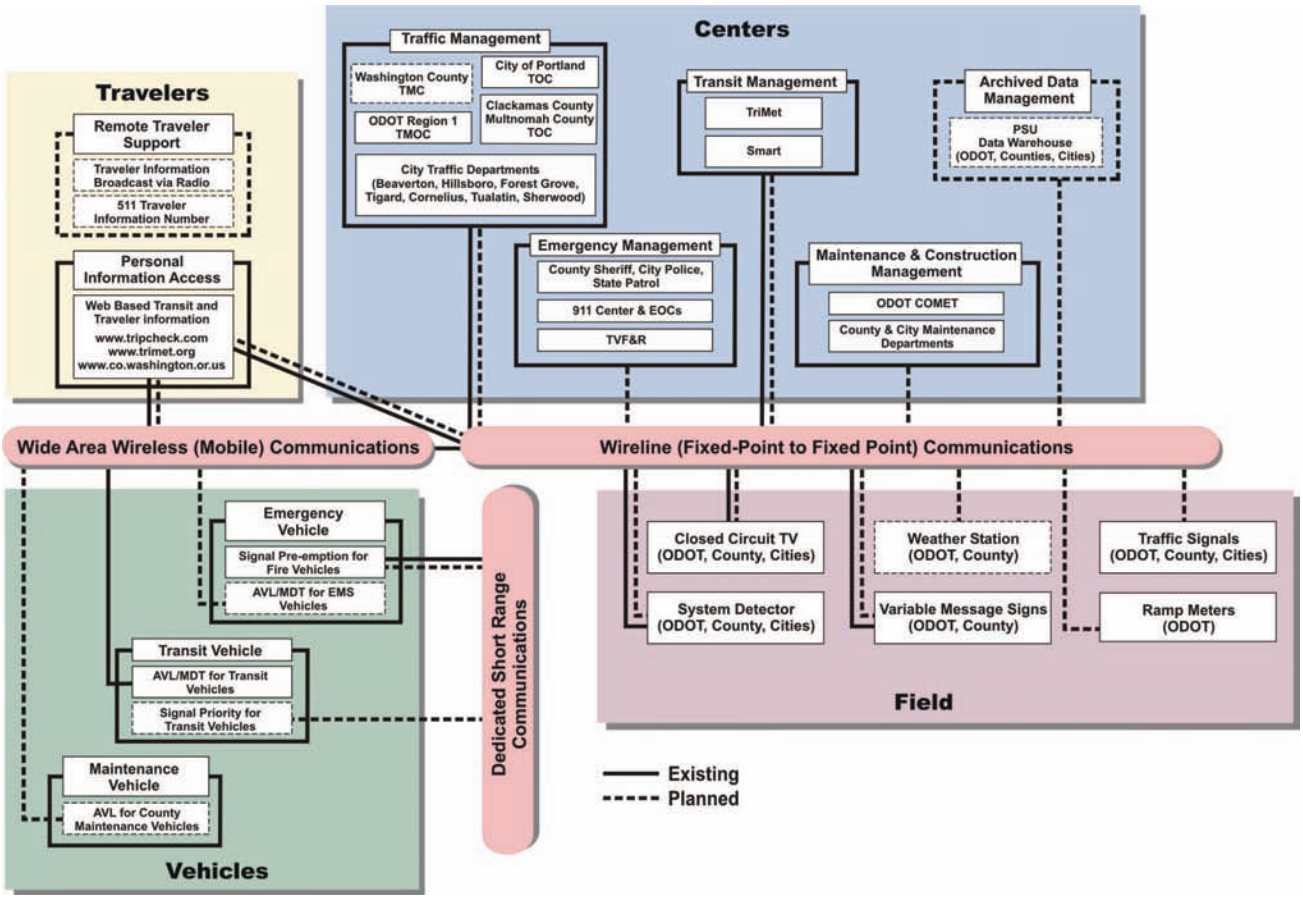


Figure 2: Washington County Physical Architecture

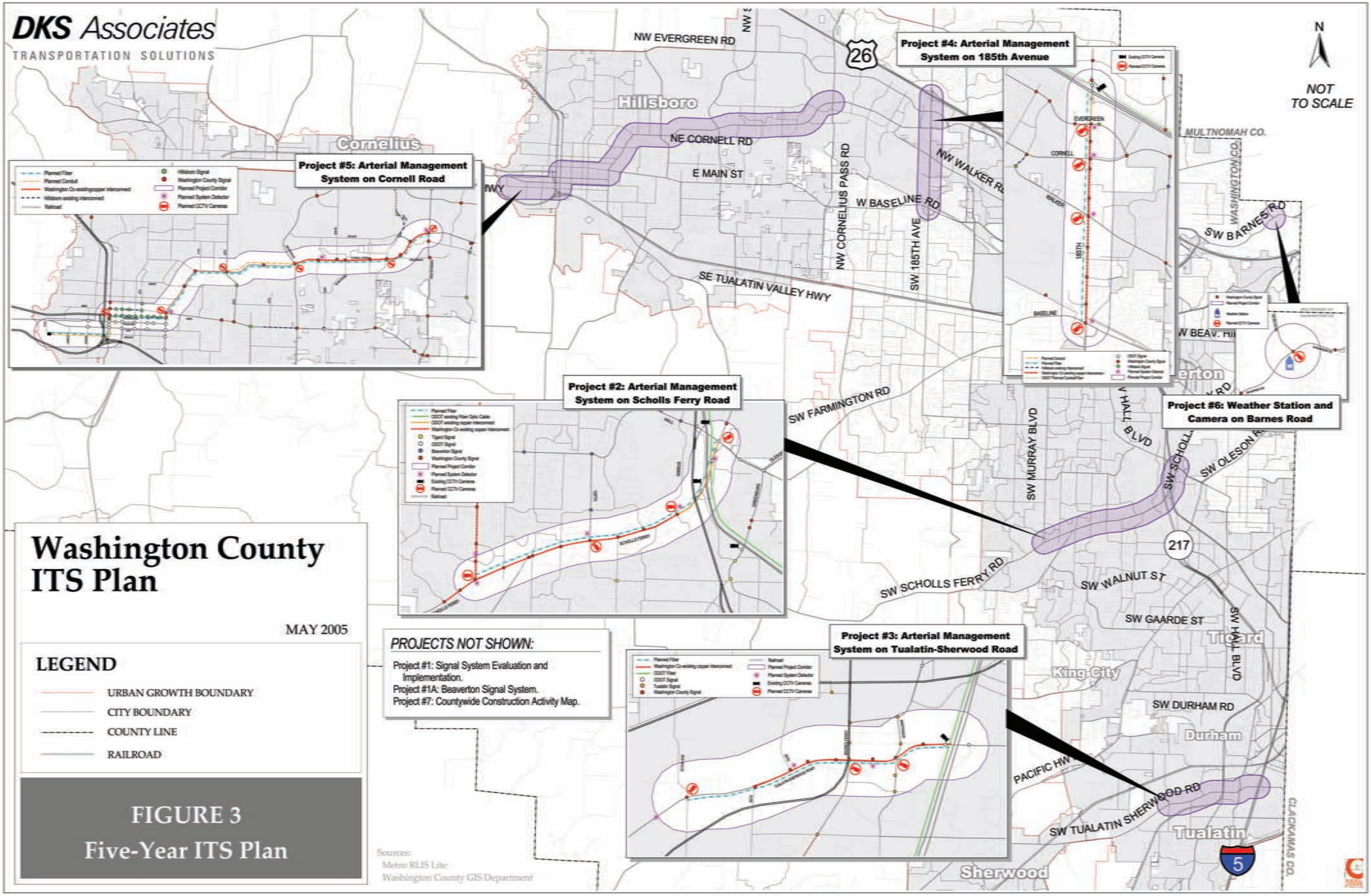
The Washington County ITS Architecture is based on the National ITS Architecture and is consistent with the TransPort Regional ITS Architecture developed in 2001 by the regional agencies. Based on the results of the Washington County ITS planning process, the TransPort Regional Architecture was updated to reflect additional stakeholders, user services and market packages identified for Washington County.

