

User Needs, User Services and User Requirements

Technical Memorandum #1

FINAL

Prepared for:

Thurston Regional Planning Council

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Executive Summary

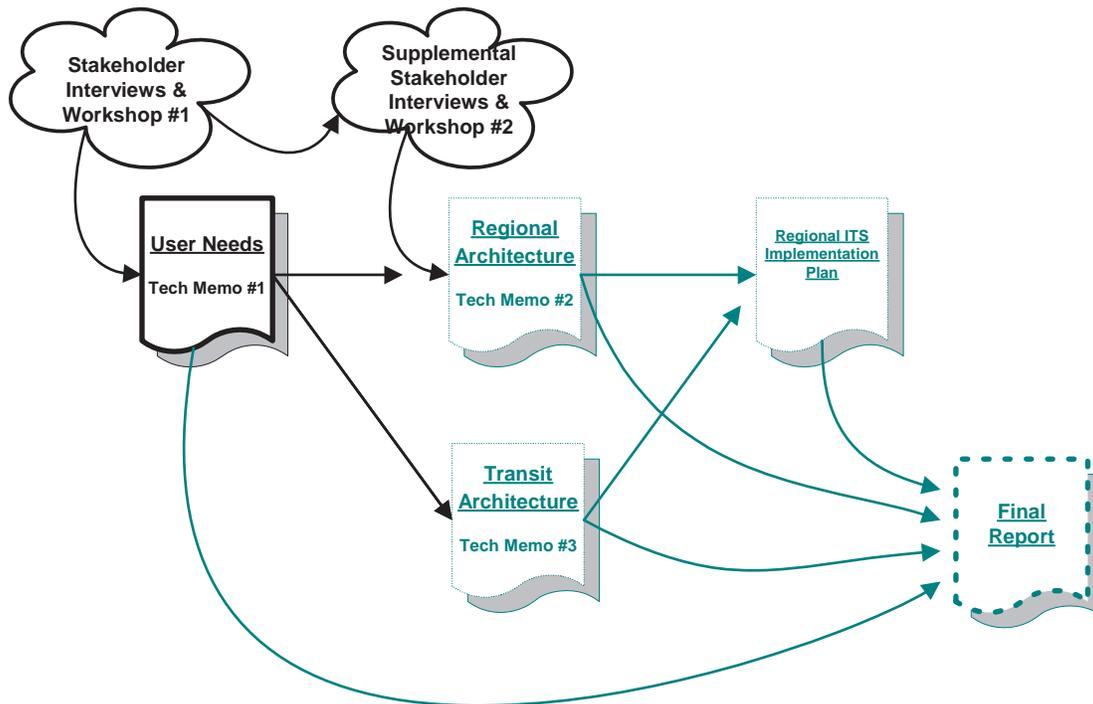
This document is the first in a series of five that present the sequential results of the Thurston Regional Planning Council (TRPC) – Regional Intelligent Transportation Systems (ITS) Planning Project.

This document content includes the regional stakeholder interview notes, results from initial stakeholder interviews and Workshop #1, and initial mapping of user needs to user services and user requirements. Additional detailed content will be presented in subsequent documents to include:

- Tech Memo #2 – Regional Architecture
- Tech Memo #3 – Transit Architecture
- Regional ITS Implementation Plan, and
- Final Report.

Additionally, these same products will be made available through the TRPC web site.

The relationship of this document to the others, and the uses of these documents is as illustrated in the following figure.



This document contains the initial results of interviews and workshop discussions with the several key regional stakeholders. These stakeholders are identified both in Section 2 and in Appendix A.

The process of interviews and workshop discussion is explained in Section 2 and served to develop a list of regional user needs, as stated in the operational, functional or needed benefits terminology used by the stakeholders.

The resulting expression of user needs is presented in Section 3 and is organized in six operational or interest domains:

- traffic,
- transit,
- freight mobility,
- incident/emergency response and management,
- traveler information, and
- information storage and management.

It is suggested that readers with a specific interest in one or more of these domains can read that section exclusive of the others to gain a quick awareness of the statement of needs.

In Section 4, the user needs are mapped or translated to user services. These user services are the first step in migration and tailoring of the regional needs to the “language” of the National ITS Architecture encouraged by the U.S. DOT. Since it is inappropriate to impose “architecture-speak”, this transition is softened somewhat through moderate tailoring of the user services to match the statements and tone of the stated user needs.

In Section 5 the process of mapping regional needs to the national architecture continues. In this case, the general user services “bundles” are expanded into more definitive statements of user requirements. These statements form an initial general baseline for visualizing the regional ITS requirements in terms of the “shall, will and should” statement of individual requirements. This step furthers the process of establishing the connection between stated regional needs and the inner workings of the National ITS Architecture as these user requirements trace most directly to the logical architecture, then the physical architecture—enabling us to now begin to “visualize” the Thurston Regional ITS in subsequent project documents.

Section 6 contains the initial inventory of existing ITS and immediately available ideas for near-term future ITS in the Thurston region. The completeness of this section will be resolved through focused follow-up interviews, Workshop #2, and additional details provided by the regional stakeholders as their review of project materials proceeds. This inventory of ITS baseline and the new ideas will be finalized and visualized (as the “Now” and the “Then”) in both the regional architecture and the transit architecture reports (e.g., Tech Memos #2 and #3 respectively).

Section 7 contains initial information on institutional relationships and data sharing. This initial, higher-level information will be refined and restated in more detail in the subsequent documents.

Section 8 provides a glossary of terms, acronyms, and definitions of architectural terms.

Appendix A contains the Start-up materials and interview notes.

Appendix B contains the materials used in Workshop #1, the follow-up teleconference, and in Workshop #2.

Appendix C contains preliminary refinement and traceability analysis based on extracts from the initial interviews and workshop results. This information subsequently proved too detailed for use in the main body of this document. It is included here as working papers for reference purposes.

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1 Introduction

1.1 PURPOSE

The purpose of this Technical Memo is to describe and document the first steps undertaken in the development of the Regional Intelligent Transportation Systems (ITS) Architecture for the Thurston region. These initial steps and work products will form the foundation for future planning efforts for developing a regional ITS architecture.

The report reviews the process used for identification, collection and enumeration of user's needs for the Thurston Region. In addition, this report summarizes the analysis and synthesis of stakeholder feedback including interview and workshop results to enable the transition of the expressed user needs into User Services and User Requirements in a format consistent with the National ITS Architecture development process.

The report also includes an initial inventory of operational legacy ITS and planned regional ITS projects that are relevant to the architecture development process. Lastly, the report identifies baseline data needs, process specifications and institutional cooperation that is needed to support the intended regional ITS architecture.

1.2 SUMMARY OF SECTIONS

Section 2 – Identification of stakeholders, users, and the interview and workshop process.

Section 3 – Baseline statement of collected user needs organized by domain of applicability: traffic, transit, freight mobility, incident/emergency response and management, traveler information, and information storage and management.

Section 4 – A mapping of user needs to user services; a first step in introduction of the National ITS Architecture.

Section 5 – Further mapping of user services to tailored statements of user requirements; a second step in the more detailed mapping of user needs to user services to user requirements in the National ITS Architecture.

Section 6 – Initial inventory of existing regional ITS, and ideas for future ITS.

Section 7 – Baseline statement of data sharing, institutional relationships, and process specifications.

Section 8 – Glossary of terms, acronyms and definitions.

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2 Identification of Stakeholders and Users

This section describes the process and steps undertaken for the collection and compilation of Thurston regional ITS architecture needs, stakeholder needs, and existing ITS inventory.

Major activities consisted of identification of key ITS stakeholders, in-depth interviews with a cross-section of those stakeholders, then planning and conducting a Regional ITS Workshop. Additional follow-up was also undertaken after the workshop to fill information gaps identified through these outreach efforts.

Using start-up information provided by the TRPC and through initial interviews with stakeholders, the regional team formulated a structure for information gathering consistent with the national architecture. This structure consists of six general areas of interest:

<u>Area of Interest</u>	<u>What is included (e.g., ...)</u>
<ul style="list-style-type: none"> • Traffic 	Traffic operations, control and maintenance on city, county and state roads; also includes primary data collection of traffic counts and images used for subsequent information extraction
<ul style="list-style-type: none"> • Transit 	Intercity Transit, fixed route and demand transit operations, connections with regional partners
<ul style="list-style-type: none"> • Freight Mobility 	Commercial vehicles, railroads, airport, trans-shipment of goods, access to port facilities, etc.
<ul style="list-style-type: none"> • Incident/Emergency Response & Management 	Traffic incidents, planned incidents, weather, police, fire, medical response, flood, earthquake, etc.
<ul style="list-style-type: none"> • Traveler Information 	Roadway system status in the region, traveler and commercial operator advisories, pre-trip and en-route information, weather, etc.
<ul style="list-style-type: none"> • Information Storage & Management 	What data should be collected, archived, shared, etc.

These categories were then used to organize the collected materials and structure the follow-on actions.

2.1 IN-DEPTH STAKEHOLDER INTERVIEWS

To collect a broad brush of regional information related to each of the six identified areas of interest categories, invite and stimulate regional stakeholder involvement and commitment to the process, and collect specific information for planning purposes, an extensive stakeholder interview process was undertaken.

The Thurston Regional Planning Council undertook the initial identification of regional ITS stakeholders for use by the project team. The team reviewed this list, made suggestions, and reached consensus on the initial stakeholders to be contacted with the goal to contact and interview a broad spectrum of ITS stakeholders. This original list is shown as Table A-1, Appendix A. Working from this annotated list, the consultant team made contact and interviewed as many of the stakeholders as possible. Summaries of interview discussions are contained in Appendix A. Interviews were conducted face-to-face unless noted.

Key questions or issues discussed with interviewees included:

1. Can you provide a brief summary of the current transportation services that your organization provides? What are the responsibilities of your section / department of your organization? What are your individual responsibilities?
2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?
3. How does your organization interact with other organizations in exercising its transportation responsibilities? What information/data do you provide to other organizations, and what systems or methods do you employ to provide it? What information/data do other organizations provide to you, and what systems or methods do they employ to provide it? What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements? What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?
4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? What opportunities exist that we should be aware of for the TRPC planning process? What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?

In addition to collecting information through the interview process, the team was provided with a summary of prior stakeholder feedback about ITS compiled by the TRPC—these start-up sources are also identified in the following list.

The initial interview contacts and start-up information sources are listed below and also annotated in Table A-1:

Table 2-1: Identification of Start-Up Sources and Initial Interviews Conducted

Organization/Functional Area	Name(s)	Date Interviewed
WSDOT Olympic Region – Freeway Operations	John Nisbitt, Jim Mitchell	2/13/2001
Thurston County Roads & Transportation Services	Dick Weston	3/29/2001 (by phone)
WSDOT ITS	Bill Legg, Ed McCormack	2/12/2001
Ft. Lewis, Emergency Operations Center – Operations Officer	Don Edwards	2/13/2001
Puget Sound & Pacific Railroad	Tom Foster	3/29/2001 (by phone)
City of Tumwater	Doug Johnston	3/20/2001 (by phone)
Port of Olympia	Nick Handy	3/20/2001 (by phone)
WSDOT Public Transportation Office, mobility Planning Administration	Gordon Kirkemo	2/7/2001 (by phone)
WSDOT ACCT	Don Chartock	2/8/2001 (by phone)
City of Yelm	Cathie Carlson	3/21/2001 (by phone)
Washington Trucking Association	Jim Tutton	4/9/2001 (by phone)
Intercity Transit – Planning & Maintenance	(unidentified respondents)	Self-Completed questionnaire
Grays Harbor Transportation Authority	Dave Rostedt	Self-Completed questionnaire
Sound Transit -- Research & Technology Management	Nick Roach	
Twin Transit	Patty Alvord	
Pierce Transit	Keith Messner	
King County Department of Transportation – Metro Transit Division, Management Information & Transit Technology Section	Dan Overgaard	
City of Olympia	Dave Riker, Subir Mukerjee	Start-Up Information
City of Lacey	Dennis Ritter, Martin Hoppe	Start-Up Information
City of Tumwater	Jay Eaton, Doug Johnston	Start-Up Information
City of Yelm	Shelly Badger, Cathie Carlson	Start-Up Information
Port of Olympia	Nick Handy, Andrea Fontenot	Start-Up Information
Thurston County Roads & Transportation Services	Lester Olson, Les Olsen	Start-Up Information
Thurston Geodata Center	Andrew Kinney	Start-Up Information
Intercity Transit	George Patton, Jim Merrill	Start-Up Information
Thurston County 911	Jim Quackenbush	Start-Up Information
Tacoma Traffic Management Center – WSDOT Olympic Region Operations	Jim Mitchell	Start-Up Information
Washington State Patrol	Dan Parson, John Bruun	Start-Up Information

2.2 REGIONAL STAKEHOLDERS WORKSHOP

Following the in-depth interview process, the project team organized and facilitated a half-day regional ITS workshop on April 18, 2001. ITS stakeholders from throughout the Thurston County region were recruited to participate with the goal of bringing as diverse a group of ITS stakeholders together as possible for more information gathering and needs identification. Approximately 40 people attended; a list of attendees is available in Appendix B.

The purpose of the workshop was two-fold: to inform the attendees about the regional architecture project and to seek input to help shape the planning process. Due to the technical nature of ITS, the approach to the workshop was to focus on several high-level areas that would elicit the most feedback from the participants. Key topics covered in the agenda included:

- Overview of ITS and ongoing initiatives throughout the state;
- Overview of an ITS architecture and key components;
- Process for developing a regional architecture;
- Discussion on key findings from stakeholder interviews and additional identification of needs; and
- A facilitated discussion using an earthquake scenario to elicit feedback and information sharing protocols.

In addition, the participants were also encouraged to share their ideas and comments, or any other ITS related feedback they wanted to provide the TRPC. As a result, some of their comments pertained to project specific needs or issues while others revolved around policy issues or recommendations beyond the scope of the regional architecture. Efforts were made to focus the discussion on issues affecting the regional architecture, while still allowing the participants latitude to discuss ITS issues important to them.

Feedback provided by stakeholders at the workshop has been compiled and analyzed for use in identification of user needs and ITS inventories.

2.3 INFORMATION SHARING SCENARIO

The workshop agenda included facilitated group discussion of the recent Nisqually Valley—South Puget Sound earthquake as a tool to evoke the existing reality, and gather new ideas about regional information sharing needs. While the earthquake scenario addressed a specific instance of regional cooperation, and focused primarily on incident and emergency response and management activities – it does serve to illustrate underlying institutional interactions, as well as issues and challenges faced where these interactions were not as complete as needed. This discussion then forms a basis for formulation of an initial view of institutional information sharing needs, where that cooperation is in place, and where further cooperation and information sharing is needed.

The tool used in the workshop was a graphic illustrating the state, county, cities and several operational or service entities in the region. The facilitated discussion guided the workshop participants through the actual evolution of the earthquake scenario as information sharing channels and needs were annotated on the graphic. If new entities were needed, they were added on the fly.

The resulting annotated graphic is shown at the end of Section 7. There is not intended to be a one-for-one traceability between the information sharing and coordination illustrated on the annotated graphic and the resulting regional architecture framework. Rather, the pair wise cooperation between the public and private sector entities shown are used to map the regional information sharing needs to the national ITS architecture. This mapping process results in the more detailed underlying framework to support the generalizations collected during the workshop, and as annotated on the graphic.

2.4 ADDITIONAL FOLLOW-UP

Following the regional ITS workshop, information gaps were identified and action was taken to supplement existing information by contacting stakeholders and conducting follow-up interviews. Information collected from these follow-up activities was added to the existing body of user needs and ITS inventories.

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3 Summary of User Needs

This section presents the paraphrased statement of “User Needs” as expressed by the regional operators and stakeholders—in their own language. Each stated user need has been extracted from the context of an interview, start-up information, or the workshop discussion. This extraction and formulated interpretation of user needs statements may at times appear to “put words in the mouths of” the user—that is not the primary intent; rather, it is suggested that this is necessary to derive actionable ideas from the discussion as a basis for transition and mapping to ITS User Services and User Requirements later in this process.

Several of the following user needs statements are similar if not identical in meaning. These potential duplications resulted from needs discussion statements made by separate stakeholders, or statements made by a single stakeholder that apply across multiple areas of interest. These possible duplicates have been retained in this first step of the analysis as a means to ensure complete coverage and so as not to prematurely eliminate potentially necessary detail.

As mentioned in Section 2, the stated user needs were collected and organized within the six general categories of interest: Traffic, Transit, Freight Mobility, Incident/Emergency Response & Management, Traveler Information, and Information Storage & Management.

3.1 TRAFFIC

3.1.1 Scope of Traffic User Needs Category

The Traffic category of user needs includes those needs that address the surveillance, management and control of traffic on all roadways in Thurston County. This includes needs expressed by and related to the specific needs of each operational area, and the integration of traffic operations and maintenance carried out by the Washington State Department of Transportation (WSDOT), Thurston County and the several municipalities.

The needs are listed under the headings based on the source of the need or the dominant area of applicability. The more general needs, and those that span all local jurisdictions are listed under the regional integration heading.

3.1.2 User Needs – Traffic Control and Management

3.1.2.1 Regional Cities

Need CCTV images of construction sites (e.g., 4th Avenue Bridge).

Need to reduce congestion on arterials.

Need to improve the efficiency of freeway interchanges.

Need to reduce congestion on Old Highway 99 and Capital Blvd.

Need to improve signal timing efficiency.

Need to improve the operational efficiency of roadways (e.g., city and county).

Need signal coordination on corridors (e.g., Trosper, Capital Blvd, etc.) and other key roadways.

Need to improve safety and efficiency of freight mobility on congested city streets.

Need to increase the capacity, safety and efficiency of freight mobility from industrial area around the airport to I-5.

Need to decrease traffic congestion in and around the Port of Olympia.

Need to cooperatively manage any alternate routing traffic surges on city streets due to I-5 closure—in some cases there are no parallel alternate routes.

Need to resolve any traffic signal system incompatibilities to enable coordinated operations between adjacent jurisdictions (e.g., Olympia & Lacey).

Need to improve safety and traffic control measures at interface between rural (unsignalized) and urban (signalized) roadway systems.

Need to include pedestrian information (e.g., presence of large crowds) in traffic control planning and operations, and incident response and management.

3.1.2.2 Thurston County

Need to improve the operational efficiency of roadways (e.g., city and county).

Need flood warning systems (e.g., specialized and location-specific incident detection).

Need to have monitoring and early-warning systems for flood, ice, weather, etc. (e.g., RWIS?).

Need to use digital mapping and inventory to enhance E911 dispatch (e.g., CAD?).

Need to get weather at spot locations in the county.

Need communications alternative to cell phones and radio due to dead spots in the county.

Need a resources management system for (county) vehicles, consumables, etc.

Need to collect data on snow and ice treatment and removal – time and location data.

Need to have automatic vehicle location (AVL) on the county vehicles for better management of resources and to enhance CAD.

3.1.2.3 Washington State DOT

Need to reduce commute times, reduce congestion on I-5 North from Thurston.

Need to improve the efficiency of freeway interchanges.

Need traffic CCTV on I-5 corridor in Thurston.

Need additional CCTV for traffic surveillance along I-5 in Thurston.

Need traveler information for the I-5 and US 101 corridors.

Need to extend traffic surveillance coverage to include (at least) I-5 at US 101, I-5 at City Center (105) and 101 at Black Lake.

Need to extend our (state) traffic surveillance south along I-5 through Thurston County.

Need to deliver additional driver information targeted at Thurston region (e.g., DMS, HAR).

Need to increase the efficiency and safety of high-speed passenger rail—there are several at grade crossings.

Need to expand coverage for regional transportation system status (e.g., additional HAR?).

3.1.2.4 Integration of Regional Traffic Control and Management Needs

Need traveler information on construction projects available on the web (location, text, images) or changeable message signs (location, text).

Need to improve incident detection, response and management.

Need regional signal coordination and shared control capabilities but retain local control as needed.

Need expanded and enhanced signal preemption for emergency vehicles.

Need additional portable message signs.

Need real-time traffic counts (e.g., I-5, 101, selected city and county roadways).

Need to improve roadway-rail crossing technologies to reduce traffic delays.

Need a complete digital pavement inventory, geo-coded addresses and mapping (e.g., county-wide roadway, ROW inventory).

Need mutually enhanced incident notification and incident status interchange between state, county, and all cities (e.g., SR 510, etc.).

Need inter-agency communications and cooperation (e.g., WSP, state, county, city, 911, etc.).

Need adaptive off-ramp signal timing to optimize the traffic flow off the I-5 and prevent backups.

Need to develop and use a regional digital inventory of transportation assets (e.g., roadways, signals, etc.).

Need to improve en-route driver information in the region.

Need to “formalize” the collection and dissemination of regional data and derived information for normal and exceptional operations.

Need to better communicate and coordinate among centers.

Need to provide local data and information to state for integration in Puget Sound regional status but also need to maintain capability to respond to local inquiries (e.g., from media, smaller local agencies, concerned parents, etc.).

Need to collect and integrate all sources of transportation system status data (e.g., cell phone reports, probe vehicles such as agency maintenance vehicles, law enforcement, garbage collectors, etc.).

Need to have a supply of portable message signs available for city and county uses in exceptional conditions.

Need to optimize traffic flow at I-5 interchanges (e.g., ramp metering, adaptive signal timing).

Need enhancements to regional communications infrastructure (e.g., “Light Lanes” fiber on I-5 corridor).

3.2 TRANSIT

The Transit category of user needs includes those that address actions across nine categories identified by the consultant team from the content of the interviews.

3.2.1 Travel Times and Delays

Need to reduce travel delays caused by traffic congestion.

Need to reduce travel delays caused by delays at traffic signals.

Need to reduce travel delays caused by traffic incidents.

Need to reduce travel delays caused by road construction/maintenance.

3.2.2 Security

Need to improve detection and response to security or medical incidents on vehicles.

Need to improve detection and response to security or medical incidents at stops/stations.

3.2.3 Rider Information

Need to make schedule and route information more accessible to customers.

Need to disseminate schedule and route information less expensively.

Need to be able to update schedule and route information more quickly.

Need to improve the efficiency of the customer service telephone information system.

Need to improve the consistency of information given by customer service operators.

Need to make trip planning more convenient for customers.

Need to reduce rider uncertainty regarding bus arrival times.

Need to reduce rider confusion about stop announcements.

3.2.4 Transfers

Need to improve the convenience of making transfers.

Need to improve the convenience of making transfers to other services.

Need to improve schedule adherence and on-time performance.

Need to improve ability to monitor and maintain vehicle headways/spacing.

3.2.5 Planning and Administrative

Need to improve the efficiency of collecting ridership information.

Need to improve the accuracy of ridership information.

Need to increase the amount and detail of ridership information collected.

Need to reduce the costs associated with public meetings.

Need to reach more people through public meetings.

Need to improve ability to efficiently measure changes in ridership patterns.

Need to improve ability to analyze operational data and develop and implement service changes.

Need to improve effectiveness and efficiency of data archiving.

Need to improve the efficiency of report generation and filing.

Need to increase the speed and capabilities of computer workstations.

3.2.6 Service Coverage

Need to provide more service to low-density areas.

3.2.7 Fare Collection

Need to make fare payment more convenient for customers.

Need to reduce the costs/increase the efficiency of fare collection and handling.

Need to improve the reliability of fare collection equipment.

Need to reduce time required to collect fare collection data from individual vehicles, and to format for analysis.

Need to improve ability to support more sophisticated fare schemes (e.g., distance-based).

Need to increase the amount of information collected via fare collection equipment.

3.2.8 Maintenance

Need to improve the ability to identify the need for preventative vehicle maintenance.

Need to increase the accuracy and efficiency of inventory functions.

3.2.9 Miscellaneous

Need to improve the efficiency of scheduling/run-cutting.

Need to reduce inefficiencies resulting from paratransit ride cancellations.

Need to increase the efficiency of paratransit ride confirmation call-back process.

Need to improve ability to serve paratransit same-day trip requests.

3.3 FREIGHT MOBILITY

The Freight Mobility category of user needs includes those needs that address the safe and efficient movement of freight by truck and rail in the region. This includes the expressed needs of both the rail and trucking industry for specialized access, routing and status information of use to them in their freight business enterprise.

3.3.1 User Needs – Freight Mobility

Need to provide traveler information on alternate routes to and from the Port of Olympia.

Need to have weigh-in-motion capabilities in Thurston to minimize delays in freight movement on the I-5 and other alternate freight corridors.

Need to improve rail access and switching efficiency for Port of Olympia.

Need signal priority for freight mobility on I-5 to Plum Street to Port corridor.

Need to use weigh-in-motion and electronic tags in commercial vehicles to enhance safety and efficiency of majority of operators; refocus more effective enforcement on illegal or unsafe operators.

Need to have regional information package on transportation system status (e.g., traffic congestion, roadway closures, construction, restrictions, weather, etc.) specifically targeted at freight mobility and commercial operators.

Need to have driver information include restrictions applicable to freight mobility and commercial operations (e.g., height, width, flammables, weather, etc.).

Need to provide a capability for electronic financial transactions for commercial vehicle permits and taxes; web-based.

3.4 INCIDENT/EMERGENCY RESPONSE AND MANAGEMENT

The Incident/Emergency Response and Management category of user needs includes those needs that address the detection, coordinated response and management of incident and other emergency situations—whether planned or unplanned. This includes expressed needs of both the traffic management and incident or emergency response operators for signal preemption, specialized routing, real-time roadway and hospital status information of use to them in improving their response.

3.4.1 User Needs -- Incident/Emergency Response and Management

Need to have a pre-planned incident response plan, including detour routes.

Need on-scene and en-route video data link from vehicles to E911 center, also Internet access from vehicles.

Need fixed and mobile CCTV surveillance and digital camera for emergency response and incident management (e.g., on-scene status reports with pictures or video).

Need inter-agency communications and cooperation (e.g., WSP, state, county, city, 911, etc.).

Need short-range FM broadcast for localized traveler information, traffic control and incident management.

Need traveler information signs at I-5/101 interchange.

Need to know the real-time status of regional trauma centers: St. Peters and then Madigan.

Need to know traffic and road weather conditions affecting major regional employers (e.g., State government , Ft. Lewis).

Need to improve centralized situation data collection and information dissemination during a crisis or unusual circumstances (e.g., earthquake, flood, I-5 closure, etc.).

Need to improve real-time access to situation data for fire and EMS response (e.g., mobile data terminals, provide real-time info to a dispatcher who then provides updates to fire and EMS vehicles, etc.).

Need to “formalize” the collection and dissemination of regional data and derived information for normal and exceptional operations.

Need to better communicate and coordinate among centers.

Need to have KGY (regional emergency radio broadcast) and TCTV (regional TV alert) actively involved and informed in status of all transportation systems – especially during exceptional conditions.

Need to cooperate with higher regional agencies (e.g., state, Camp Murray) in the sharing of local operational, incident and emergency response status data and information.

Need to have AVL on incident and emergency response vehicles to minimize the “where are you” radio and cell phone chatter.

Need to have a supply of portable message signs available for city and county uses in exceptional conditions.

3.5 TRAVELER INFORMATION

The Traveler Information category of user needs includes those needs that address the formulation of data into information suitable for distribution to the traveling public. This constituency includes: commuters during morning and evening peaks, generic travelers (e.g., tourists, shoppers), commercial operators, transit riders, incident/emergency response operators and public agency vehicle operators. With the exception of delivery to incident/emergency response and public agency users, this traveler information is regional and general, it is not tailored to a specific user requirement (e.g., my route to and from work) but serves the general public constituency's need to know about the status of the regional transportation systems. Incident/emergency response and public agency vehicle operators will typically require more specific, tailored information targeted at the route and conditions to/from a specific location.

The information can consist of information useful for pre-trip planning and en-route updates to drivers provided through broadcast or specific user requested means (e.g., radio, TV, internet, 1-800 dial in, message signs, highway advisory radio, etc.).

3.5.1 User Needs -- Traveler Information

Need to provide traveler information on alternate routes to and from the Port of Olympia.

Need to provide traveler and commercial freight operators with roadway congestion information.

Need a regional Smart Card system (e.g., transit, ferry, toll bridges, Central Puget Sound).

Need a regional trip planner capability coordinated with all of Puget Sound region.

Need accurate, integrated, near real-time regional weather conditions and forecast.

Need integrated state, county and city traveler information for the region.

Need tailored traveler and system status information for use by the school districts, their transportation systems, the students and their parents.

Need to provide local data and information to WSDOT for integration in Puget Sound regional status but also need to maintain capability to respond to local inquiries (e.g., from media, smaller local agencies, concerned parents, etc.).

Need traveler information kiosks at large employment centers (e.g., state capital).

3.6 INFORMATION STORAGE AND MANAGEMENT

The Information Storage and Management category of user needs includes those needs that address the collection, storage, synthesis and integration of data for real-time use or for archival purposes.

3.6.1 User Needs -- Information Storage and Management

Need to deploy air quality measurement capabilities.

Need to ensure data security and protection of critical information infrastructure.

Need to collect transit operational data for reporting and planning analysis (e.g., passenger counts).

Need to improve inter-agency sharing of data and information (e.g., WSP accident data).

Need to resolve issues with sharing of proprietary or business sensitive data to enable regional and statewide trip planning capabilities.

Need to collect and integrate data across agency, diverse vendor/manufacture systems.

Need to collect and integrate all sources of transportation system status data (e.g., cell phone reports, probe vehicles such as agency maintenance vehicles, law enforcement, garbage collectors, etc.).

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4 Tracing User Needs to User Services

4.1 INTRODUCTION TO USER SERVICES MAPPING

The purpose of this section is to transition from the user needs statements and remarks into the somewhat more standard language of the National ITS Architecture. This first step consolidates and correlates the user needs items developed in Section 3 to their corresponding high-level User Service(s) category.

The mapping of these action items establishes the basis for an architecture statement about the planned or unplanned ITS projects that would fulfill the stated needs of the Thurston region's stakeholders and agencies.

4.2 DEFINITION OF USER SERVICES

In simple terms, the ITS User Services state: **“What ITS should do”** from the user's perspective. The user services consider and address a broad range of ITS users including the traveling public as well as many different types of system operators. The concept of using user services allows system or project definition to begin and be better understood by establishing the high-level services that will be provided to address identified capabilities, problems and needs. In this process, regionally unique or tailored user services can be developed in the same style as those already contained in the National ITS Architecture; additionally, new or updated user services may be added to the national architecture over time.

Another term used when dealing with User Services is: User Service Bundle. These bundles are logical groupings of user services that provide a convenient way to discuss the range of requirements in a broad user stakeholder or operational area. In the National ITS Architecture, the highest-level User Services are grouped into seven bundles:

- Travel and Traffic Management (1.0),
- Public Transportation Management (2.0),
- Electronic Payment (3.0),
- Commercial Vehicle Operations (4.0),
- Emergency Management (5.0),
- Advanced Vehicle Safety Systems (6.0), and
- Information Management (7.0).

Lastly, there is a new user service under development by the national ITS architecture program—**Operations and Maintenance**. This emerging user service has been included in this mapping as a component of Travel and Traffic Management.

4.3 CONSOLIDATION AND CORRELATION OF IDENTIFIED INVENTORY AND ACTION ITEMS TO USER SERVICES

The lists in Section 3 above enumerated the user's stated need comment from the interviews or workshop. These were then used to identify and extract items in user or stakeholder language and terminology. This section lists these user need action items and then maps them to one or more appropriate ITS User Services. This is also the first step in the process of "distillation" to extract the non-duplicative content from the variety of user needs statements, comments and sources listed above, and to turn those into User Services for current capabilities as well as desired planned or unplanned future capabilities.

The mapping of a user need (a row) to a user service (a column) is indicated in the table with a dot in the intersecting cell. This comparison matrix is also available in its native Excel file format as: [User Needs vs User Services.xls](#).

4.4 DEFINITION OF IDENTIFIED USER SERVICES

Thus, we have developed a list of regional User Services for the architecture—these are the user services that are needed (new) or that require enhanced capabilities (legacy capability upgrade or replacement). The following list illustrates the collection of ITS user services of interest within the Thurston Regional ITS Architecture.

The numbers in the cells of the table indicate the number of times that the user service was mapped from a user need. This is not intended as an indication of ranking or priority but is provided for information purposes. If and only if all statements of user needs were discrete (they are not yet so in this case) – then the counts would indicate a clearer preference for action.

User Services	Traffic Control and Management	Transit	Freight Mobility	Incident/Emergency Response and Management	Traveler Information	Information Storage and Management
Travel and Traffic Management						
Pre-Trip Travel Information	7	3	3	3	8	
En-Route Information	9	3	3	4	2	
Route Guidance	1	3	1	3	2	
Ride Matching & Reservation		1			2	1
Traveler Services Information		1				
Traffic Control	34	6	1	4		1
Incident Management	15	4		13		2
Travel Demand Management	2	1				
Emissions Testing and Mitigation						1
Highway-Rail Crossing Safety	1	2				
Operations and Maintenance	15	5		4		1
Public Transportation Management						
Public Transportation Management		41		1	1	1
En-Route Transit Information		9				
Personalized Public Transit		8				
Public Travel Security		2				

User Services	Traffic Control and Management	Transit	Freight Mobility	Incident/Emergency Response and Management	Traveler Information	Information Storage and Management
Electronic Payment ⁽¹⁾						
Electronic Payment Services		6			1	
Commercial Vehicle Operations						
Commercial Vehicle Electronic Clearance			3			
<i>Automated Roadside Safety Inspection</i>						
On-Board Safety Monitoring			1			
Commercial Vehicle Administrative Processes			2			
<i>Hazardous Material Incident Response</i>						
Commercial Fleet Management			5	1	2	
Emergency Management						
Emergency Notification & Personal Security				1		
Emergency Vehicle Management	10	3		8		1
Advanced Vehicle Safety Systems ⁽¹⁾						
Longitudinal Collision Avoidance		1				
Lateral Collision Avoidance		1				
Intersection Collision Avoidance		1				
Vision Enhancement for Crash Avoidance		1				
Safety Readiness		1				
Pre-Crash Restraint Deployment		1				
Automated Vehicle Operation		2				
Information Management						
Archived Data Function	1	1		1		7

Notes: (1) Electronic Payment and Advanced Vehicle Safety Systems user needs were mentioned exclusively in the transit interview discussions and then in the mapping to the national ITS architecture user services. It is suggested at this point in the analysis that both categories should be mentioned separately; but that in the final analysis, combination with other transit user services would be a better, simpler regional solution.

5 Extension of User Services to User Requirements

5.1 INTRODUCTION TO USER REQUIREMENTS

5.1.1 Process for extension of user services to user requirements

The User Services identified in Section 4 above trace directly to high-level statements of requirements in the National ITS Architecture. These high-level Users Service Requirements are enumerated below. They have been tailored for relevancy and application in the Thurston Regional ITS architecture.

5.1.2 The SHALLS, WILLS, and SHOULD

The User Service Requirements derived from the mapping of User Needs to User Services are enumerated in the following table.

1.0 TRAVEL AND TRAFFIC MANAGEMENT

1.1 PRE-TRIP TRAVEL INFORMATION

1.1.0 Thurston Regional ITS shall provide a Pre-Trip Travel Information (PTTI) capability to assist regional travelers, public agencies and commercial operators in making mode choices, travel time estimates, and/or route decisions prior to trip departure.

Thurston Regional PTTI will consist of three major functions, which are: (1) Current Situation Information, (3) Trip Planning Service, and (4) User Access. Information will be integrated from various transportation modes and presented to the user for their information and decision-making.

1.2 EN-ROUTE DRIVER INFORMATION

1.2.0 Thurston Regional ITS shall include an En-Route Driver Information function. Driver Information provides vehicle drivers with traffic and roadway status information, while en-route, which will allow alternative routes to be chosen for their destination.

Driver Information consists of two major functions which are (1) Driver Advisory and (2) In-vehicle Signing.

1.3 ROUTE GUIDANCE

1.3.0 Thurston Regional ITS shall include a Route Guidance function. Route Guidance will provide travelers with directions to selected destinations.

Four Route Guidance functions are potentially provided, these are: (1) Provide Directions, (2) Static Mode, (3) Real-Time Mode, and (4) User Interface.

1.4 RIDE MATCHING AND RESERVATION

1.4.0 Thurston Regional ITS shall include a Ride Matching function. Ride Matching will provide travel users with information on rideshare providers.

Three major functions are provided which are (1) Rider Request, (2) Transportation Provider Services, and (3) Information Processing.

1.5 TRAVELER SERVICES INFORMATION

1.5.0 Thurston Regional ITS shall include a Traveler Services Information function. Traveler Services Information provides travelers with service and facility data for the purpose of assisting prior to embarking on a trip or after the traveler is underway.

The two functions included in this capability are: (1) Information Receipt and (2) Information Access.

1.6 TRAFFIC CONTROL

1.6.0 Thurston Regional ITS shall provide a seamless city, county and state Traffic Control capability. Traffic Control provides the capability to efficiently manage the movement of traffic on streets and highways. This will also include control of network signal systems with eventual integration of freeway and arterial control.