FIVE-YEAR DEPLOYMENT PLAN

The Washington County five-year deployment plan was intended to provide a framework for ITS in Washington County as well as providing a short-term list of ITS related projects. Based on stakeholder input and key findings from system evaluations, the five-year projects recommended for implementation in Washington County have been organized and described within the following program areas:

- Travel and Traffic Management
- Traveler Information
- Maintenance and Construction

Figure 3 depicts field device locations for the five-year ITS Plan. A detailed description of the five-year plan project follows the figure. The project numbers are for reference purposes only and do not indicate project priority.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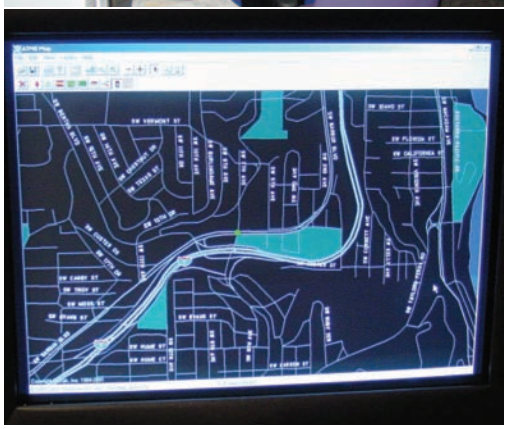
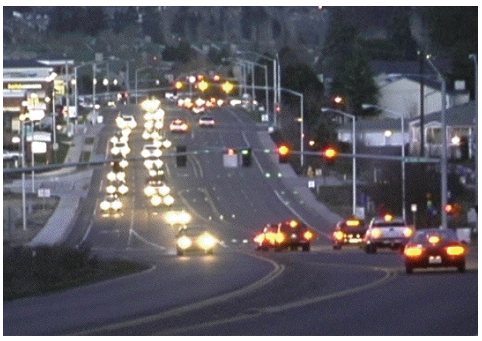
TRANSPORTATION SOLUTIONS
N
NOT TO SCALE
Project #4: Arterial Management System on 185th Avenue
Project #5: Arterial Management System on Cornell Road
Project #2: Arterial Management System on Scholls Ferry Road
Project #6: Weather Station and Camera on Barnes Road
Project #3: Arterial Management System on Tualatin-Sherwood Road
NW EVERGREEN RD
Hillsboro
NE CORNELL RD
E MAIN ST
Cornelius
NW CORNELIUS PASS RD
W BASELINE RD
SW 185TH AVE
NW WALKER RD
SE TUALATIN VALLEY HWY
MULTNOMAH CO.
WASHINGTON CO.
SW BARNES RD
SW FARMINGTON RD
SW MURRAY BLVD
SW HALL BLVD
SW OLESON RD
SW SCHOLLS FERRY RD
SW WALNUT ST
SW GAARDE ST
Tigard
King City
SW DURHAM RD
Durham
PACIFIC HWY
SW TUALATIN SHERWOOD RD
Tualatin
Sherwood
CLACKAMAS CO.
26
217
5
Washington County ITS Plan
MAY 2005
LEGEND
URBAN GROWTH BOUNDARY
CITY BOUNDARY
COUNTY LINE
RAILROAD
PROJECTS NOT SHOWN:
Project #1: Signal System Evaluation and Implementation.
Project #1A: Beaverton Signal System.
Project #7: Countywide Construction Activity Map.
FIGURE 3
Five-Year ITS Plan
Sources:
Metro RLIS Lite
Washington County GIS Department

Project 1: Central Signal System- This project includes installation of central signal system software that allows remote management of traffic signals and is integrated with other agencies throughout the region. It includes the development of a Transportation Operations Center (TOC) at Washington County for the monitoring and control of regional traffic operations. The vision for the TOC is initially one or two workstations with real-time access to field devices. This project will include a communications connection from Washington County to the City of Portland traffic signal system server. This will provide traffic engineers and technicians the ability to monitor and change signal timing remotely. This project supports arterial management projects and advanced signal timing projects and will include video for monitoring and count stations for traffic data collection. Washington County has secured funding for this initial project.