Four functions are provided which are: (1) Traffic Flow Optimization, (2) Traffic Surveillance, (3) Control Function, and (4) Provide Information.

1.7 INCIDENT MANAGEMENT

1.7.0 Thurston Regional ITS shall include an Incident Management function. Incident Management will identify incidents, formulate response actions, and support initiation and ongoing coordination of those response actions.

Six major functions are provided which are: (1) Scheduled/Planned Incidents, (2) Identify Incidents, (3) Formulate Response Actions, (4) Support Coordinated Implementation of Response Actions, (5) Support Initialization of Response to Actions, and (6) Predict Hazardous Conditions.

1.8 TRAVEL DEMAND MANAGEMENT

1.8.0 Thurston Regional ITS Travel Demand Management will generate and communicate management and control strategies that will support and facilitate the implementation of TDM programs, policies and regulations.

It consists of two major functions which are: (1) Increase Efficiency of Transportation System and (2) Provide Wide Variety of Mobility Options.

1.9 EMISSIONS TESTING AND MITIGATION

1.9.0 Thurston Regional ITS shall include an Emission Testing and Mitigation Function. This function will provide state and local governments with the capability to enhance their air quality control strategies. It will provide both wide area and roadside emissions monitoring. Information may be provided to enforcement agencies to compel offenders to comply with standards.

1.10 HIGHWAY-RAIL INTERSECTION

1.10.0 Thurston Regional ITS shall include a Highway-Rail Intersection function to control highway and rail traffic in at-grade crossings.

Two sub-services are supported: (1) Standard Speed Rail which is applicable to light rail transit, commuter rail and heavy rail trains with operational speeds up to 79 miles per hour (MPH); and (2) High Speed Rail which is applicable to all passenger and freight trains with operational speeds from 80 to 125 MPH.

1.X OPERATIONS AND MAINTENANCE

1.X.0 Thurston Regional ITS shall include an Operations and Maintenance function. This function will provide ...

Several subservices are included in Operations and Maintenance, these are: (1) ..., (2) ..., (3) ...

2.0 PUBLIC TRANSPORTATION MANAGEMENT

2.1 PUBLIC TRANSPORTATION MANAGEMENT

2.1.0 Thurston Regional ITS shall include a Public Transportation Management function.

2.2 EN-ROUTE TRANSIT INFORMATION

2.2.0 Thurston Regional ITS shall include an En-Route Transit Information function. En-Route Transit Information provides travelers with real-time transit and high-occupancy vehicle information allowing travel alternatives to be chosen once the traveler is en-route. This capability integrates information from different transit modes and presents it to travelers for decision-making.

It consists of three major functions which are: (1) Information Distribution, (2) Information Receipt, and (3) Information Processing.

2.3 PERSONALIZED PUBLIC TRANSIT

2.3.0 Thurston Regional ITS shall include a Personalized Public Transit function.

2.4 PUBLIC TRAVEL SECURITY

2.4.0 Thurston Regional ITS shall include a Public Travel Security function to create an environment of safety in public transportation.

3.0 ELECTRONIC PAYMENT ⁽¹⁾

3.1 ELECTRONIC PAYMENT SERVICES ⁽¹⁾

3.1.0 Intercity Transit ITS shall include an Electronic Payment capability. Electronic Payment Services allows travelers to pay for transportation services by electronic means.

One function is provided: Electronic Fare Collection.

4.0 COMMERCIAL VEHICLE OPERATIONS

4.1 COMMERCIAL VEHICLE ELECTRONIC CLEARANCE

4.1.0 Thurston Regional ITS shall include a Commercial Vehicle Electronic Clearance capability.

4.3 ON-BOARD SAFETY MONITORING

4.3.0 Thurston Regional ITS shall include an On-Board Safety Monitoring function, that provides monitoring and warnings of safety problems. Of primary importance is to inform the driver, as soon as possible, of any problem that has been detected. Of secondary importance is notifying the carrier of detected safety problems. Last in importance is the notification of appropriate enforcement agencies.

4.4 COMMERCIAL VEHICLE ADMINISTRATIVE PROCESSES

4.4.0 Thurston Regional ITS shall include a Commercial Vehicle Administrative Process function.

This will consist of two services to include: (1) Electronic Purchase of Credentials, and (2) Automated Mileage and Fuel Reporting and Auditing.

4.6 COMMERCIAL FLEET MANAGEMENT

4.6.0 Thurston Regional ITS shall include a Commercial Fleet Management function.

5.0 EMERGENCY MANAGEMENT

5.1 EMERGENCY NOTIFICATION AND PERSONAL SECURITY

5.1.0 Thurston Regional ITS shall include an Emergency Notification And Personal Security function that provides for the faster detection and reporting of accidents, and receipt of notification by travelers involved in an incident.

5.2 EMERGENCY VEHICLE MANAGEMENT

5.2.0 Thurston Regional ITS shall include an Emergency Vehicle Management Service.

6.0 ADVANCED VEHICLE SAFETY SYSTEMS ⁽¹⁾

6.1 LONGITUDINAL COLLISION AVOIDANCE ⁽¹⁾

6.1.0 Intercity Transit ITS shall include a Longitudinal Collision Avoidance Service.

6.2 LATERAL COLLISION AVOIDANCE ⁽¹⁾

6.2.0 Intercity Transit ITS shall include a Lateral Collision Avoidance Service.

6.3 INTERSECTION COLLISION AVOIDANCE ⁽¹⁾

6.3.0 ITS shall include an Intersection Crash Collision Avoidance Service.

6.4 VISION ENHANCEMENT FOR CRASH AVOIDANCE ⁽¹⁾

6.4.0 Intercity Transit ITS shall include a Vision Enhancement for Crash Avoidance Service.

6.5 SAFETY READINESS ⁽¹⁾

6.5.0 Intercity Transit ITS shall include a Safety Readiness Service.

6.6 PRE-CRASH RESTRAINT DEPLOYMENT ⁽¹⁾

6.6.0 Intercity Transit ITS shall include the Pre-Crash Restraint Deployment Service.

6.7 AUTOMATED VEHICLE OPERATION ⁽¹⁾

6.7.0 ITS shall include a Automated Vehicle Operation Service

7.0 INFORMATION MANAGEMENT**7.1 ARCHIVED DATA FUNCTION**

7.1.0 Thurston Regional ITS shall provide an Archived Data Function to control the archiving and distribution of ITS data. The Archived Data User Service helps achieve the ITS information goal of unambiguous interchange and reuse of data and information throughout all functional areas.

The Archived Data User Service provides the Historical Data Archive Repositories and controls the archiving functionality for all ITS data with five major functions: (1) the Operational Data Control function to manage operations data integrity, (2) the Data Import and Verification function to acquire historical data from the Operational Data Control function, (3) the Automatic Data Historical Archive function for permanently archiving the data, (4) the Data Warehouse Distribution function which integrates the planning, safety, operations, and research communities into ITS and processes data products for these communities; and (5) the ITS Community Interface which provides the ITS common interface to all ITS users for data products specification and retrieval.

Notes: (1) Electronic Payment and Advanced Vehicle Safety Systems (seven sub-elements) user needs were mentioned exclusively in the transit interview discussions and then in the mapping to the national ITS architecture user services. It is suggested at this point in the analysis that both categories of user services should be mentioned separately; but that in the final analysis, combination with other transit user services would be a better, simpler regional solution.

6 Inventory of Existing and Planned ITS

6.1 INTRODUCTION TO INVENTORY OF EXISTING ITS

The purpose of this section is to present the inventory of existing ITS technologies that are now deployed and operational in the Thurston region. Additionally, this section includes ITS capabilities and ideas that are or will be planned for implementation. All stated future ITS ideas were recorded and are included here. At this point in the analysis, it is too soon to discriminate between those ideas that are near-term (e.g., 0-5 years) and those that are long-term (e.g., <20 years), or to differentiate those that are budgeted or not.

6.2 EXISTING INVENTORY EXPRESSED AS USER SERVICES

The following table enumerates the existing Thurston Regional ITS capabilities in terms of user services. This table is based on the analysis and extraction of interview and workshop comments as shown in Appendix C.

Associated with each entry is a brief remark intended to capture the essence of the legacy ITS in terms of its scope of user service completeness, limitations and level of regional integration. All of these assessments are based on a qualitative and subjective analysis of the interview and workshop discussions and will be refined as the project proceeds. This explanatory remark is key in the determination of future ITS project actions to enhance or replace with new capability.

The scope of “**user service completeness**” is expressed on a scale of: minimal, moderate, or complete service. The “**limitations**” are expressed in terms of geography, functionality, institutional partnerships, or type of sharing (e.g., City of Olympia only, email and fax only, no real-time operational data exchange, etc.). The “**level of regional integration**” is expressed as a percentage with 0% = none, and 100% = total integration as compared to what is possible within the framework of the National ITS Architecture¹. Again, these remarks are intended to set the stage for a consensus understanding of what ITS is deployed and how it needs to be enhanced or replaced.

¹ Note that this is a popular metric used by the US DOT to examine the degree of integration and “completeness” of regional ITS as compared to what is possible within the framework of the National ITS Architecture. It may be the case that for some ITS, 100% integration is not relevant in Thurston Region—so lower numbers should not be viewed as a bad thing at this point in the analysis.

<u>User Service</u>	<u>No.</u>	<u>Remark: Completeness, Limitations, Degree of Integration</u>
<u>Travel and Traffic Management</u>		
Pre-Trip Travel Information	1.1	Minimal; data/info points for cities, county; not integrated (0%) WSDOT has extensive info on I-5, passes and incidents but not yet in Thurston county. Some jurisdictions provide 1-800 access but are easily overwhelmed in exceptional situations.
En-Route Driver Information	1.2	Moderate; HAR, broadcast radio, message signs; some integration (10%)
Route Guidance	1.3	Minimal; static routing for emergency response; not integrated (0%)
<i>Ride Matching and Reservation</i>	1.4	None
<i>Traveler Services Information</i>	1.5	None
Traffic Control	1.6	Moderate; cities and state; not integrated (0%) Cities do signal timing and some coordination at boundaries. No message signs or ramp metering. No real time data exchange.
Incident Management	1.7	Moderate; cities, county and state/WSP; some integration (20%) No real-time data sharing. Use radio and phone.
Travel Demand Management	1.8	Moderate; schools, cities, county, state; some integration (10%) Schools post info to advise on closures. Jurisdictions use broadcast radio and WSDOT web site to alert travelers to situations that would influence their demand on the system.
<i>Emissions Testing and Mitigation</i>	1.9	None
Highway-Rail Intersection	1.10	Minimal; actuated crossings; not integrated (0%) High-speed rail and freight have several actuated crossings. No real-time data sharing.
<i>Operations and Maintenance</i>	1.x	N/A
<u>Public Transportation Management</u>		
Public Transportation Management	2.1	Moderate; fixed-route operations; some integration with regional transit (10%) Intercity provides fixed-route service and has needs for vehicle tracking, fleet management systems, etc.
<i>En-Route Transit Information</i>	2.2	None
Personalized Public Transit	2.3	Moderate; provided by?; not integrated (0%)
<u>Electronic Payment</u>		
<u>Commercial Vehicle Operations</u>		
Commercial Vehicle Electronic Clearance	4.1	Minimal; WIM in Washington but not Thurston; not integrated (0%) WIM is implemented along I-5 but not yet in Thurston region.
<i>Automated Roadside Safety Inspection</i>	4.2	None
<i>On-Board Safety Monitoring</i>	4.3	None
<i>Commercial Vehicle Administrative Processes</i>	4.4	None
<i>Hazardous Material Incident Response</i>	4.5	None
<i>Commercial Fleet Management</i>	4.6	None
<u>Emergency Management</u>		
Emergency Notification and Personal Safety	5.1	Moderate; CAPCOM/911 and jurisdictional level; some integration (10%) WSDOT and WSP tightly integrated for I-5, US 101, etc. CAPCOM/911 and local jurisdictions use phone, radio for detection and status but no real-time data exchange.

<u>User Service</u>	<u>No.</u>	<u>Remark: Completeness, Limitations, Degree of Integration</u>
Emergency Vehicle Management	5.2	Moderate; (same as above); some integration (10%) Response vehicles have signal preemption. WSDOT & WSP are well-coordinated.
<u>Advanced Vehicle Safety Systems</u>		
None		
<u>Information Management</u>		
Archive Data Function	7.1	Minimal; GIS only; not integrated (0%) No mention of data archiving—GIS and digital inventories of right-of-way exist or in progress.

6.3 IDEAS FOR PLANNED ITS

This is clearly one area that requires additional focused discussion and follow-up action with key individual stakeholders, or stakeholder focus groups (e.g., WSDOT, cities, county, emergency management, etc.). There were very few planned ITS projects mentioned in the interviews and workshop discussions. We will continue to develop these ideas as we proceed with the project process.

The identified plans for future Thurston Regional ITS include:

<u>User Service</u>	<u>No.</u>	<u>Stated plan for future ITS:</u>
<u>Travel and Traffic Management</u>		
Pre-Trip Travel Information	1.1	
En-Route Driver Information	1.2	
Route Guidance	1.3	
Ride Matching and Reservation	1.4	
Traveler Services Information	1.5	
Traffic Control	1.6	WSDOT plans to extend traffic surveillance coverage south on I-5 through Thurston County, and at other key locations on state roadways (e.g., US 101 at Black Lake, 101 at SR 8, etc.). This will include traffic detection and CCTV for traffic images. The City of Olympia is installing CCTV to observe and record construction and traffic flows at the 4 th Avenue Bridge; these CCTV are expected to be a legacy for future traffic surveillance use.
Incident Management	1.7	Thurston County 911 plans to install Computer Aided Dispatch (CAD) systems in all police vehicles.
Travel Demand Management	1.8	
Emissions Testing and Mitigation	1.9	
Highway-Rail Intersection	1.10	
Operations and Maintenance	1.x	Thurston County wants to integrate Intercity (transit) radio systems with their fleet system.
<u>Public Transportation Management</u>		
Public Transportation Management	2.1	Intercity plans a radio system upgrade; also Smart Card system to be compatible with that being developed for the Central Puget Sound systems.
En-Route Transit Information	2.2	
Personalized Public Transit	2.3	

<u>User Service</u>	<u>No.</u>	<u>Stated plan for future ITS:</u>
<u>Electronic Payment</u>		
<u>Commercial Vehicle Operations</u>		
Commercial Vehicle Electronic Clearance	4.1	WSDOT will complete the upgrade of the weigh station located on I-5 at Nisqually. This enhancement will meet the requirements for 4.1, 4.2 and portion of 4.4.
Automated Roadside Safety Inspection	4.2	(See 4.1 above)
On-Board Safety Monitoring	4.3	
Commercial Vehicle Administrative Processes	4.4	(See 4.1 above) Additionally, the System Network for Oversize/Overweight Permit Information (SNOOPI) is on-line, and a web site for electronic filing of registration information is under development.
Hazardous Material Incident Response	4.5	
Commercial Fleet Management	4.6	
<u>Emergency Management</u>		
Emergency Notification and Personal Safety	5.1	
Emergency Vehicle Management	5.2	
<u>Advanced Vehicle Safety Systems</u>		
<u>Information Management</u>		
Archive Data Function	7.1	Thurston County is conducting a complete digital inventory and ROW survey. This will form a basis for future ITS accuracy in fleet management and incident response.

7 Baseline for Data Sharing Needs, Process Specifications and Institutional Cooperation

7.1 INTRODUCTION TO BASELINE SECTION

This section is intended to identify several baseline needs that will aid understanding of the Thurston Regional architectural needs and initiate the process of developing an architectural framework, implementation strategy and project planning.

At this point in the project--following analysis of interview and workshop discussions--the information available to address these baseline needs remains at a high-level. This will be remedied in the next few steps in the project process as information already collected is organized and mapped to the National ITS Architecture, and tailored to the operational and institutional needs situation in Thurston County.

7.2 INSTITUTIONAL COOPERATION AND INFORMATION SHARING

This section identifies the needs for institutional cooperation between Thurston regional agencies to share information and coordinate their activities during normal operations and under exceptional conditions. The following table (Table 7-1) provides an initial summary of the intended "partnerships" for this institutional cooperation expressed as the "From" and "To" partners. Table 7-1 identifies organizational pairs, between which information will be shared--this should be interpreted as bi-directional information sharing and cooperation for all pair-wise combinations unless otherwise determined through subsequent analysis within the framework of the National ITS Architecture and compared to Thurston's regional needs. This same information is refined and provided in more detail in the tailored system diagrams in TM #2 (see Appendix E, TM #2).

This section also identifies the top-level needs for sharing data between Thurston Regional ITS centers, systems and devices. This initial step will be stated first at a conceptual level above that of the "architecture flow", then will be mapped to an initial selection of architecture flows. The exact derived architecture flows will be included in the architecture framework developed and presented in Technical Memorandum #2 – Thurston Region System Architecture. Since additional analysis will be applied to the information in the process of developing the architecture details, TM #2 shall take precedence over the initial top-level information results expressed herein.

The following table provides a summary of anticipated information sharing and institutional cooperation needs between Thurston Region public and private entities:

Table 7-1: Information Sharing Potential and Institutional Cooperation

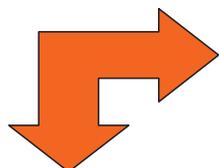
Stakeholder Pairs for Information Sharing		Information Content
Tacoma TOC	Thurston County, regional cities	Traffic counts, speeds, images of traffic for operational or informative uses
Tacoma TOC	Regional Information Service Providers (ISP) (e.g., the media, Internet, private "fee-for-service" entities)	General status of the roadway network, incidents, restrictions, closures, construction
Tacoma TOC, Thurston County	State or County maintenance vehicles	Vehicle probe data, speed, location
Tacoma TOC, WSDOT	Media, emergency management centers, regional ISPs	Information disseminated to the travelers/drivers en-route, by broadcast or interactive means
Tacoma TOC	WSDOT, Thurston County, cities	Traffic signal coordination information, timing plans
Tacoma TOC	Thurston county, cities, emergency responders	Freeway/state route traffic incident reports and status
Emergency responders	WSDOT, Tacoma TOC, county and cities, other EM (WSP, local police, fire, medical)	Incident response status, location, severity, resource needs
WSDOT, Tacoma TOC	Regional ISP, Intercity Transit, county and cities, parking facilities	Traffic demand information
Event promoters	WSDOT, Tacoma TOC, regional ISP, Intercity Transit, county and cities, parking facilities	Traffic demand management info for special events
Tacoma TOC, county, cities	Rail Operations	Roadway-rail blockages, incidents
Rail Operations	Tacoma TOC, county, cities	Rail schedules, incidents affecting roadways at crossings
Intercity Transit	Regional ISP	Transit operational information, schedules, fares, on-time performance
Intercity Transit	Thurston county, cities	Transit operational info, incidents, transit vehicle probe data for traffic status
Intercity Transit	Special needs transportation, regional ISP	Service coordination, demand responsive request and service response, routes, fares, etc.
Intercity Transit	Emergency management (911), regional ISP	Transit security incident notification, location, severity
Intercity Transit	County and city traffic management	Signal priority authorization, requests
Regional ISP	Media, Tacoma TOC, county or cities traffic centers, Internet, vehicles	Broadcast (one-way) or interactive (two-way, query-response) traveler information
WSDOT, local or national weather service	Tacoma TOC, county and cities, regional ISP, emergency management facilities	Current weather conditions, forecasts
WSDOT Commercial vehicle division, weigh-stations, WSP	Commercial vehicles, fleet/freight management facilities	Driver and vehicle info, credentials, screening and clearance, compliance, etc.
Thurston County 911, WSP, local police/fire/medical	WSDOT, Tacoma TOC, other county agencies or cities EM or traffic operations	Incident status, dispatch coordination, traffic conditions en-route or as a consequence
TRPC, WSDOT	Thurston county, cities	ITS operational data repository info of all types: traffic, transit, incident, weather, construction & maintenance, commercial vehicles, etc.