Project 1A: City of Beaverton Central Signal System- This project includes installation of central signal system software at the City of Beaverton that allows remote management of traffic signals and is integrated with Washington County and other jurisdictions in the region. It would configure a "Virtual" Transportation Operations Center (TOC) at the City of Beaverton for monitoring and control of City maintained traffic operations. This project will include a communications connection from the City of Beaverton to City of Portland traffic signal system server.

Arterial Management Systems- These projects include deployment of arterial surveillance and management devices that provide traffic-responsive corridor management, traveler information, and improved freight mobility. It also supports incident management. These projects include traffic detection and closed-circuit television (CCTV) systems to provide supporting traffic congestion and incident detection information. Arterial management systems will provide the capability for traffic signal engineers to remotely access and adjust signal timings to more effectively and quickly adjust traffic signal timings during incidents and the peak holiday shopping season as well as making signal timing changes in response to traveler comments. The advanced traffic signal control and traffic signal upgrades deployed with these projects will also support transit signal priority to improve transit travel times. Camera placement, particularly at key high collision intersections, will provide agency staff with the ability to monitor the roadway for congestion, trouble spots, incidents, equipment failures, and traffic signal operations. This information helps improve the efficiency of traffic management, incident management, and operations and maintenance management, which effectively helps improve roadway safety and efficiency. Arterial management systems are planned on the following corridors:

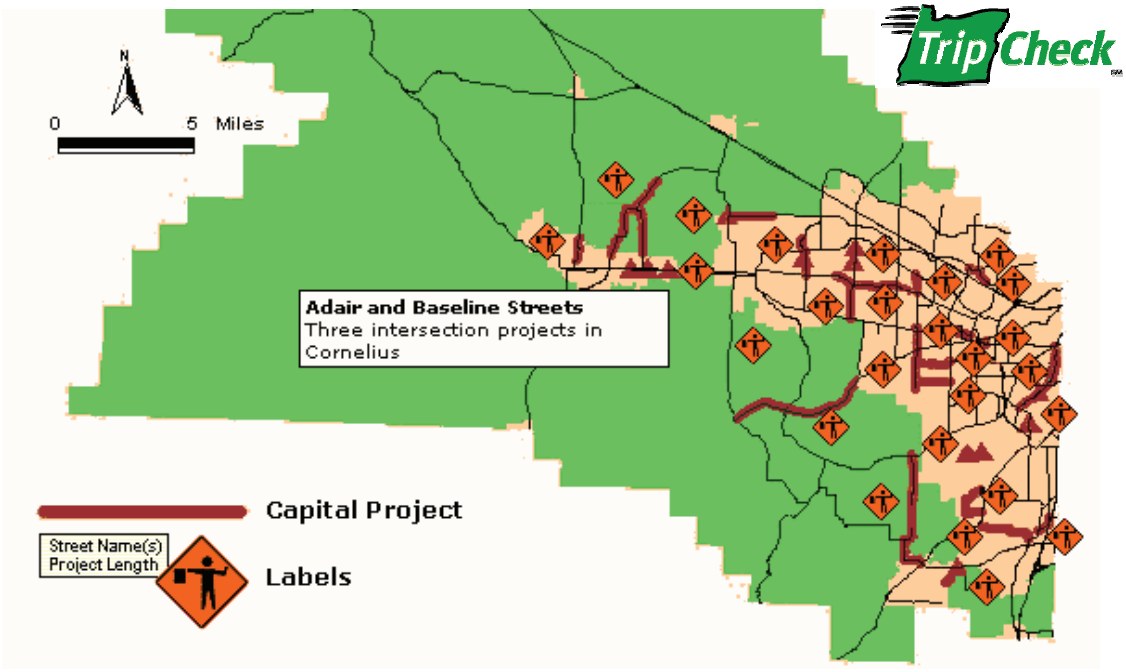


Project 2: Scholls Ferry Road from Hall Boulevard to Murray Boulevard;
Project 3: Tualatin-Sherwood Road from I-5 to Teton Avenue;
Project 4: 185th Avenue from Baseline Road to US 26; and,
Project 5: Cornell Road from downtown Hillsboro to Cornelius Pass Road

Project 6: Weather Station and Camera on Barnes Road- This project will include installation of a roadway weather information system (RWIS) on Barnes Road adjacent to St. Vincent's Hospital. The system will collect atmospheric weather data and local pavement condition information. The project will include the installation of a camera to monitor conditions and to determine when to dispatch weather related maintenance vehicles. Based on the information from the weather station and the camera, maintenance and operations personnel can determine the amount of resources needed for road weather maintenance. The information from the weather station will also be linked to the ODOT traveler information web page.

Automated Road and Weather Station Glen Jackson Bridge- North	
Temp: 68.3F	Dew Point: 66F
Precipitation:	
Relative Humidity: 93%	
Visibility:	
Wind Speed(Avg): 2 mph	
Wind Speed(Gusts): 4 mph	
Wind Direction: E	
Last Updated: 8/10/2004 7:02 am	

Project 7: County Wide Construction Activity Map- This project will include development of a user-friendly website that provides up-to-date static and real-time construction information. The site information can: aid travelers with pre-trip planning and provide transportation system managers with a complete picture of transportation conditions to implement alternate routes. The site provides a location for designers and planners to identify and coordinate construction projects. This website will be helpful for business freight managers to adjust routes to best maintain freight mobility. This website map will include construction projects for Washington County, cities and agencies within Washington County and utility companies. This project will consider integrating Washington County related construction information with the existing ODOT Highway Traffic Condition Reporting System (HTCRS). The ODOT system provides construction related information via the statewide TripCheck traveler information website (www.tripcheck.com). Integrating Washington County related construction projects with the existing ODOT traveler information website benefits the public by providing one website to access all conditions affecting transportation in the region and state.



Five-Year Plan Project Schedule

Table 2 includes an implementation schedule, which is based on project rankings. Stakeholder input helped determine project rankings using the following criteria:

- Safety/crash prevention
- Traffic volumes
- User needs
- Relativity to other planned projects
- Short term funding availability
- Input from the steering committee
- Cost
- Expected benefits
- Technical and institutional feasibility
- Equitable distribution of projects

Table 2: Washington County Five-Year Deployment Plan Schedule

Project. #	Project Title Years	5-Year Plan 1 (2005)	2 (2006)	3 (2007)	4 (2008)	5 (2009)
1	Signal System Evaluation and Implementation	■				
1A	Beaverton Signal System		■			
2	Arterial Management System on Scholls Ferry Road			■	■	
3	Arterial Management System on Tualatin-Sherwood Road				■	■
4	Arterial Management System on 185th Avenue				■	■
5	Arterial Management System on Cornell Road	■	■			
6	Weather Station and Camera on Barnes Road					■
7	County Wide Construction Activity Map			■		

■ Proposed Implementation

Deployment Plan Costs

Table 3 summarizes the estimated capital costs and annual operations/maintenance costs for implementation of the five-year plan. It includes a capital cost of approximately $4.9 million along with a $175 thousand annual operations and maintenance cost. To maximize the benefits of ITS projects in Washington County, an on-going commitment must be made to the operations and maintenance of equipment and software and to consistent staffing.

Table 3: Estimated Capital, Operations, & Maintenance Costs for Five-Year Plan

Implementation Stage	Estimated Implementation Capital Costs	Estimated Annual Operations & Maintenance Costs*
Five-Year Plan	$4,900,000	$175,000

* Annual operations and maintenance costs are per year.