The general "Information Content" shown in the far right column of Table 7-1 can then be mapped to an ITS architecture flow which is most likely to provide the information sharing interface in the resulting Thurston Region architecture. The results of this initial mapping are contained in Table 7-2 below. The columns in this table generalize the cooperating institutions into the six areas of interest: traffic, transit, freight mobility, incident/emergency response and management, traveler information, and information storage and management. An added column is provided to indicate external agencies or business enterprises not yet identified in the stakeholder discussions and needs analysis. The table cells also illustrate that there may be a necessary distinction between information sources ("S") and information users ("U")—this distinction identifies the directional flow of information, and could determine regional responsibility and funding profiles for information acquisition. But, in most cases, there are both multiple sources and multiple users; and, a source is most likely also a user of the information they collect.

As mentioned above, additional analysis will be applied to the information in Table 7-2 in the process of developing the more exact architecture details. Thus, the results expressed in TM #2 shall take precedence over the initial top-level information results expressed herein.

Table 7-2: Initial Mapping of Information Content to Architecture Flows

For these proposed information exchanges (below), there is a suggested "Source" and one or more "Users" of that information (on the right). In some cases, there can be multiple sources with an implicit "integration" performed by a designated public or private entity (e.g., WSDOT, an ISP, etc.). A source is also a user in that a source creates the information from its operational data, uses it for its own operational needs, and then shares the resulting information with other "Users".



Information Exchanged	Information Sources (S) and Users (U)						
	Traffic	Transit	Freight Mobility	Incident/Emergency Response & Management	Traveler Information	Information Satorage & Management	Other (e.g., external public or private entities)
Archive Information Coordination	U	U					
Broadcast Traveler Information	S	S	U	S	U	S	
Current Transportation Network Conditions	S	S	U	U	U	U	
CVO Credentials Information	S		U				
CVO Screening Information/Clearance	S		U			U	
Demand Management Information	S				U	U	
Demand Responsive Transit Information		S			U	U	
Driver (En-Route) Information	S	U	U	U	U	U	
Emergency Dispatch and Response Status	U	U		S			
Emergency Notification and Acknowledgement	S	U		S		U	
Emergency Response Routing Information	U	U		S		U	
Emergency Traffic Control Preemption Request/Status	S			S		U	
Event Plans	U	U			U		S
Highway-Rail Intersection (Crossing) Advisories	S		S		U	U	
Highway-Rail Intersection (Crossing) Status	S		S			U	
Incident Report	S	S		S		U	
Incident Response Coordination				S			S
Incident Status Information	U	U		S		U	
Integrated Archive Data Products	U	U		U		S	
Interactive Traveler Information			U		U		S
Inter-modal Freight Operations Information	U		S		U	U	
Rail Schedules (e.g., Passenger, Freight)			S		U	U	
Roadway Construction, Closures, Restrictions	S	U	U	U	U	U	
Route Plan (Emergency/Incident Response)				S			S
Traffic Control Coordination	S			U	U		
Traffic Images	S			U	U		
Traffic Information	S	U			U	U	
Traffic Information Coordination	S				U	U	
Traffic Information For Transit	S	U					
Transit Coordinated Connection Information (e.g., Public, Private, Special Needs)		S			U		
Transit Emergency Notification		S		U		U	
Transit Incident Information		S		U	U	U	
Transit Parking (e.g., Park-And-Ride) Coordination		S			U		
Transit Schedule And Fares		S			U	U	
Transit Traffic Signal Control Priority Request/Status	S	S					
Transit Traveler Information		S			U		
Transit Vehicle Locations		S		U	U	U	
Transit Vehicle Schedule Performance	U	S			U	U	
Weather Information	U	U	U	U	U	U	S

Tailored descriptions of these architecture flows can be found in Section 8 – Glossary of Terms and Definitions.

7.3 INFORMATION SHARING NEEDS BASED ON EARTHQUAKE SCENARIO

As mentioned in Section 2, an annotated graphic was developed in the Workshop #1 discussion. This discussion centered on regional interaction and response to elicit information sharing from two perspectives: the “actual” information sharing for the earthquake that occurred on February 28, 2001; and anticipated “needs” should such an event (or similar regional emergency) reoccur. Further, exclusive of specific information sharing, the discussion and annotation process served to establish a baseline for existing and needed institutional relationships. The majority of these relationships were of course focused on this scenario, but underlying those discussed are included the “normal” day-to-day interactions between these same institutional entities in less than/other than emergency circumstances.

The resulting annotated graphic is shown on the next pages. The information content of this illustration has been extracted and considered in the preparation of tables 7-1 and 7-2 above, and is also used in preparation and determination of the regional architecture in Tech Memo #2. A full-sized version (rotated ANSI E -- 44" x 34") of this graphic is available in native Visio format as file: [Scenario Chart 1](#).

8 Glossary of Terms and Definitions

8.1 GLOSSARY OF TERMS/ACRONYMS

The following table includes a listing of all terms and acronyms used in this report.

<u>Acronym or Term</u>	<u>Meaning</u>
ANG	Army National Guard
AVL	Automatic vehicle location
BRW	Three guys names, long since forgotten
CAD	Computer-aided dispatch
CCTV	Closed-circuit television
CDPD	Cellular digital packet data
CMS	Changeable message sign (see DMS)
CPR	Canadian Pacific Railway
CTR	Commuter Trip Reduction
CVISN	Commercial Vehicle Information Systems and Networks
CVO	Commercial vehicle operations
DMS	Dynamic message sign (e.g., new name for and same as variable, changeable message signs)
DSHS	Department of Social and Health Services
EDI	Electronic data interchange
EMS	Emergency Medical Service(s)
EOC	Emergency operations center
EOC	Emergency Operations Center
GIS	Graphical information system
GPS	Global positioning system
HAR	Highway advisory radio
HOV	High-occupancy vehicle
ITS	Intelligent Transportation Systems
KGY	Public access broadcast radio station (AM or FM? And at xxx or xx.xx)
LAN	Local-area network
MDT	Mobile data terminal(s)
MTP	Metropolitan Transportation Plan (for Puget Sound Region)
NWS	National Weather Service
POC	Point of contact
POTS	Plain old telephone service (or system)
PS&P	Puget Sound & Pacific RR
ROW	Right-of-way
RWIS	Road Weather Information System
SR	State route
Stakeholder	An ITS user, operator, deployers or beneficiary with a vested interest in the solution of transportation issues and challenges to benefit their operational or institutional needs, or that of their constituency
TCAD	Traffic and Collision Alert Device
TCTV	Thurston County TV (public access cable channel # ??)
TOC	Traffic operations center
TRAC	Transportation Research and Analysis Center

TRPC	Thurston Regional Planning Council
User Service	User services document what ITS should do functionally from the user's perspective
USFS	US Forest Service
WAN	Wide-area network
WIM	Weigh-in-motion
WSDOT	Washington State Department of Transportation
WSDOT ACCT	(WSDOT) Agency Council on Coordinated Transportation
WSP	Washington State Patrol
WTA	Washington Trucking Association

8.2 DEFINITIONS (OF ARCHITECTURE FLOWS)

The following table includes a listing of all architecture flows introduced in Section 7 with a brief description of their intended content.

As previously mentioned, additional analysis will be applied to the information in Table 7-2 in the process of developing the more exact architecture details. Thus, the results expressed in TM #2 shall take precedence over the initial top-level information results and definitions expressed herein.

Architecture Flow Name	Tailored Description (Initial) [<i>This architecture flow typically contains ...</i>]
1. Archive Information Coordination	Catalog data, meta data, published data, and other information exchanged between archives to support data synchronization and satisfy user data requests.
2. Broadcast Traveler Information	General broadcast information that contains roadway link travel times, incidents, advisories, transit services and a myriad of other useful traveler information.
3. Current Transportation Network Conditions	Current traffic information, road conditions, and camera images that can be used to locate and verify reported incidents, and plan and implement an appropriate response.
4. CVO Credentials Information	Response containing credentials information. Tax and credential fee information exchanged between cooperating commercial vehicle administration offices (e.g. regional or inter-state pre-clearance data).
5. CVO Screening Information/Clearance	Instructions to commercial vehicle managing and/or information systems indicating which vehicles are to be allowed to pass and which are out of service or have not been credentialed.
6. Demand Management Information	Network loading and situation information useful in determination of high-occupancy vehicle lane usage, value pricing (e.g., toll roads and bridges), alternative routing, travel restrictions, etc.
7. Demand Responsive Transit Information	Plan regarding overall demand responsive transit schedules and deployment.
8. Driver (En-Route) Information	General advisory and traffic control information provided to the driver while en-route.
9. Emergency Dispatch and Response Status	Request for additional emergency dispatch information (e.g., a suggested route) and provision of en-route status.
10. Emergency Notification and Acknowledgement	An emergency request for assistance originated by a traveler using an in-vehicle, public access, or personal device. Sufficient information is provided so that the recipient can determine the location of the emergency as a minimum. Additional information identifying the requestor and requesting device and the nature and severity of the emergency may also be provided (and required) by some systems.
11. Emergency Response Routing Information	Request for additional emergency dispatch information (e.g., a suggested route) and provision of en-route status.

Architecture Flow Name

Tailored Description (Initial) [*This architecture flow typically contains ...*]

12. Emergency Traffic Control Preemption Request/Status

Special request to preempt the current traffic control strategy in effect at one or more signalized intersections or highway segments. For example, this flow can request all signals to red-flash, request a progression of traffic control preemptions along an emergency vehicle route, or request another special traffic control plan.

13. Event Plans

Plans for major events possibly impacting traffic.

14. Highway-Rail Intersection (Crossing) Advisories

Notification of Highway-Rail Intersection equipment failure, intersection blockage, or other condition requiring attention, and maintenance activities at or near highway rail intersections.

15. Highway-Rail Intersection (Crossing) Status

Status of the highway-rail grade crossing equipment including both the current state or mode of operation and the current equipment condition.

16. Incident Report

Report of an identified incident including incident location, type, severity and other information necessary to initiate an appropriate incident response.

17. Incident Response Coordination

Incident response procedures, resource coordination, and current incident response status that are shared between allied regional response agencies to support a coordinated response to incidents. This flow also coordinates a positive hand off of responsibility for all or part of an incident response between agencies.

18. Incident Status Information

Information gathered at the incident site that more completely characterizes the incident and provides current incident response status.

19. Integrated Archive Data Products

Raw or processed data, meta data, data catalogs and other data products provided to a user system upon request. The response may also include any associated transaction information.

20. Interactive Traveler Information

Traveler information comprised of traffic status, advisories, incidents, payment information and many other travel-related data updates and confirmations. Visual or audio information (e.g., routes, messages, guidance) to the traveler.

21. Inter-modal Freight Operations Information

Inter-modal transshipment coordination; commercial vehicle driver and rail operations information and requests to/from a commercial vehicle/freight transshipment managing system.

22. Rail Schedules (e.g., Passenger, Freight)

Current rail system operations information indicating current routes, the level of service on each route, and the progress of individual trains along their routes for use in forecasting demand and estimating current transportation network performance. Specific passenger rail and fare schedule information including schedule adherence.

Architecture Flow Name	Tailored Description (Initial) [<i>This architecture flow typically contains ...</i>]
23. Roadway Construction, Closures, Restrictions	Information about roadway construction, closures, restrictions, hazards, etc. including their description, location, effect, duration, etc.
24. Route Plan (Emergency/Incident Response)	Tailored route provided by Emergency Management Center in response to a specific request from an emergency/incident response vehicle.
25. Traffic Control Coordination	Information transfers that enable remote monitoring and control of traffic management devices. This flow is intended to allow cooperative access to, and control of, field equipment during incidents and special events and during day-to-day operations. This flow also allows 24-hour centers to monitor and control assets of other centers during off-hours, allows system redundancies and fail-over capabilities to be established, and otherwise enables integrated traffic control strategies in a region.
26. Traffic Images	High fidelity, real-time traffic images suitable for surveillance monitoring by the operator, for use in machine vision applications, and for dissemination to travelers and the media.
27. Traffic Information	Current and forecasted traffic information, road and weather conditions, incident information, and pricing data. Either raw data, processed data, or some combination of both may be provided by this architecture flow.
28. Traffic Information Coordination	Traffic information exchanged between Traffic Management Centers (TMC). Normally would include incidents, congestion data, traffic data, signal timing plans, and real-time signal control information.
29. Traffic Information for Transit	Current and forecasted traffic information and incident information affecting transit operational routes.
30. Transit Coordinated Connection Information (e.g., Public, Private, Special Needs)	Specific transit and fare schedule information including schedule adherence. Instructions governing service availability, schedules, emergency response plans, transit personnel assignments, transit maintenance requirements, and other inputs that establish general system operating requirements and procedures.
31. Transit Emergency Notification	Data exchanged between centers dealing with a transit-related incident.
32. Transit Incident Information	Information on transit incidents that impact transit services for public dissemination.
33. Transit Parking (e.g., Park-and-Ride) Coordination	Request for coordinated parking lot space availability, fare payment and parking lot price data.

<u>Architecture Flow Name</u>	<u>Tailored Description (Initial)</u> [<i>This architecture flow typically contains ...</i>]
34. Transit Schedule and Fares	Specific transit and fare schedule information including schedule adherence.
35. Transit Traffic Signal Control Priority Request/Status	Request for signal priority at one or more intersections along a particular route.
36. Transit Traveler Information	Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, and general transit service information.
37. Transit Vehicle Locations	Current transit vehicle location and related operational conditions data provided by a transit vehicle.
38. Transit Vehicle Schedule Performance	Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.
39. Weather Information	Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).

Appendix A

Interviews & Start-Up Materials

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Identification of Initial Interviews and Start-Up Sources:

The following table enumerates the sources and variety of interview comments and start-up materials. These materials are included following the table, in the same order as listed in the table.

Organization/Functional Area	Name(s)	Date Interviewed
WSDOT Olympic Region – Freeway Operations	John Nisbitt, Jim Mitchell	2/13/2001
Thurston County Roads & Transportation Services	Dick Weston	3/29/2001 (by phone)
WSDOT ITS	Bill Legg, Ed McCormack	2/12/2001
Ft. Lewis, Emergency Operations Center – Operations Officer	Don Edwards	2/13/2001
Puget Sound & Pacific Railroad	Tom Foster	3/29/2001 (by phone)
City of Tumwater	Doug Johnston	3/20/2001 (by phone)
Port of Olympia	Nick Handy	3/20/2001 (by phone)
WSDOT Public Transportation Office, mobility Planning Administration	Gordon Kirkemo	2/7/2001 (by phone)
WSDOT ACCT	Don Chartock	2/8/2001 (by phone)
City of Yelm	Cathie Carlson	3/21/2001 (by phone)
Washington Trucking Association	Jim Tutton	4/9/2001 (by phone)
Intercity Transit – Planning & Maintenance	(unidentified respondents)	Self-Completed questionnaire
Grays Harbor Transportation Authority	Dave Rostedt	Self-Completed questionnaire
Sound Transit -- Research & Technology Management	Nick Roach	
Twin Transit	Patty Alvord	
Pierce Transit	Keith Messner	
King County Department of Transportation – Metro Transit Division, Management Information & Transit Technology Section	Dan Overgaard	
City of Olympia	Dave Riker, Subir Mukerjee	Start-Up Information
City of Lacey	Dennis Ritter, Martin Hoppe	Start-Up Information
City of Tumwater	Jay Eaton, Doug Johnston	Start-Up Information
City of Yelm	Shelly Badger, Cathie Carlson	Start-Up Information
Port of Olympia	Nick Handy, Andrea Fontenot	Start-Up Information
Thurston County Roads & Transportation Services	Lester Olson, Les Olsen	Start-Up Information
Thurston Geodata Center	Andrew Kinney	Start-Up Information
Intercity Transit	George Patton, Jim Merrill	Start-Up Information
Thurston County 911	Jim Quackenbush	Start-Up Information
Tacoma Traffic Management Center – WSDOT Olympic Region Operations	Jim Mitchell	Start-Up Information
Washington State Patrol	Dan Parson, John Bruun	Start-Up Information

Thurston Project – Interview with John Nisbitt & Jim Mitchell of WSDOT Olympic Region

Held in Tacoma at TOC on February 13, 2001 11:00am

Preamble: John is the WSDOT Olympic Region Traffic Engineer; Jim is the WSDOT Olympic Region Freeway Operations Manager.

Q1: Can you provide a brief summary of the current transportation services that your organization provides?

This is the WSDOT Olympic Region TOC. Our region includes the counties of Pierce, Thurston, Mason, Kitsap, Clallam, Jefferson and Grays Harbor. It is adjacent to NW Region to the north, SW Region to the south and So Central Region to the east.

Q1a: What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(John:) Our domain includes the state roads and interstate interchanges in Thurston county, those would be: I-5, US 101 and 12, and SR 8, 510, 507 and 121. [From a map read: there are ~13 interchanges on I-5 and ~6 on US 101 in Thurston county.] We build and maintain these roads and the ITS equipment deployed along those right-of-ways. We do all the traffic control, disseminate information to the public and to the media. We own and operate the en-route driver info stuff like DMS and HAR. All these roads are toll-free. We send or make available the CCTV images to the public and the TV media. We send our traffic data and CCTV images to NW Region for inclusion on the state web site (http://www.smarttrek.org/map_tacoma.html) but it covers only I-5 and 16 Tacoma/Pierce county at this point.

(Jim:) We do the “freeway operations” and are the communications center for the Olympic Region—we receive data and information from all sources and disseminate it to tell people what’s happening on the state routes, adjacent county and city roads, and with the USCG. We don’t do dispatch from here, that’s WSP. We schedule and tell people about the Hood Canal and Tacoma bridges. (Like John said) we do the signal operations on the state roads and where they interface to city/county roads. There are shared operation of intersections/interchanges at US 101 @ Black Lake (Olympia) and Cooper-Crosby @ Martin Way (Lacey).

[At this point Jim Mitchell was called away to deal with a report of “criminal activity” near I-5 in Tacoma. This was the suspected dynamite in a storage shed near the interstate. WSP was planning to close I-5 in the early afternoon for the proposed EOD action. The interview continued with John alone.]

These “shared” operations are WSDOT owned, city operated and timed.

(John:) When I say “traffic operations” I mean signal operations, design of ITS, and operation and maintenance of it all. Our plans for future ITS are very funding (\$) dependent. The two top items on our list are: I-5 @ 101 and 101 @ Black Lake. We want to extend our coverage with CCTV and we have loops on I-5 that bring data to the transportation data office [these are traffic counts, non-real time; Jan Meyer (she) is the point of contact]. Could these traffic counts be made real-time?—possibly.

Our basic need is to have roadway condition information. In most cases that means “traffic”.

We have a signal shop in Tumwater. Our communications is by copper wire/twisted pair from the on-street master to the shop; we also use plain old telephone service (POTS) dial-up.

Commercial vehicles cause a few moments of congestion, the off-peak isn't bad at all. The peaks happen at (generally) 7-8:00am and 4:30-5:30pm; Olympia is slightly wider at 6:30-8:30am and 4-6:00pm.

Incident Management is done by Washington State Patrol (WSP)—by law, they have the “On-Scene Command” responsibility and authority. Like NW Region, we use the WSP Computer-Aided Dispatch (CAD) system to acquire info about incidents on the state roads. We have a feed from the WSP CAD into the Tacoma TMC. The WSP district in Olympia matches Olympic Region pretty well.

We are in the process of defining pre-planned alternate routes and future decisions about “E911” calls – they now go to WSP.

So, we have CCTV and two HAR covering I-5 (from approximately 93rd N in Tacoma and I-5 @ 101 out to Evergreen Park Drive in Olympia). We want to have DMS in Thurston and have plans for that in less than 10 years; at points on I-5 and 101.

Q2: What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

We have implemented CCTV on I-5 and 16; DMS and HAR at key locations in the region. We have fixed B&W CCTV traffic detector stations (4-5) on I-5 in Tacoma.

We have this facility, the WSDOT Olympic Region Center our traffic management center or system (aka: Tacoma Center, TOC).

Our first increment of ITS was for Tacoma, the Narrows Bridge and ~Pierce County; Thurston is in the near-term or intermediate term and includes CCTV coverage.

Q3: How does your organization interact with other organizations in exercising its transportation responsibilities?

We have WSDOT wide-area network (WAN) and radio communications with WSDOT regions, and we use the phone.

Q3a: What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

We provide our traffic data to WSDOT for the separate “Olympic Region” flow map. Right now it just shows Tacoma because we don't have any data for other roadways (yet). We get weather and RWIS data. The construction and maintenance info is discussed and disseminated over DOT radio. Maintenance (planned/unplanned) for Olympia is out of the shed (at Mottman?). Snow-Ice planning and removal also.

We provide info to the external media through our web page (construction activity “spot”), press releases (from PIO DWH; email) and we do a weekly construction report. We have a “hot line” that folks can call for info. We have no “demand management” (e.g., tolls or ramp metering) now but ramp metering is on the agenda for +10 years. HOV is planned in Pierce county but not in Thurston.

Q3b: What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

We get incidents from the WSP CAD system link. We get or create information from our own maintenance and (planned) construction activities. We disseminate this roadway situation info to WSP,

our own incident response teams (IRT) maintenance, the public and media. For maintenance and construction, we provide to local jurisdictions (e.g., Olympia, Lacey) so they can consider it for possible adjustments to their signal timing.

WSP gives us duration estimates and then we assess the availability of alternate routes. This includes detours through Ft Lewis [*this may be important for discussions with Ft Lewis folks.*]

For railroads, we do have at grade crossings on county roads. The trains operate at 60 mph (at crossings?) and 79 mph (elsewhere?). [*from the WSDOT ITS guys—the high-speed trains Seattle->Eugene are owned by DOT (WSDOT & ODOT?) and the goal is to increase the speeds.*]

Q3c: What aspects of your information sharing process work the best? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

The WSP coverage of Pierce and Thurston is available to us by using a scanner, the WSP CAD system interface and the telephone. The WSP is located in the same building as the Olympic Region/Tacoma TOC. The other WSP detachment is in Bremerton and provides the same info to us for the NW extremes of our region

Q3d: Do you see any barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?

Regional communications infrastructure might be our biggest challenge (see 3e below).

Q3e: How do you transfer and share the information? Using Internet, over publicly-owned or leased dedicated wires or fiber, plain-old-telephone-service, email, fax, modem, vendor's system, etc.?

Communications right now are point-to-point microwave using shared wire/fiber resources with the local Fire Department(s). If (or when) we get the "Light Lanes" project, that will greatly enhance our communications along the I-5 corridor (~42 fibers) in Pierce and Thurston.

Q4: What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?

We have/are working on a "mobility plan" that addresses HOV, safety improvement and preservation. Our 20-year plan for construction doesn't include any major work on I-5.

Q4a: To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?

The Narrows Bridge is a point of interest and of course, Tacoma (not Thurston County). In Thurston, I-5 @ 101, I-5 City Center (Exit 105) and Black Lake are important interchanges to us.

Our biggest challenge is incident management (e.g., detect, manage) and our worst location is US 101 @ SR 8. Incident management is our biggest opportunity. We should have more/better CCTV, flow map data and better detection of incidents. This helps us with detection and (subsequently) IRT or EMS vehicle response.

The incident management detours in Olympia and Lacey are pre-planned. We have signal timing adjustments that are part of our regional standard procedures.

Q4b: What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e., opportunities to coordinate with regional plans, possible funding requests, etc.)

Olympia should do CCTV at Black Lake Blvd and other interchange areas. {POC: Shuming Yan?}

Q4c: What role should the TRPC play in facilitation of this process, in helping you overcome your issues and exploiting your opportunities?

[from another source] Jim attends their council meetings and is actively engaged as the WSDOT liaison to their planning. That works well.

Q6: Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?

Random thoughts:

The Army National Guard (ANG) has an Emergency Operations Center (EOC) at Camp Murray, the state has a back-up EOC at Tumwater.

Q7: Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role? [Contact information?]

You should talk to Transportation Data Office (Jan Meyer); WSP (Lt John Bruun);

[I mentioned I was going to Ft Lewis in the afternoon ...] the Army National Guard (BG Barton/Barlow); Ft Lewis Base Military Police (LtCol Frells); also Ft Lewis Public Works.

Thurston Project – Interview with Dick Weston of Thurston County

Held by phone on March 29, 2001 1:00pm

Preamble: Dick is the manager of two divisions at Thurston County Roads & Transportation Services

Q1: Can you provide a brief summary of the current transportation services that your organization provides?

The organization's overall responsibility is the county road system. Specific areas of responsibility include capital road improvement projects, county road maintenance, transportation issues, new development review, construction inspection, surveying, GIS program, engineering, surveying, and fleet services.

Q1a: What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

I manage road maintenance and fleet services. So I'm responsible for all county road maintenance, and for the purchase and maintenance of our fleet including construction equipment. The fleet includes vehicles like: construction equipment, plows, trucks, supervisor P/U and sedans, and the Sheriff's vehicles.

Q2: What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

In traffic engineering we use traffic counters and such, we have a few GPS units, our surveying division has state of the art equipment and technology as does our GIS division. These are not deployed roadside technology but things we use in our work.

We have portable traffic counters but no permanent installations. We have about ~6 signalized intersections which are maintained by contract to outside services. [Do these have (transit) signal priority/(emergency vehicle) preemption capability?] Don't know.

We have a weather information computer (National Weather Service or vendor?) that we use for weather-related planning. If there are any road weather info systems (RWIS) in the county, we don't get that data.

We have portable dynamic message signs (DMS) that we use on site for road construction and maintenance. [Assume—dial-up capable?] No.

We'd like to have vehicle location and a capability to do "measure of quantity and output". This latter capability applies to mowing, snow plows and dispersal of chemicals/treatments. In general, we'd like to have vehicle location capability in our supervisor's P/U and other vehicles—where it makes sense to do it.

We have recently installed maintenance management software that we are debugging. It helps us with fleet management but isn't, and maybe can't be, tied into any present or future vehicle location management.

The county to our north (Pierce) is in the process of implementing GPS vehicle tracking—we'd like to head that direction also.

We have an emergency management plan and we have an EOC (on Pacific Avenue; in the old PG&E Bldg). That is also where we have our “911 Center”.

We have some flood detection systems deployed (e.g., Nisqually Valley/River). When they alarm, the alarm goes off locally (where the sensor is located); I’m not sure if it also goes off in the EOC or 911 center(?). Not really sure how this system works.

[I asked about others like: CCTV, HAR, DMS, ...] There might be a few places for CCTV, but privacy issues would need to be resolved.

We also are considering some low-tech ice warning systems. These are the kind that turn blue when the conditions are right for ice.

Q3: How does your organization interact with others in exercising its transportation responsibilities?

Very well. We have good working relationships with all the cities (e.g., Olympia, Lacey, Tumwater, Yelm, Tenino, Rainier, Bucoda, Rochester and Grand Mound). We have good contacts with the WSDOT and Ft. Lewis (they are a major “land-holder” in the county. We meet regularly with the counties west of the Cascades to discuss issues of importance (e.g., endangered species, road construction and maintenance particularly where these roads cross county lines, etc.).

Q3a: What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

We share info about maintenance work, construction, salaries (huh?). We share all our major projects, annual plans, capital construction project info with our cities and neighbor counties. Our interagency relationships are very good—we help if cities or adjacent counties need help. We sometimes do “shared work” where we ask a neighbor county to do some work on their border with us, or a roadway that crosses the county line; then we return the favor.

[What about incidents?] We have a road deputy who is our primary accident responder for fatal and serious accidents. He is trained and does the accident investigations; we take care of the flagging or other traffic control measures as needed. If we have a planned or unplanned “significant event”, we have a standard “call list”. We notify all our partners by fax, email (and when time allows) plain-old mail. We include emergency responders on these call lists and (obviously) use the phone or faster means to disseminate the situation.

Q3b: What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

Same as in 3a above—we share back all the same information and data. I’d amplify that and say that we hold regular contractor and agency meetings to discuss and share info about major resurfacing, construction, etc.

We don’t get data from the state—we know they have sensors (traffic counters) on I-5, but we don’t much need that data.

When we get a call to 911 that involves road maintenance emergencies, we respond. We use our county radios while we’re out in the field.

Q3c: What aspects of your information sharing process work the best? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

They all work pretty well. No obvious fixes come to mind.

Q3d: Do you see any barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?

Our biggest challenge is the human one—of being able to get in contact with someone when you need to. We're all connected and can communicate using the phone and email.

Speaking of the phone, that recent earthquake was a major challenge—the phone system was jammed for calls from outside the county coming in. It took me 6-7 hours to get through from where I was outside Thurston.

[Do you have county radios?] Yes, we have radios and they work very well. We also use cell phones. There are a few dead spots in the county for both systems but not a major problem.

Q3e: How do you transfer and share the information? Using Internet, over publicly-owned or leased dedicated wires or fiber, plain-old-telephone-service, email, fax, modem, vendor's system, etc.?

We use the Internet, email, fax and phone (POTS & cell). We don't have any dedicated wire or fiber that we use to share data or info.

[I mentioned the "Light Lanes" project potential] ... enthused about that if it happens.

Q4: What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?

I can think of nothing that we could do to improve—already very good sharing and interactions. [I asked about Ft. Lewis:] We actually never asked them for help (in my 12 years on this job).

Q4a: To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?

(same as 4) refer back to the vehicle location system ideas.

Q4b: What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)

I can't say, our County Engineer (Dale Rancour) and County Commissioner attend the TRPC meetings regularly—they would have a better idea.

Q4c: What role should the TRPC play in facilitation of this process, in helping you overcome your issues and exploiting your opportunities?

N/A

Q6: Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?

Random thoughts:

My biggie wish list would be:

GPS in our vehicles where it makes sense,

Vehicle location and management (communications & software?)

GPS-based inventory (in a GIS?)

We are completing road system inventory using GPS right now. We are video taping our roads with integrated GPS data. We're filming our arterials, collectors, signs, drainage, etc. We will put that "on-line" for internal use and maybe external use (on a CD?) later.

Our Supervisor vehicles should have some kind of computers (e.g., mobile data terminals)

Q7: Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role? [Contact information?]

Leslie Olsen -- County Surveyor,

Dale Rancour -- County Engineer, or

Andrew Kinney -- GIS manager at (360) 754-4458.

Thurston Project – Interview with Bill Legg and Ed McCormack of WSDOT

Held in Seattle at the Transportation Research and Analysis Center (TRAC) on February 12, 2001 9:00am

Preamble: Both Bill and Ed are located at the WSDOT ITS Program Office in Seattle adjacent to the University of Washington campus. Bill is the Asst ITS Pgm Mgr for WSDOT (Pete Briglia is the Pgm Mgr). Ed is the Sr Res Engr for WSDOT TRAC at UW.

Q1: Can you provide a brief summary of the current transportation services that your organization provides?

[my words] The WSDOT ITS office is not an operational entity. They facilitate, guide and lead the development of ITS programs and projects to benefit the WSDOT regions and the included/adjacent jurisdictions. In this case, the WSDOT Region of interest would be the Olympic Region ~centered in Tacoma.

Q1a: What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

Bill: the WSDOT ITS programs that I manage cover the Olympic Region which includes Thurston County. Our thoughts about traffic in Olympic region are centered on Tacoma and managed from the Tacoma TOC (Jim Mitchell is the manager there). We provide/channel the \$ for ITS in that region. We want to expand the span of the Tacoma TOC to include Olympia (a goal). Pete (Briglia) and I stay on top of all the regional, state and local ITS Plans/Architectures, needs & wants so we can always be ready to propose projects for earmark opportunities and within our state budgets.

Ed: I'm involved in safety studies, ITS freight and rural applications that certainly apply in Olympia and the surrounding rural areas of Thurston County.

Operationally we are not actively engaged but we facilitate and assist the regions with ideas and funding for their ITS efforts.

An important aspect of ITS in that region is the Incident Management program. Those Incident Response Teams (IRT) and their equipment are a WSDOT resource that helps that region -- there is one IRT Team/Vehicle assigned to Olympic region (DC: from Smart Trek--I thought there were two?).

Ed is working ITS ideas in Whatcom county which might provide ideas and leverage ITS in Thurston (e.g., they are similar largely rural counties with I-5 corridor and ~one large metro area).

The Tacoma Center (TOC) has a "plan" for growth that will include the state roads and interstate in Thurston. Talk to Jim Mitchell at the TOC; he is also the POC for coordination with TPRC (yes; and Jim will be ~interviewed on 2/13/01).

The major roads of concern to WSDOT in Thurston are: I-5, 101, and others (the "others" will be identified by talking to the folks at the Tacoma TOC).

Q2: What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

Again, were not an operational entity but the answer would be exactly the technologies deployed by the Tacoma TOC for the Olympic region. Those would cover the state roads in Thurston. They aren't there yet but, as mentioned above, there are plans. The Tacoma TOC is on the same path as Seattle having built a nucleus TOC, they are now working on the integration of regional operations. They want devices on I-5 through Olympia, Tacoma and SR 101 on-road stuff connected to the TOC.

There is only incidental commercial vehicle operations (CVO) stuff out there in that region.

Now a list of raw comments in response to the list of possible technologies:

- Loops are too far apart to be used for traffic congestion and speeds (Tacoma?)
- (there are/need) detectors related to arterial interfaces with state/I-5 roads
- ramp metering—Tacoma has one; Olympia--?
- VMS on I-5, 101 in Thurston? Don't know ask Jim Mitchell
- Signals on SR 507, 12, 510, 101, and I-5 are WSDOT
- There is signal preemption for emergency vehicles only; WSDOT use Opticom—standard is to use “optical” systems only; systems have 2-4 preemption levels
- Communications are/will be a challenge; Thurston has none ; Tacoma uses microwave backbone and plans to continue that into Olympia; if we get the “Light Lanes” funding, many of these challenges will be solved
- HARS & VMS—there are several; these are dial-up so not a major telecomms challenge (locations from Tacoma TOC)
- There is (or will be?) a weigh station in Thurston and it is scheduled to be weigh-in-motion (WIM)
- (I asked about CVO related technologies—was there any CV or container tagging? Ports?) there are ~12M containers moving through the Port of Tacoma; not sure for Port of Olympia.
- CVO “behaviors” are not traffic, therefore not high on the screen; talk to Tim Ericson in Toby's shop—he's the CVO guy; safety and on-board monitoring are a Washington State Patrol (WSP) responsibility
- WSP is “by law” the on-scene commander for any incident on state roads; the 911 call goes to WSP and they respond; policy is to request IRT from WSDOT only when needed for longer duration traffic control measures (i.e., if the blockage affects one or more lanes for more than one hour)
- The IRT in Olympic region is more pro-active than Tacoma, Seattle in their initial training (of the WSP?)
- Thurston has no call boxes
- The Olympic Region has pre-planned diversion routes—signed, agreed w/cities and county
- Rural Weather Info Sys (RWIS) – Bill Brown @ TRAC is the guy; “R-Weather” is the catch phrase and web site that shows current conditions, forecast, road surface temp—this is out of UW; the NW weather consortium includes NWS, military, USFS, ... ~400 stations are integrated with software to 2KM resolution; goal is 1KM resolution
- The WSDOT vision and goal is: urban -> rural -> statewide
- For E911, how to advise the jurisdictions of their responsibility ... ?

Q3: How does your organization interact with others in exercising its transportation responsibilities?

WSDOT and the MPOs are engaged; the MPO has to be part of the planning process; also the cities, counties.

The lead for this in WSDOT Olympic region is Jim Mitchell; he attends the meetings and coordinates with the TRPC.

Also key is the Office of Urban Mobility talking to the MPOs.

We have a very cooperative environment in WSDOT and with all the regions and jurisdictions.