Future Washington County ITS Project Framework

Due to funding, the intent of this deployment plan is to determine a short-term, five-year ITS project list for Washington County. The purpose of this section is to outline other planned ITS projects that have been identified by other agencies within Washington County. This section also provides future sketch level ITS projects that are either an extension of projects already identified in the five-year plan or are other reasonable projects that would either build off of existing infrastructure or would link key corridors with communications. Figure 4 summarizes the ITS framework that should be considered in ITS planning beyond the 5-year plan. These additional corridors and projects extensions include:

New Corridors:

- **Cornelius Pass Road** from TV Highway to West Union Road.
- **Walker Road** from Cornell Road to Highway 217
- **Beaverton-Hillsdale Highway** from Highway 217 to Washington County line.
- **Greenburg Road** from Hall Boulevard to Pacific Highway (99W).
- **Hall Boulevard** from Highway 217 ramp to Greenburg Road.
- **Murray Boulevard** from Scholls Ferry Road to Farmington Road.
- **Pacific Highway (99W)** from Tualatin-Sherwood Road to Highway 217.
- **Farmington Road** from 185th Avenue to Highway 217.
- **TV Highway** from downtown Hillsboro to US 26 (ODOT).
- **Sunset Highway (US 26)** from Shute Road to Highway 217 (ODOT).

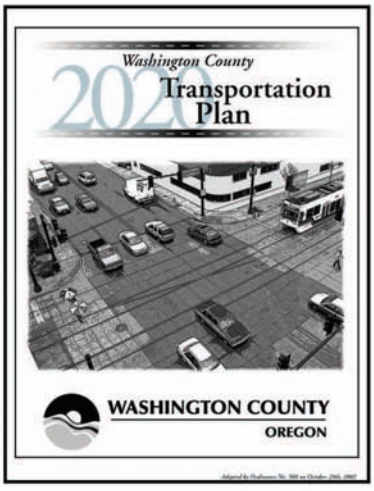
Project Extensions:

- **Tualatin-Sherwood Road** (Project 3)- from Teton Avenue to Pacific Highway (99W).
- **SW 185th Avenue** (Project 4)- from Farmington Road to NW Springville Road.
- **Cornell Road** (Project 5)- from Cornelius Pass Road to the Washington County Line (east).