[What about rail?] Need to talk to an AMTRAK contact. The train that runs to Eugene is a WSDOT-owned train. *The "grain train"?* The focus is on passengers and how to increase the speeds of trains in the I-5 corridor. There are several at-grade crossings for the high-speed rail corridor [get list from?].

There are no Washington State Ferries (WSF) operating in Thurston or Olympia.

Q3a: What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

N/A?

Q3b: What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

N/A?

Q3c: What aspects of your information sharing process work the best? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

Mostly the results of studies, for example: restricting trucks to right lanes only—no better, no worse effect on traffic flows or safety. But, the apparent volume of trucks is an issue that never goes away—(est.) the volume of trucks is <=30% that of other vehicles.

Port of Olympia?

Classification counters Lacey & Tumwater [already there or planned?]

Q3d: Do you see any barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?

The perception that info sharing is giving up control – maybe. The accident reporting system is a mess (contractor was hired in '96 ...?) [*we probably don't want to quote this outside our team.*]

Q3e: How do you transfer and share the information? Using Internet, over publicly-owned or leased dedicated wires or fiber, plain-old-telephone-service, email, fax, modem, vendor's system, etc.?

??

Q4: What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?

N/A?

Q4a: To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?

N/A?

Q4b: What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)

We prepare an earmark project list every year; it includes 12-18 statewide projects and TRPC needs to get theirs on that list. Of course, there is some screening and selection at the WSDOT level, but main point is the projects need to get on the list to be considered. The TRPC ideas would feed to WSDOT through the Olympic Region (Jim Mitchell) and we have a good relationship there.

Q4c: What role should the TRPC play in facilitation of this process, in helping you overcome your issues and exploiting your opportunities?

(see 4b) The TRPC needs to develop their list of projects and make sure they get on our list to be considered. We have Jim attending their meetings so that isn't a big deal. We work well with all the MPOs.

Q6: Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?

The regions (Olympic in this case) know what they need to do, and how and whom to do it with ... \$ is (as always) the major challenge.

Random thoughts:

Tacoma TOC and Olympia airport? SEATAC – Olympia?

Vision: regional commuter airport which would be Port of Olympia

Travel demand modeling: emissions, cold starts, need data (from ITS devices)

Q7: Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role? [Contact information?]

Contact info for Tim Erickson (WSDOT CVO guy)—(360) 705-7343 – he can discuss CVO, WIM, commercial vehicle information systems and networks (CVISN), freight mobility items

[I'm going to interview WTA and Ft Lewis—what do you think is important or what are they likely to mention?]

WTA: he/they like technology; congestion notification system(?) (Port of Tacoma?)

Ft Lewis: accessing the base (for alternate routes during I-5 problem?); lock-downs?

Thurston Project – Interview with Don Edwards of Ft. Lewis Emergency Operations Center

Held at Ft. Lewis, in the EOC on February 13, 2001 2:00pm

Preamble: Don is the Emergency Operations Officer for Ft. Lewis, WA. His office is located adjacent to/in the Ft. Lewis EOC.

Q1: Can you provide a brief summary of the current transportation services that your organization provides?

N/A?

Q1a: What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

We cover installation operations in emergency conditions – fire, police, hazmat. We are a federal agency and provide military support to civil authorities (MSCA) when requested (the issue is funding). We cover declared emergencies by the Governor with federal OK.

The exceptions are:

We are the state EOD resource for the western US (the HQ EOD BN can amplify)

We provide MAST (military assistance to safety & traffic)

Q2: What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

N/A?

Q3: How does your organization interact with other organizations in exercising its transportation responsibilities?

[see preamble]

We also provide assistance to other federal agencies such as air rescue (e.g., USFS rescues from Mt. Ranier). The issue is that we need the funding OK before we can provide aid. This comes from FORSCOM (Atlanta, GA) to Ft. Lewis—it isn't necessarily a red tape situation, often a quick military message or phone call gets it done.

The Corps assets are spread around the country: Ft. Lewis, Ft. Carson (CO) and Ft. Hood (TX).

We always practice a “good neighbor policy” in that we'll provide assistance outside the federal properties in cases where no action (by us) would result in (1) loss of life, or (2) loss of property. We also have a mutual aid agreement with local municipalities for fire and medical (Madigan Army Hospital is a regional Trauma Center).

[What about E911?] Our contact for that is DOIM (?) LtCol Gregory. Ron Trow—Dir, Joint Transportation has Emergency Command & Control Vehicles that are used by the Military Police. Public Works has one too [Col Conte]. There are also incident control vehicles used for hazmat, major fires, etc. These vehicles can monitor radio (radio trunking system; repeater on Davis Hill) for all of Ft. Lewis.

There is local and wide-area transit service to/from the base provided by Greyhound & Trailways, and the Ft. Lewis base shuttle.

Our little "community" of Madigan, Main Post and DuPont is a city of ~50K people. The Commander has a briefing (weekly?) about the situation.

The Washington State EOC is at Camp Murray and is well connected (communications).

The Training Support Division [J. B. Layne] encourages/promotes a "Ride Share" program.

Road conditions on base and in the region are very important to us. We use that info, as well as current and forecasted weather to make our determination of whether we should enter an "operational curtailment". This is a state of reduced operational tempo scaled to the "threat" based on predominantly the weather. We examine roads conditions and call them green-amber-red. We use the weather forecast to determine if the situation is improving or getting worse and advise the Commander. The Commander chooses the "Code" level of the op curtailment. We use an automatic phone system (14 phones) to disseminate the Commander's decision.

We identify our personnel as "Critical", "Mission Essential" and ... other? If a "Code 1", critical and essential report; if "Code 2" only critical report. The general rules are:

If at home, stay home,
If at work, phased release

These kinds of decisions on post could significantly affect the local traffic situation in and around the base.

Q3a: What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

N/A?

Q3b: What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(as above) Road conditions on base and off base in the region are very important to us. We use that info, as well as current and forecasted weather to make our determination of whether we should enter an "operational curtailment" and then phased release of personnel.

Q3c: What aspects of your information sharing process work the best? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

N/A?

Q3d: Do you see any barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?

N/A?

Q3e: How do you transfer and share the information? Using Internet, over publicly-owned or leased dedicated wires or fiber, plain-old-telephone-service, email, fax, modem, vendor's system, etc.?

N/A?

Q4: What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?

N/A?

Q4a: To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?

N/A?

Q4b: What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)

(see below)

Q4c: What role should the TRPC play in facilitation of this process, in helping you overcome your issues and exploiting your opportunities?

I recall attending a few of their meetings. I think that our Emergency Plans guys should attend regularly; I think the operations guys go when they can. The Emergency Plans guy is Jim Kane and his assistant is Capt. Mike Carrey.

Q6: Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?

Random thoughts:

There is going to be an anti-terrorism exercise in April involving the FBI, FEMA, EOC and the ANG.

Q7: Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role? [Contact information?]

The POCs I mentioned are [all are at (253) 967-]:

Ron Trow [Dir, Joint Transportation]	-9641
Col Conte [Public Works]	-3191
J. B. Layne [Training Spt Div.]	-0477
LtCol Gregory [DOIM?]	-4524
LtCol Frells [Mil Police?]	-3121
Major Baker [also MPs]	-5978

The Army National Guard is MG Barlow at (253) 512-8201. He is the Adjutant General of Washington.

Thurston Project – Interview with Tom Foster of Puget Sound & Pacific Railroad

Held by phone on March 29, 2001 4:15pm

Preamble: Tom is the Vice President & General Manager of the PS&P RR [I started by asking Tom to consider interactions between the PSAP operations and vehicles at grade crossings, PSAP access to the Port of Olympia, or any other transshipment facilities, etc.]

Q1: Can you provide a brief summary of the current transportation services that your organization provides?

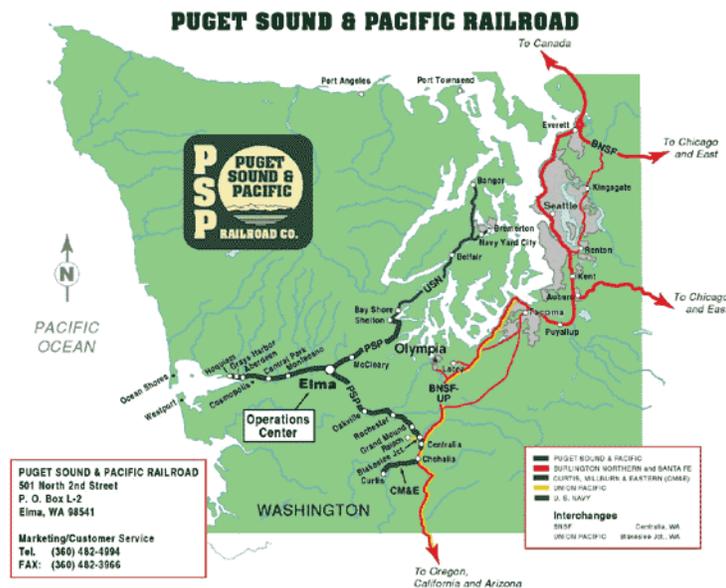
[From their web site ...] The Puget Sound & Pacific Railroad (PSAP) serves the timber producing, industrial and agricultural areas of Western Washington. The 150-mile railroad provides safe, reliable rail service for 11,000 carloads annually. Based at Elma, Washington, PSAP is linked to the national rail network via connections to the Burlington Northern and Santa Fe Railway (BNSF) at Centralia, Washington and the Union Pacific Railroad (UP) at Blakeslee Jct., WA.

The railroad has prospered by responding to shipper needs and expanding niche markets. PSAP transports lumber, plywood, pulp, chemicals, propane, fertilizers, feed grain, logs, aluminum, scrap and other metal products, as well as special components for the U.S. Navy.

Q1a: What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

I'm the GM, We operate the railroad. We pickup and deliver to our customers on our line six days a week. Five days a week to the Grays Harbor, Shelton and Bremerton (Navy). [see map]

We operate in Mason, Lewis, Grays Harbor and Kitsap primarily – little in Thurston. We do not serve the Port of Olympia (our partner Class 1 companies do).



Q2: What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

We use radios, cell phones and there are several actuated grade crossings on our line.

[Any issues or technology use with long trains, roadway blockage, etc.?] We operate trains of 40-60 cars and observe the "10-minute rule" (we don't block a crossing for more than 10 minutes, almost never).

Q3: How does your organization interact with others in exercising its transportation responsibilities?

We interact continuously with the Washington Utilities and Transportation Group (or Commission?) – it's the UTC. The discussions with them apply to the actuated crossings, and programs for enhancement and upgrade.

We also stay involved with WSDOT for upgrading railroads, services and the Rail Assistance Program (?). Also with Federal Railway Agency (FRA). [How about counties, cities?] We stay in contact at the county level a little.

[From PS&P web site:] The Puget Sound & Pacific Railroad actively works with the Ports of Grays Harbor, Shelton, Bremerton, Centralia and Chehalis, local communities and business development organizations to attract new industry along the rail line. PSAP has a wide variety of rail-served industrial sites available at various points on the railroad.

PSAP began rail service to the Curtis Industrial Area at Curtis, Washington on October 1, 1999. This industrial area is located eight miles from Interstate 5, halfway between Seattle, Washington and Portland, Oregon. These green-field sites offer 275 acres of land and direct access to an extensive railroad yard already in place. The land is owned by Weyerhaeuser and Port of Chehalis and is available for immediate development.

Q3a: What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

[Do you have cases where you provide advance warning of train movement to cities, counties, etc.?] No, but we do that kind of thing with the trans-load facilities for chemicals. We (or they) send a fax to schedule pickup or delivery.

We also do reporting to agencies on our operating hours of service and any injuries, but not real-time data sharing. We do electronic data interchange (EDI) with our partner railroads to give/get information about loads and empties—but not with agencies. This EDI uses the “rail car management software” – which the rail industry uses.

Q3b: What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(The same EDI from above.) [Weather? Traffic?] If I need to look at weather, I go to the MSN.com site. [I mentioned that the state has/will have RWIS in these same counties, would an integrated regional weather picture be useful?] ... yes that would be of interest.

Q3c: What aspects of your information sharing process work the best? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

Our sharing of information works well. One area where I'd like to improve is to be able to be more involved in the policy and rule-making (e.g., at UTC, WSDOT, FRA?). For good reasons—how it fits, what are the impacts, what's good for the rail industry, the agencies, and the general public.

Q3d: Do you see any barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?

I see no barriers to info sharing. I/we (the rail industry) are not the least bit reticent in discussion of our issues, thoughts about improvements that make things better for agencies and “business.” To the UTC, ...

Q3e: How do you transfer and share the information? Using Internet, over publicly-owned or leased dedicated wires or fiber, plain-old-telephone-service, email, fax, modem, vendor's system, etc.?

We use the Internet, email, fax and phone (plain old telephone service (POTS) & cell). We have a web site. We do the EDI mentioned above. We don't own or operate any of our own dedicated "wiring" (except our radios and phones).

Q4: What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?

No obvious changes in mind. As mentioned above, I'd like to be involved more on the front-end of policy and rule-making so we could participate in the development discussions, better understand, offer alternatives, etc.

Q4a: To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?

N/A

Q4b: What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)

[Are they (TRPC) involved in growth planning? – Yes, I believe so, ...] Then the TRPC should take a close look at the Port of Olympia, to improve access for "Class 1 RRs" and other modes. We could use more track and switching on a timely basis.

[Side comment: the region needs to decide if it wants to be a "boutique region" or diversify and be much more.]

Q4c: What role should the TRPC play in facilitation of this process, in helping you overcome your issues and exploiting your opportunities?

TRPC should facilitate the discussion between the Port of Olympia, RRs, trans-load truckers, etc. – to see where they want to go with Transportation services and ideas.

Q6: Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?

N/A

Q7: Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role? [Contact information?]

Nick Handy – Port of Olympia
Miller Brewing, Pepsi Distributors, etc.
Kari Quivstad, Director of Marketing for Port of Olympia

Doug Johnston, City of Tumwater**1. Can you provide a brief summary of the current transportation services that your organization provides?**

(For each type of agency, we need a list of items that we can use to prompt them here. In the case of a transit operator, this list would include: types of service provided (e.g., fixed-route, demand-responsive), contracted out versus operate themselves, number of vehicles and types, service area, etc.).

City of Tumwater

Population 15k of 70k person area

US 101 and I-5 bypass and split city

Transportation network:

main arterial is Capitol Blvd.

minor arterials

Little Rock (old highway 99)

Our eastern Rd. is Cleveland Yelm Hiway

there are other minor arterials

There is a RR line through town

Supports Miller brewery @ Enderson Blvd. The volume is small, but we're doing a street project to improve sight distance.

R.R. goes to West end of town at industrial park at Motman Rd. This is not a crucial RR line.

a. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

He is one of the city engineers and deals with transportation related issues

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology? [Shopping list of technologies]

They struggling about how to apply to technology here, but are at a loss.

The only thing they can think of in the ITS area is connecting the light signals.

Having cameras at intersections does not have a big benefit for them, given the cost.

Finding staff to be in charge of the ITS would be difficult because city staffs are so small.

Not saying they don't want it – they don't know how it applies. So, the education component of the architecture process would be most useful to us.

Because Tumwater is at a juncture with 101 and I-5, when I-5 shuts down, the system fails because there aren't any alternate parallel highways. CMS would be helpful to guide people off the highway around the accident. Perhaps WSDOT could have monitors on I-5 and designated routes for bypasses through Tumwater when they need to divert traffic off of I-5. WSDOT could monitor both the highway and the primary and the secondary alternate routes. This would be useful to users of the highway. Since I-5 traffic is WSDOT's responsibility, WSDOT ideally should be in charge of the ITS for traffic diverted off of I-5 (and they should be in charge of managing that surge of traffic on Tumwater's road network).

There are benefits from plugging into a WSDOT system that is primary run by them (staffing is a big issue.) But plugging into such a WSDOT system is not the perfect situation for Tumwater.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

They have pretty informal structures already. The relationships between the cities and the county are good and cooperative. Jurisdictions have worked well lately trying to take care of each other; there is more inter-jurisdictional cooperation - much more than 10 yrs ago. WSDOT continues to be benevolent. When people have a problem they just call the right person at the appropriate jurisdiction.

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

They work through the MPO. Staff members from the jurisdictions get together on a bi-monthly basis for a multi-jurisdictional meeting at TRPC. Thera Black is the staff member for the group. There is no formal document on this group, but people exchange information in an informal manner. e.g. Crosswalk lights: Olympia had a lot of info on crosswalk safety, and two jurisdictions learned about the information and we able to look at it. Staffs share info openly between jurisdictions..

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

See above.

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

The MPO group brings staff at the jurisdictions together. It's like an extended staff. The existing relationships and the meetings at TRPC are a strong foundation of sharing information.

To share information they use phone and fax. Some, but not all staff at Tumwater use email.

d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries? [Problems]

The only thing really is the structural environment when jurisdictions compete for state or federal dollars. When they need to compete for dollars, each jurisdiction competes on behalf of its own interests.

Having funding criteria for projects can result in jurisdictions not pursuing the best projects, but rather the projects that are most likely to receive funding.

4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? [Project]

The system seems very open. It's a lot more open now than about 10 years ago.

The technical person on the MTP update was great at creating consensus and breaking down barriers.

Shuming brought a higher expectation of the technical portion and focused in on the problems.

a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? [Problems]

As they work on criteria for projects, they are looking at more of a direct allocation of dollars.

As they go through these processes, they are as comfortable with the City and County as I've ever been.

- b. What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

Maintain the open channels.

Make sure as staff changes at TRPC, that the new people are communicators. We've been lucky with good TRPC staff.

- c. What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

ITS for bus passengers (GPS locators, bus arrival info) would be good.

They have been talking for six years on bus preemption at signals but police and fire see it as a proprietary system. Olympia and Lacey police and fire have the preemption ability right now, but they don't want to give up their exclusivity. They are concerned that if the preemption were extended to transit, then the system could malfunction during an emergency and fail to give the emergency vehicles priority over transit.

- 7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

Jay Eaton – Public Works Director.
Police
Fire

WORKSHOP

Yes, interested in workshop.

Port of Olympia, Nick Handy, Executive Director**1. Can you provide a brief summary of the current transportation services that your organization provides?**

(For each type of agency, we need a list of items that we can use to prompt them here. In the case of a transit operator, this list would include: types of service provided (e.g., fixed-route, demand-responsive), contracted out versus operate themselves, number of vehicles and types, service area, etc.).

The Port of Olympia is a public holding company for four different businesses with the primary business being the shipping terminal. They have a 60-acre platform that serves international trade and is connected to BN and Union Pacific Railroads; there is also a road connection to bring freight in. Maritime has access through a deep-water channel.

They also own and manage Olympia Regional Airport with industrial sites at airport designed for warehouse, shipping, and distribution on an interchange near I-5 near airport, and a marina for recreational vehicles coming in by water, and a road network allowing vessels to come in via the road.

Forest products are their biggest business, coming from all over western Washington, including Grays Harbor, east Pierce County and Thurston County. The Port export logs to Japan, imports logs from Canada, receives lumber from other Puget Sound locations, and pulp wood comes in and is made into chips at the Port.

a. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

He is the Executive Director and reports directly to three elected port commissioners.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology? [Shopping list of technologies]

They don't have much if anything. In the past they've had special cargo handling equipment: for example a customer in Seattle shipping containers to far east connected to the CPR program through their Seattle office about what is coming and when it will arrive. This system existed for about two years for that specific customer.

Could use signal priority for freight traffic on the corridor up I-5 to Plum Street to Port - truck traffic travels through six stoplights.

(For each type of agency, we need a checklist of relevant technologies that we can review with them, noting the status of each. Attached are examples of what we've used in the past. We also need to have with us a dummy system architecture diagram showing the basic connections between the transit vehicle, the transit dispatch center and the roadway environment. We can then use that to make supporting notes).

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

They interact very little. They are aware of the various grant programs to improve road networks.

When they plan a road they do it with TRPC and the city and rely on government for funds.

They have a full time planner on staff that works with the county and city on transportation issues and permit issues. Andrea Fontenot, Director of Engineering and Planning, would be best person for stakeholder workshop

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

They do not provide very much. Occasional they provide counts or surveys on vehicles or vessels counts and share with permitting or planning agency like the city, county, or TRPC.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(Need a check-list or prompt list and the same dummy diagram noted in item above).

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

Website information that is directly accessible is a big help

d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries? [Problems]

Ports are competitive with each other, so there is a desire to maintain proprietary information if possible, but that doesn't come into play too much with transportation. The main issue is mostly with proprietary customer information like traffic counts for customers.

Jurisdictional issues are a barrier with all kinds of standards and regulations. They are subject to local governmental processes. They develop and maintain transportation program on their own property.

4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? [Project]

None reported

a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? [Problems]

Customers could use more real time traffic information; anything that helps our customers avoid traffic and move freight faster. Already their stretch of I-5 is more competitive than Seattle or Tacoma because of less I-5 traffic. If I-5 is not viable, the port is not viable.

They are constantly promoting an increase in freight mobility -- rail improvements and removing at grade crossings. Technologies that would help them move products better are needed.

They would like daily service from railroad to their yard, but this might not be an information issue.

- b. What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

Their needs are hard needs, like improved infrastructure such as improving tunnels through Olympia.

- c. What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

- 7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

Andrea Fontenot, Director of Engineering and Planning
Port Commissioner, Jeff Dickison
Plum Creek Timber Company, Tom Shay at Plum Creek Timber

WSDOT Public Transportation Office, Gordon Kirkemo, Mobility Planning Adm.**1. Can you provide a brief summary of the current transportation services that your organization provides?**

(For each type of agency, we need a list of items that we can use to prompt them here. In the case of a transit operator, this list would include: types of service provided (e.g., fixed-route, demand-responsive), contracted out versus operate themselves, number of vehicles and types, service area, etc.).

Provide grant funding to communities including support of ACCT and special needs transportation. In Thurston County, they fund a community group for coordinated delivery model. The Smartcard technology would be relevant to the ITS project.

a. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

There are three offices in the division: public transportation, TDM, and Rail. He administers core program, acts as a liaison to ACCT, and provides technical assistance.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology? [Shopping list of technologies]

(For each type of agency, we need a check-list of relevant technologies that we can review with them, noting the status of each. Attached are examples of what we've used in the past. We also need to have with us a dummy system architecture diagram showing the basic connections between the transit vehicle, the transit dispatch center and the roadway environment. We can then use that to make supporting notes).

Interested in a Smartcard program. When trying to get coordinators to work together this type of program would be helpful. The cost could go back to the various programs to make it easier.

Staff are also interested in procurement; rural and other transit systems may need funding support.

For ACCT and other transit systems mobile data terminals, MDTs devices wired into central dispatch for aiding in dispatch, and vehicle locator systems would be very useful

3. How does your organization interact with other organizations in exercising its transportation responsibilities?**a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?**

(Again, we need to have a specific list of items that we can use as a check-list/prompt. For transit, this list would include, for example, the Section 15 data that transit operators have to report to FTA, transit route and schedule information to special event planners, etc. This list needs to be developed. We should also have a dummy system architecture diagram focusing on connections between different types of agencies. This should be a simplified version of the Nat'l Arch diagrams).

They collect data for all transit systems in the state and do an annual report and a report to the legislature. Through procurement on grant programs, it's helpful to have some idea of what is working so people spend their grant funding wisely.

There are user groups for dispatch. For paratransit, there is a common provider, Trapeze, which WSDOT provides support. In the future they want to make sure staff are trained on future technologies.

Need communication between buses and WSDOT traffic control in Puget Sound.

Getting statistics and data should be provided and is an electronic capability that seems fairly basic.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(Need a check-list or prompt list and the same dummy diagram noted in item above).

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

There is a question of whether they will be doing any of this with current tax cuts.

Getting data off the Internet works well, but not interested in downloading passenger counts.

The system works satisfactorily. The biggest problem is getting them to use it.

d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries? [Problems]

Data is placed on the website once it's completed. There is some problem getting someone to provide the data, it's not the highest priority for agencies

4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? [Project]

The way they relate to the transit systems is always evolving; there is not immediate anticipated change.

All the MPO's, including TRPC, have GIS systems. Others could use that information, including providing a GIS database.

There is a need to develop database resources and allow smaller rural communities to use these tools that they would not otherwise have. If rural areas had access to this information they would see the benefits.

a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? [Problems]

Would like to have access to all information about all transportation services being provided. For example, what DSHS is paying, what all Thurston County transit agencies were paying, and turn down rate. With this information they could do some planning cutting across program lines, not just strictly in the 'transportation' venue, but get into social service activities, then combine with GIS for good inventories. Create a more demand responsive system with automatic real-time information to provide rider and also communications between passengers and vehicle.

- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

Create databases that can talk to each other and agencies can download information from them and they can share data amongst themselves.

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

6. **Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

7. **Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

TDM, Brian Lagerberg, (360) 705-7878

TDM, TJ Johnson, (360) 705-7508

Kathy Sillins, (360) 705-7919

Paul Gamble, may have more IT information (360) 705-7912

WSDOT ACCT, Don Chartock, Research Analyst**1. Can you provide a brief summary of the current transportation services that your organization provides?**

(For each type of agency, we need a list of items that we can use to prompt them here. In the case of a transit operator, this list would include: types of service provided (e.g., fixed-route, demand-responsive), contracted out versus operate themselves, number of vehicles and types, service area, etc.).

a. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

Provide agency coordinated transportation services and information. They act as an umbrella organization to provide and share information, including social services groups and transit. Some counties are considered ACCT counties and some are not.

They also promote coordination of transportation for people with special needs but also transit in general.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology? [Shopping list of technologies]

(For each type of agency, we need a check-list of relevant technologies that we can review with them, noting the status of each. Attached are examples of what we've used in the past. We also need to have with us a dummy system architecture diagram showing the basic connections between the transit vehicle, the transit dispatch center and the roadway environment. We can then use that to make supporting notes).

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

ACCT has a wide-range of interaction with other organizations; often use e-mail or internet services and traditional mail and phones.

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

(Again, we need to have a specific list of items that we can use as a check-list/prompt. For transit, this list would include, for example, the Section 15 data that transit operators have to report to FTA, transit route and schedule information to special event planners, etc. This list needs to be developed. We should also have a dummy system architecture diagram focusing on connections between different types of agencies. This should be a simplified version of the Nat'l Arch diagrams).

Information sharing varies widely and depends on the needs on the projects.

For a special needs transportation study they interviewed every social service group with a transportation element; now they are doing trip planner project.

Since they are we're not a service provider, their needs vary; it's not specified like bus schedules.

Presently they do not receive any real time info - or its limited.

Presently working with Oregon on a trip-planning program. Trip planning information— more than just transit and paratransit – would be helpful. Also some kind of connection to all types of transit and footpaths information; links to highway information, including GIS; direct links to different kinds of providers with links on a website or just phone numbers; and links DSHS.

Need to provide options: by lowest cost or fastest.

GIS could be used to find the where is these nearest park and ride; offer a GIS with map of transfer points; offer mapping of daycare centers and job centers; and other general information like carpools, vanpools.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(Need a check-list or prompt list and the same dummy diagram noted in item above).

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

Email works well to provide a “paper trail.”

d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries? [Problems]

ACCT receives grants for different communities and many of these communities don't use the Internet. If those communities were plugged in - Thurston County is online pretty well –the smaller communities could be part of a large coalition that does have the electronic capabilities to share information.

4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? [Project]

(can use the same dummy architecture diagram as used in items a and b, although we might want a second, clean copy to use for this last item).

Nothing reported.

a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? [Problems]

Provide people and small communities with access to high tech information and services.

b. What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)

Current efforts to coordinate trip planning with Oregon.

- c. What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

Nothing reported.

- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

- 7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

City of Yelm, Cathie Carlson, Community Development Director**1. Can you provide a brief summary of the current transportation services that your organization provides?**

(For each type of agency, we need a list of items that we can use to prompt them here. In the case of a transit operator, this list would include: types of service provided (e.g., fixed-route, demand-responsive), contracted out versus operate themselves, number of vehicles and types, service area, etc.).

Maintenance and construction of street network, also lease a van to the senior center.

Participate with IT policy board and with the TRPC in identifying and meeting needs.

a. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

Major responsibility is to serve as Community Development Director. This requires attending all the transportation related meetings at TRPC and cover transit issues and grants.

City has 37 full time employees. Department of public works is responsible for the construction of public infrastructure

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology? *[Shopping list of technologies]*

(For each type of agency, we need a check-list of relevant technologies that we can review with them, noting the status of each. Attached are examples of what we've used in the past. We also need to have with us a dummy system architecture diagram showing the basic connections between the transit vehicle, the transit dispatch center and the roadway environment. We can then use that to make supporting notes).

The city presently coordinates three signals.

WSDOT calls by phone when there is a closure of I-5 since they are the only other corridor when the interstate is closed. The city places police out at main intersections during these closure events for traffic control.

Presently not many people are online or on email, but this changing. Telephone is the preferred communication mechanism

Other technologies include changeable message signs (CMS) signs on I-5

During the recent earthquake the city received very little information. They would like information on road closures within the county or other cities, and main corridors within Thurston and south Pierce County.

The ability to provide direct information to the community would be good, but this would require staff for promotion and maintenance. Having a third party do promotion and maintenance would work best.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

Staff and policy makers attend transportation advisory committees including Transportation Policy Board, IT Policy Advisory Committee, and CTR Committee.

The city does not share pothole information with other jurisdictions.

WSDOT tells them when they're doing work on SR-507 that is close to Yelm.

If they do work on state highways in the city's boundaries, WSDOT is informed about what's going (some projects are done just by the city, or both city and WSDOT, or just WSDOT).

The public works supervisor and WSDOT have a personal relationship and communicate regularly though phone calls.

There is no formal process with Thurston County; the county sends information to their public works department periodically.

WSDOT does share state highway traffic counts using paper copies; in the future electronic distribution would be best. There is no need for real-time traffic information, but they do use the traffic counts for planning purposes.

TRPC has established meetings with staff and Yelm Community Services – a Yelm non-profit community betterment organization – geared toward low income from head start. The goal is to meet and work with Yelm community groups. They have a lot of low to moderate-income folks and Yelm Community Services provides services to these residents.

- a. **What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?**
- b. **What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?**

(Need a check-list or prompt list and the same dummy diagram noted in item above).

- c. **What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?**

The meeting processes are working very well; they bring everyone into the loop. The TRPC have a regional transportation model that is really good.

TAC meetings and different participants in the process work well – it's a continuous education process.

- d. **What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries? *[Problems]***

The biggest barrier is a lack of what they need to know, if you don't know what you need to know, you can't know how or where to get it. Also don't know the right questions to ask. and what data is available, e.g. accident data from state patrol.

4. **What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? [Project]**

TRPC is great and spearheads a lot of programs; the city relies heavily on them.

- a. **To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? [Problems]**

The current system is working fairly well, but without knowing about other means of sharing data that is out there, it's hard to say.

- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

At TRPC, all data is in GIS, while the Thurston County data center is a separate group from TRPC. Yelm can access the Thurston County geographic data site, but it's fairly limited (zoning and contour lines, critical areas). Efforts should be made to try and link TRPC's GIS with the County's data center.

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

The role they have assumed in spearheading projects of regional significance. Their staff are really supportive of local jurisdiction's staff.

6. **Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

7. **Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

Yelm Community Services
(360) 458-7000
Cindy Cecil E.D.

Would certainly like packet of info
Interested in workshop - would be best person for Yelm
Would like the pre meeting coffee

City of Lacey, Director of Public Works (Dennis Ritter)

Interviewer: Don Creighton (Battelle) – follow-up interview done by phone on May 18th, 2001

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

- Transportations services, new streets
 - Signals
 - Round-about
 - Utilities
 - Waste water/storm water
 - Not sewage
 - Parks
 - Engineering survey for development or review

For the signal systems we are coordinating signals on five stretches along Martin Way and crossing at College Street. We have 170 controllers and Traconex deployed now.

We don't (yet) have a traffic operations center (TOC); but we have three staff in the Traffic Management section. We don't have dynamic message signs. We do derive traffic counts from our signal systems.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

Our fleet maintenance vehicles have radios, we use two frequencies, and we do coordinate through CAPCOM and respond to 911. We also use cell phones to conduct our business.

Our signal systems are equipped with signal preemption—the emergency responders use Opticom. The police have mobile data terminals (MDT) in their vehicles.

We have a close coordination and good working relationships with Tumwater and Olympia.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

We share data and information in our annual traffic improvement program—the agenda there indicates that we need to coordinate our Pacific Avenue signals.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

We get traffic count data from signals in the county as well as our own.

- c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?**

We use (successfully) telephone, Internet and email, fax mailing lists to the world (~30 destinations). We have a pretty good Emergency Management Plan and a Public Relations Director that does the information dissemination to media, etc.

When we have a closure accident on I-5, we route traffic on Martin Way (old Pacific Highway)—the WSP does that—it works well.

During the earthquake, things worked well; we coordinated with the county, state and Camp Murray (State Emergency Management); and very well with Ft. Lewis and McCord AFB.

- d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?**

We have some challenges—the rural areas for one. Lacey is conservative; Olympia is liberal (with \$).

- 4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?**

We need more direct communications—this might be worthy of investment in “dedicated infrastructure”. Also, if we could get cellular capability dedicated to public sector use—that would be good too. We use Intranets, but those can be affected by jammed phone lines.

- a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**
- b. What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

Don't know if this fits here but we were looking at a regional project up in Lynnwood where they've done a “dynamic control of traffic progression” with incident detection and massive platoon of traffic. Would that work here in Lacey (Olympia)?

- c. What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

We'd like to do more/better air quality monitoring in certain parts of Lacey. We'd like to track that AQ monitoring in conjunction with traffic signal timings and coordination plans.

7. **Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

N/A

Jim Tutton, Washington Trucking Association**1. Can you provide a brief summary of the current transportation services that your organization provides?**

(For each type of agency, we need a list of items that we can use to prompt them here. In the case of a transit operator, this list would include: types of service provided (e.g., fixed-route, demand-responsive), contracted out versus operate themselves, number of vehicles and types, service area, etc.).

Washington Trucking Association is a membership driven trade organization. It also provides business services for its members including health insurance and lobbying.

Members include freight services, household goods, and dump truck and log truck operators.

For Thurston County, timber is the most important product. Logs come from the Olympic Peninsula and east Thurston County. The Port of Olympia is Washington's top water port for logs and lumber.

a. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

Vice President of Organization. He provides overall leadership to staff and to members

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology? *[Shopping list of technologies]*

(For each type of agency, we need a check-list of relevant technologies that we can review with them, noting the status of each. Attached are examples of what we've used in the past. We also need to have with us a dummy system architecture diagram showing the basic connections between the transit vehicle, the transit dispatch center and the roadway environment. We can then use that to make supporting notes).

WTA members are involved in weigh station bypass projects. Jim Tutton is the point person for WTA on this issue. Freight is moving toward the technology of a paperless truck. For truckers the way station bypass is a major issue. It also allows police to focus on illegal, unsafe carriers.

GPS is available for a numbers of trucking companies and more companies are using it as they can afford it. In the future they will move toward electronic logbooks

How does your organization interact with other organizations in exercising its transportation responsibilities?

WTA interacts with a number of organizations in Puget Sound as an informer of what trucking can and cannot do. Anything that allows WTA to strengthen freight mobility in Puget Sound is a move in the right direction

Members interact on the business level involving issues such as permits, proper licensees, and B&O taxes.

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

25-30 percent of members are connected to the Internet. Information needs involve revenues and vehicle registration.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

WSDOT provides access to their website for mountain pass information, traffic congestion and radio updates. They also provide special permitting for oversize, overweight loads.

Now WTA does this as a service to the carriers (WTA is an agent for DOT in this case).

Members can fax information into WTA, and then WTA processes the paperwork (permits, etc.) for them.

WSDOT is working on making permitting process a web based process so carriers could go directly to WSDOT and do electronic financial transactions for permits and taxes.

There is currently no date set for implementing, but WSDOT is working on it.

(Need a check-list or prompt list and the same dummy diagram noted in item above).

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

That which is commonly formatted for electronic receipt like cell phone, email, website technologies work well. Primary information tool for members is the cell phone because they have access to cell phones. Some trucks have computers in the cabs. Having information in electronic format is much easier to use.

Electronic message reader boards are helpful, and "No flammables in Mt. Baker Tunnel" are especially helpful for out of state truckers.

MS Word is better, more common denominator than Word Perfect.

The ultimate challenge is to get electronic text messaging on computers in trucks.

d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries? [Problems]

Funding is an issue. Member carriers don't have the funds to upgrade to newer systems.

Also only 25 percent of state weigh stations are converted at this point. The primarily issue of getting information to drivers is communication between the dispatcher and driver. They don't have the best technology at this point.

4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)? [Project]

(can use the same dummy architecture diagram as used in items a and b, although we might want a second, clean copy to use for this last item).

- a. **To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement? [Problems]**
- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

WTA does not have any information on what the TRPC is doing with planning. WTA should be a player in the planning stages for planning, especially routings in and around county, routings into the Port.