NEXT STEPS

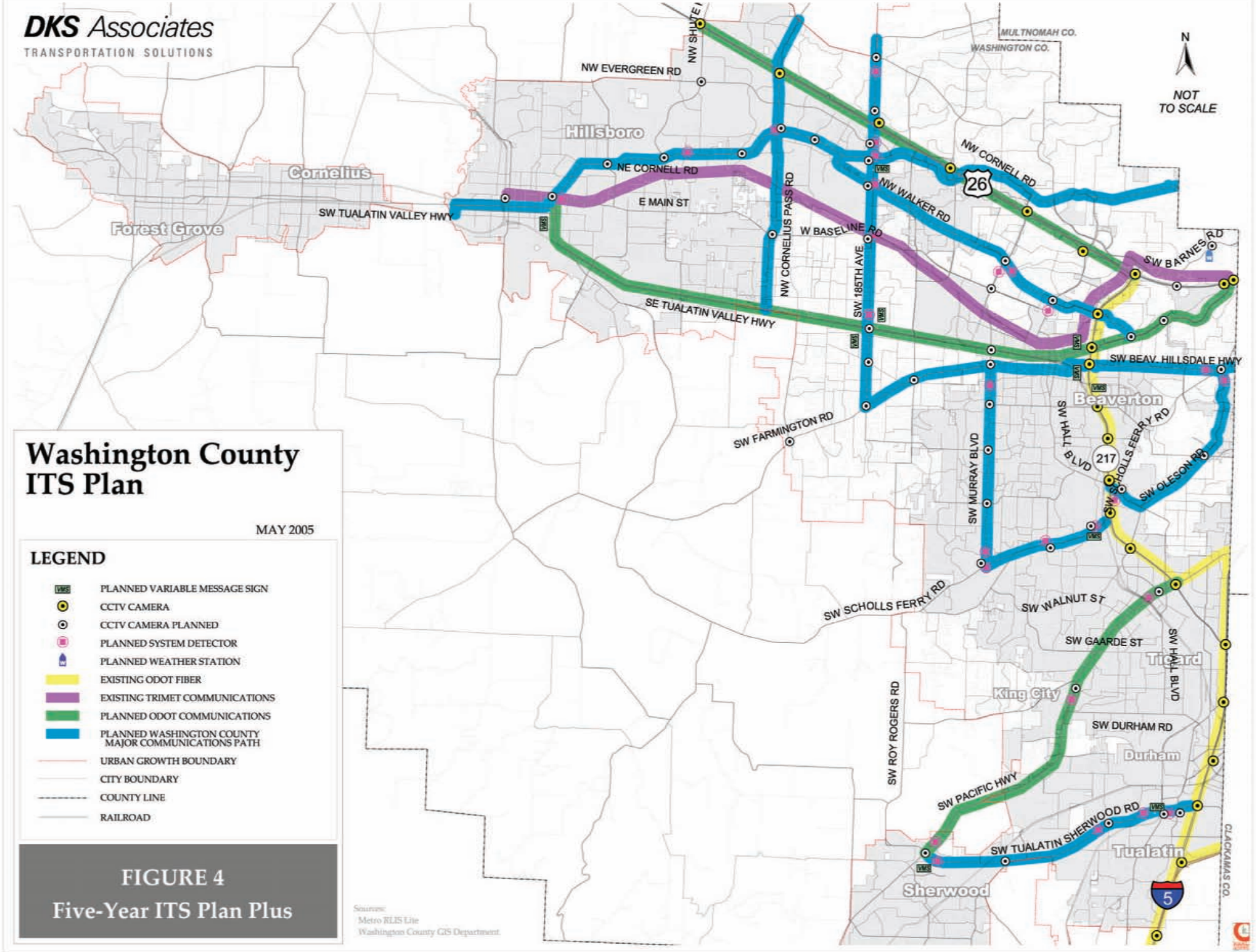
ITS Long Term Planning

As mentioned previously, the intent of the current deployment plan is to determine a short-term, five-year ITS project list for Washington County. A future plan that would extend beyond five-years is the likely next step for Washington County to determine mid-term (10-year) and long-term (20-year) ITS projects. Completing these plans will assure that future ITS needs (i.e. conduit for communications) are installed with current and near-term construction projects in the most cost effective manner.



Incorporate the ITS Plan into TSP/SDC

The ITS devices and communication infrastructure identified in this plan should be installed on corridors concurrently with traditional transportation construction and maintenance projects when feasible. This approach will minimize reconstruction, maximize the use of resources, and result in the modernization of the regional transportation system. 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. The ITS deployment plan and communication maps, as well as the five-year plan project list, should be adopted in the Washington County TSP and other local TSP's. If adopted, ITS projects can become components of local capital improvement plans and possibly SDC's. In addition, the adopted plan maps can be used to require the installation of conduit with public or private roadway projects to support future ITS implementation.


DKS Associates
TRANSPORTATION SOLUTIONS
Washington County ITS Plan
MAY 2005
LEGEND
PLANNED VARIABLE MESSAGE SIGN
CCTV CAMERA
CCTV CAMERA PLANNED
PLANNED SYSTEM DETECTOR
PLANNED WEATHER STATION
EXISTING ODOT FIBER
EXISTING TRIMET COMMUNICATIONS
PLANNED ODOT COMMUNICATIONS
PLANNED WASHINGTON COUNTY MAJOR COMMUNICATIONS PATH
URBAN GROWTH BOUNDARY
CITY BOUNDARY
COUNTY LINE
RAILROAD
FIGURE 4
Five-Year ITS Plan Plus
Sources:
Metro RLIS Lite
Washington County GIS Department
MULTNOMAH CO.
WASHINGTON CO.
CLACKAMAS CO.
N
NOT TO SCALE
Hillsboro
Cornelius
Forest Grove
Beaverton
Tigard
King City
Durham
Tualatin
Sherwood
NW EVERGREEN RD
NW SHUTE
NE CORNELL RD
E MAIN ST
SW TUALATIN VALLEY HWY
NW CORNELIUS PASS RD
NW CORNELL RD
NW WALKER RD
W BASELINE RD
SW 185TH AVE
SE TUALATIN VALLEY HWY
SW BARNES RD
SW BEAV. HILLSDALE HWY
SW FARMINGTON RD
SW MURRAY BLVD
SW HALL BLVD
SW SCHOLLS FERRY RD
SW OLESON RD
SW WALNUT ST
SW GAARDE ST
SW ROY ROGERS RD
SW DURHAM RD
SW PACIFIC HWY
SW TUALATIN SHERWOOD RD
26
217
5

Project Evaluation Criteria

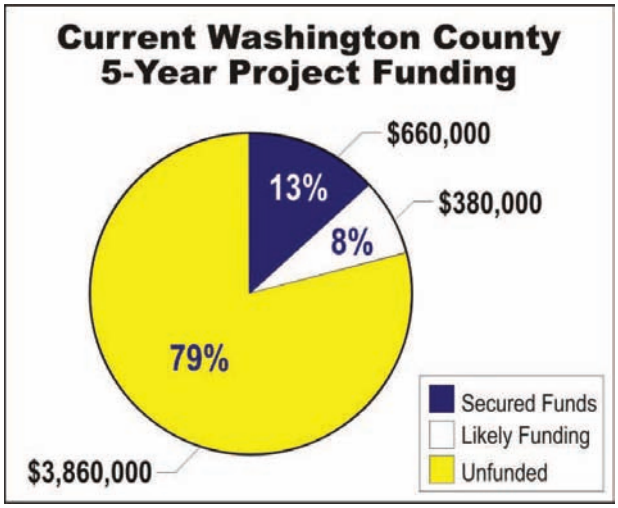
Integrating ITS projects into transportation system and capital improvement plans is a relatively new concept. Existing project ranking criteria for these plans should be evaluated and revised to better accommodate ITS projects. Additional criteria to consider should include:

- Supports incident management on congested corridors
- Fills in gaps in existing corridor management efforts
- Enhances information exchange between regional transportation agencies
- Applies improvements to facilities undergoing reconstruction
- Mitigates congestion on key corridors

Funding

Fully funding the design and construction costs for the five-year ITS project list identified in this deployment plan requires $4.9 million dollars with an additional $175,000 of estimated annual operations and maintenance costs. Currently, Washington County has secured $660,000 in federal funding with another $380,000 likely to be funded with the 2006 Metropolitan Transportation Improvement Program (MTIP). Other potential funding sources for funding ITS projects in Washington County include:

- Washington County Major Streets Transportation Improvement Program 3 (MSTIP3)
- Traffic Impact Fees (TIF)
- Funding support from the Washington County Information Services department
- Funding support from the Washington County Operations department
- Joint funding for regional improvements involving other public agencies



Continuing ITS Working Group

The Washington County ITS Steering Committee should continue to meet as necessary to oversee ITS planning and construction. The continuing roles of the Steering Committee include the following:

- Make decisions regarding project phasing. As opportunities arise (funding source, priority shift, or concurrent construction), adjust the project phasing as appropriate
- Help with or coordinate funding applications
- Help with or coordinate project implementation
- Develop memoranda of understanding (MOUs) or intergovernmental agreements (IGAs) as required
- Prepare plans and standards (incident management plans and standards for communication design, work zones, and data management)
- Have representatives participate in the TransPort Regional ITS committee