For funding, involve WTA in decisions regarding underpass/overpass for rail and trucks. They could lend their assistance on funding issues. Also, they should involve WTA on where they want freight to go.

WTA could also provide guidance and concurrences on grants.

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

Perhaps as a mediator if a carrier had an issue with a particular city. They could bring the carrier and the city together and discuss what the larger planning goals are for the city and find a mutually beneficial solution.

6. **Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

Freight movements, when considered in any planning process, often take a back seat, so the WTA wants to play an active role on behalf of carriers to help freight mobility – and to help commuter and transit movement.

7. **Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

Weyerhaeuser, John Finker, Transportation contact

Intercity Transit (Development, Planning and Maintenance Departments)

Interviewer: (Questionnaire was self-completed by respondents)

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(See attached information from WSDOT annual transit system summary report for overall agency description, including services, vehicles, etc.)

(Development Department)

Procurement, Grants, Planning, Marketing & Communications

(Maintenance Department)

The main department responsibility is to maintain I.T.'s fleet and facilities. Personal responsibility is in maintenance department policy development, workforce development, and vehicle/facility equipment procurement specifications.

(Planning Department)

Develops and implements I.T.'s Six-Year Plan. This includes developing projections and analyses that form the basis for proposed changes, leading public process prior to the plan's adoption and monitoring the results.

Implements the Six-Year plan's recommendations, developing routes, schedules and operator assignments.

Monitors and comments on proposed developments, street improvements and development regulations with the goal of ensuring transit-friendly development.

Assists in long-range strategic planning.

Administers Thurston County's Commute Trip Reduction program under a contract with Olympia, Lacey, Tumwater, Yelm and Thurston County.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

(see attached matrix)

(Development Department)

GIS – using a base map developed by Thurston Regional Planning Council, we are developing layers for bus routes and fixed facilities along the routes. We also use data layers for identifying voting precinct lines, population densities and other miscellaneous activity. A current project is making a database of bus stop photos and other bus stop data directly addressable from the map just by clicking on the bus stop. A variety of other bus operating information is also available.

Run cutting – We use a combination of manual and the FleetNet software module for run cutting.

Scheduling – We use a combination of Excel spreadsheets, Access database and FleetNet software.

Purchasing – We use purchasing and inventory modules from the FleetNet software. We are interested in bar coding for the inventory function and some sort of automated data entry for fluid and other work performed on equipment.

(Maintenance Department)

The only current ITS technology currently used is the TCAD radio system that will send preprogrammed data from the vehicle radio to dispatch. My vision would be to have ALL operating conditions of the vehicle to be accessed immediately by maintenance staff to help determine PRIOR to failure the condition of a vehicle. In addition, I would be interested in being able to have maintenance data from other systems available as it happens. I can see systems such as GPS or similar vehicle tracking systems utilized in our organization in the future.

Most of the major components of the vehicle, including the electrical systems, on the 900 series buses have diagnostic software installed on the laptops. The mechanics plug in the lap top or hand held to the vehicle and can check electrical circuits, check for trouble codes, and look at component operating parameters, etc. Most software tracks problem codes with the history of when the problem was detected. The software also allows the mechanic to check the problem after the repair to verify that the problem is fixed. We have the equipment and software for systems such as transmission, ABS brakes, engines, and electrical.

I am not sure how I would explain this on the excel spread sheet but this is the type of data that would be great to get through ITS. As an example, If we could get the data via a computer at the Foreman's counter we could prevent and/or respond to failures more efficient. Smart bus technologies are now tracking everything from air pressures in tires, brake lining thickness in disc brakes, cab temperatures and all the component operating parameters.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

(Development Department)

We have no direct data links. Express service in Pierce County is able to contact via 2-way radio the Pierce dispatcher. The Pierce Olympia Express buses can also contact the I.T. dispatcher.

(Planning Department)

We have close and ongoing interactions with local cities, towns, colleges, non-profit organizations, state government, the Thurston Regional Planning Council and Thurston County. Most interactions are direct communications about areas of common interest such as:

Proposed developments, detours and street improvements. Such interactions tend to be with professional engineering and planning staff members.

Coordination of long-range transportation plans. Such efforts attempt to predict future transportation services and ridership so cities can predict transit's needs and needed highway capacity improvements.

Implementation and administration of prepaid pass programs.

Problem solving for residents who have contacted their local jurisdiction.

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

(Development Department)

Manual or email data sharing of timetable information.

(Maintenance Department)

The maintenance department shares information to other Washington transit systems via email when fleet failures occur, performance measurements of fleets and sub components.

(Planning Department)

General statistics, including ridership (tabular), system costs (tabular), neighborhoods served (maps), service policies (text), and future plans (text).

Specific ridership information - how many people get on/off at a specific bus stop or near a specific community activity center.

Long-range plans and planning documents.

Route and schedule information. We provide a mix of electronic and printed versions to many different organizations.

Commuter trip reduction information. Employers affected by the Commute Trip Reduction (CTR) Act, numbers of employees, measures they have implemented and the effects upon SOV usage (tabular and text).

Communications about the CTR program to affected employers. Information about program requirements, upcoming activities and tips for encouraging alternate modes (email).

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(Maintenance Department)

Same as A

(Planning Department)

Changes to jurisdictions' ordinances and regulations (some are printed. Communities are rapidly putting this information on the Internet.)

Proposed developments (generally on paper).

Road construction and detours (verbal or on paper).

City's often relay citizen requests and concerns (Verbal, email or on paper).

Demographic analyses (Currently almost all come as printed documents).

CTR surveys and reports from major worksites. (Paper)

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

(Maintenance Department)

Group emailing works well however it requires someone to ask for or send the data. If specific data could be sent or accessed from others without having to email we could be a lot more efficient.

(Planning Department)

Our current information sharing is traditional and issue oriented. It works well by keeping partner organizations informed about ongoing.

- d. **What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?**

(Maintenance Department)

We do not necessarily get clear data, because of the formatting and interpretation differences between jurisdictions.

(Planning Department)

A few worksites do not yet have email or severely restrict employees' use of external emails. We must then rely on surface mails.

4. **What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?**

- a. **To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**

(Planning Department)

Timeliness is the key. I believe that public transportation will only survive as a workable alternative to private autos if change can be nearly immediate. Using our current system, it can take as long as 18 months for a good suggestion to become service on the street. Meanwhile, a motorist sees an alternative way to work and tries it the next morning. While it is unrealistic to assume we can ever make major changes overnight, we should work to speed up the process of change whenever possible.

Accomplishing this goal will require that public transit agencies fundamentally restructure the way they conduct public process, inform their passengers and assign work to operators. ITS technologies may assist in each of these areas. The first way I see this happening is by de-emphasizing printed materials and making electronic information more readily available to riders. We may need printed timetables but they constitute a huge obstacle to customer responsiveness. Whenever possible, we should encourage the use of electronic information, which has the benefit of short turnaround and low distribution costs.

The second major delay when implementing change is the need for public process. Public meeting, often involving only a handful of people, is time-consuming and does not reach a true cross section of riders or the general population. The more we can move towards "electronic town halls," with information disseminated and feedback returned via the Internet.

Unrelated to these issues is our need to collect ridership information that is cost-effective, timely and accurate. Technologies that will allow us to automate the process of counting passengers, tracking where they board and their method of fare payments will pay long-term dividends. Additionally, it will be difficult to expand our current fare subsidy programs (now in place at both colleges, the state and county) to additional employers unless we have a way of tracking pass usage for each program.

- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

(Planning Department)

I see little role for TRPC.

- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

(Planning Department)
Covered above.

- 7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

(Planning Department)
I intentionally ignored the ITS needs of the Paratransit Division, both for operation of the Dial-A-Lift system and deviated fixed route services. Depending upon their plans, there may be applications they should consider.

Grays Harbor Transportation Authority (Dave Rostedt, Manager)

Interviewer: (Questionnaire was self-completed by respondent)

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(See attached information from WSDOT annual transit system summary report for overall agency description, including services, vehicles, etc.)

Director of Operations

Responsibilities include oversee day to day operation of system. Oversee planning and implementation of routes and schedules.

Involved in ordering equipment, buses.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

Currently using Rides Unlimited scheduling software for our paratransit service. Two way radio communications one frequency for fixed routes buses and one frequency for paratransit service.

Security cameras for Aberdeen Station.

Vision for the future:

Replace current software with schedule and mapping capabilities with some type of tracking feature for paratransit service. Add software at Aberdeen Station to enable dispatch to monitor all cameras. Install digital cameras in all buses. Some type of real time communications with other agencies.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

Share schedule information via telephone and printed schedules. Share organizational information through WSTIP Insurance Pool web page.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

Same as above.

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

Connecting dispatch control centers with neighboring agencies with computer servers could enable agencies to share all types of information.

- d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?**

No effective way to share highway information or manage traffic control at jurisdictional boundaries.

- 4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?**
 - a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**

Some type of Internet connection with Department of Transportation that alerts all agencies of up to date road closures.

- b. What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**
- c. What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**
- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**
- 7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

Sound Transit (Nick Roach, Research and Technology Project Manager)

Interviewer: Matt Burt, BRW

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(See attached information from WSDOT annual transit system summary report for overall agency description, including services, vehicles, etc.)

Sound Transit is the agency in the Puget Sound region that is charged with addressing regional public transit needs, above and beyond the local transit services provided by the areas various county transit systems. Specifically, Sound Transit is charged with planning, building and operating a high-capacity transportation system for the region.

Sound Transit's 1996 ten-year regional transit system plan ("Sound Move") identifies the following key features:

- 25 miles of new light rail transit (LRT)
- 82 miles of commuter rail service
- more than 100 miles of HOV expressway
- 18 new regional express bus routes, primarily using the HOV expressway network

Currently, the initial 1.6 mile LRT segment linking downtown Tacoma to the Tacoma Dome is under construction and expected to become operational in 2002. The LRT system is called "Link". The initial phase of commuter rail service, between Tacoma and Seattle, began operating in 2000. The commuter rail service is called "Sounder". Sound Transit's role in the development of the regional HOV expressway system consists of constructing 14 specially designed direct access freeway on/off ramps, which will allow Sound Transit express buses to bypass interchange congestion. Currently one set of ramps has been constructed with seven additional ramps to become operational between 2001 and 2004, followed by an additional six ramps between 2004 and 2006. The 18 regional express bus routes, operated under contract by the local transit operators (King County Metro, Pierce Transit, Everett Transit and Community Transit), provide high-speed, frequent (generally every 15 minutes), two-way service to major regional centers and destinations throughout the day and evening.

Sound Transit services interface closely with local transit service provided by the other area bus operators and with the Washington State Ferry System. The Tacoma Dome multi-modal transportation hub and the I-5/SR 12 Park and Ride are two of the primary locations where Sound Transit express bus (operated under contract by Pierce Transit) and other Sound Transit services (e.g., LRT at the Tacoma Dome) interface. The primary linkage between Intercity Transit and transit in the Puget Sound area is via Pierce Transit bus service to the SR 512 Park and Ride location, which is also served by Intercity Transit. Intercity Transit also serves Tacoma Mall (one route), Tacoma Community College (one route) and Downtown Tacoma (two routes) and connections to Sound Transit and other Puget Sound area transit service can be accommodated from these locations, primarily via Pierce Transit.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

(Sound Transit, along with Pierce Transit, Community Transit, King County Metro, Everett Transit, Kitsap Transit and Washington State Ferries are currently completing development of an ITS architecture for

transit in the Puget Sound area, and participating with other transportation agencies in an overall, regional, multi-modal ITS architecture for the area. The attached tables and figures are taken from the draft, March 12, 2001 Puget Sound Regional ITS Architecture and supplement the overview information presented in this section).

Currently, Sound Transit utilizes traffic signal priority systems for their LRT and commuter rail operations and the Sound Transit express bus service operated under contract by the other local transit agencies features a variety of ITS applications, varying by operator, including: traffic signal priority, vehicle location tracking and schedule adherence monitoring, security monitoring, vehicle maintenance management systems and on-board vehicle maintenance monitoring.

Sound Transit is participating in the development of an integrated, regional, multi-modal smart card electronic payment system project. Consultant proposals are now being evaluated and the contract will be awarded in the Spring of 2001. When implemented, the smart card system will allow seamless fare payment across transit services provided by Sound Transit and its partner agencies. Sound Transit is also participating in a regional transit trip planning system, the Regional Automated Trip Planning (RATP) system that will provide schedule and route information for Pierce Transit, Community Transit, King County Metro and Sound Transit, and allow customers to seamlessly plan a trip itinerary involving multiple providers.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

(See attached information on architecture flows from the draft Puget Sound Regional ITS Architecture, March 12, 2001).

Sound Transit currently does not provide or receive “operational data” to/from Intercity Transit, although they do share information with one another and Intercity Transit has observed the development of the Puget Sound Regional ITS Architecture through participation in the Regional Transit Technology Group.

Major information/data interchanges between Sound Transit and other agencies/entities include (expressed as architecture flows):

- local traffic control priority request from on-board transit signal priority to roadside signal priority
- traffic signal priority status from roadside subsystem to transit center multi-modal coordination
- route/schedule information from transit center tracking and dispatch to Regional Automated Trip Planning
- transit fare payment data from transit center fare and load management to clearinghouse system (smart card)

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(See attached information on architecture flows from the draft Puget Sound Regional ITS Architecture, March 12, 2001, and answer to preceding question).

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

- d. **What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?**

- 4. **What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?**

(See attached tables and diagrams from the draft Puget Sound Regional ITS Architecture, March 12, 2001).

- a. **To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**

- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

- 6. **Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

- 7. **Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

- 8. **What opportunities exist for increasing the level of interaction (e.g., cooperation, coordination, information sharing, etc.) between Sound Transit (and other Puget Sound transit services) and Intercity Transit?**

Twin Transit (Patty Alvord, Manager)

Interviewer: Matt Burt, BRW

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(See attached information from WSDOT annual transit system summary report for overall agency description, including services, vehicles, etc.)

Twin Transit serves the cities of Centralia and Chehalis in Lewis County, which is located south of Thurston County. The combined two-city service area is approximately 10 square miles. The agency provides fixed route service with seven buses operating on four routes, and using a single mini-bus, provides demand-responsive paratransit service to those who cannot use the fixed route service. The fixed-route vehicles are a combination of 30-foot vehicles and mini-buses. The demand-responsive paratransit requires a 24-hour advance reservation. No same day trip requests are allowed. The fixed route buses do perform some route deviations, which somewhat reduces the demand for the paratransit service. The route deviation trip requests require a 24-hour advance reservation.

Service is provided on weekdays generally between 6:30 AM and 8:00 PM; Saturdays generally between 8:30 AM and 6:00 PM; Sundays generally between 8:30 AM and 5:00 PM. The agency operates all of their own service (rather than contracting out). The primary local source of funding is a \$0.1 sales tax, authorized in 1985. The loss of state Motor Vehicle Excise Tax funds (i.e., the legislative action that began with Initiative 695) has led the agency to scale back services and additional cut-backs will occur in the future.

Twin Transit formerly connected with Intercity Transit but the connection was dropped due to low ridership. The connection was made at the I-5 interchange at Grand Mound, located north of Centralia. This lack of connection is currently the only missing link in continuous transit service along the entire I-5 corridor.

Currently Twin Transit connects with two other small transit agencies: Lewis Mountain Highway Transit and the Lower Columbia Community Action Council. Lewis Mountain operates in the eastern end of Lewis County and provides service to the general public. The agency operates one bus route that makes three trips to one of the two main Twin Transit transfer points, the Lewis County Mall, Monday through Friday. From the Lewis County Mall, Lewis Mountain riders can access any of the Twin Transit routes. Lower Columbia transit provides service to the general public using four vehicles, one of which provides service to Twin Transit's Lewis County Mall transfer point three times per day on Mondays and Fridays. The number of riders connecting from these other services is not monitored. In the future, using grant funding, Twin Transit will begin meeting the Lower Columbia service farther south, rather than at the current Centralia location. The service will be increased to Monday through Friday operation.

Other transit services in the county include Greyhound intercity bus, which serves Centralia and provides service to Seattle, and Amtrak rail service in Centralia. The Amtrak station is Twin Transit's main transfer point. Twin Transit does provide connections to both Greyhound and Amtrak.

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

Due to its small size and funding constraints, Twin Transit does not utilize, nor plans to implement, much in the way of technology. The area economy is depressed, and with basic services like education

struggling for funding, transit is not the highest priority. The loss of Motor Vehicle Excise Tax funding, which reduced their funding by 45%, has further constrained the agency.

Computers were introduced to the agency in 1995. The Motorola radio system is over 25 years old; fare boxes are standard manual type, with drivers keeping track of the number and type of fares and passenger boardings with manual counters; uses an in-house database of clients but does not utilize commercial scheduling or run-cutting software. The agency does not operate a web site. Information is provided to the public via standard printed route and schedule material, and via a telephone customer service operator.

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

Due to their size and limited interaction with other transit services, Twin Transit does not exchange much information with other agencies. Due to their size they are exempted from reporting to the Federal Transit Administration (i.e., Section 15). The agency does submit an annual State Auditors Financial Report and provides information for the Washington Department of Transportation annual transit summary report.

Coordination with the two other transit services that Twin Transit connects with (Lewis Mountain and Lower Columbia) is achieved through occasional telephone calls or in-person meetings. The agency typically does not coordinate directly with the drivers from these services, or with the dispatchers. The services operated by Twin Transit and these other agencies are fairly reliable, and schedules are loose enough that close coordination of connections is not necessary.

Information regarding roadway construction, maintenance and closures is usually obtained via telephone from the responsible agency, although this communication is somewhat sporadic and often Twin Transit drivers reports from the field are often the first source of information. Generally, providing this information to Twin Transit is not seen as a high priority for the other agencies.

The Twin Transit vehicles are on the list of county emergency services resources and sometimes they are utilized in emergencies, such as evacuations.

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

See previous answer.

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

The relatively minimal, low-tech approach to information sharing utilized by Twin Transit is a product of the size and complexity of their operation, which is relatively small and simple. The current approaches generally work well, although as noted above, information from roadway agencies regarding construction, maintenance and closures is often not forthcoming. To the extent that there is any need for increased information sharing, and there is little need, the constraints are time/resources (on the part of Twin Transit and other agencies) and a lack of priority for such exchanges on the part of other agencies. Overall, the only major barriers faced by Twin Transit are the lack of political support for transit, and the resulting financial constraints which result.

- d. **What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?**

See previous answer.

4. **What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?**
- a. **To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**

None identified.

- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

None identified.

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**

(Twin Transit is not located within the Thurston Regional Planning Council study area. The regional planning agency for the Twin Transit area is the Southwest Regional Transportation Planning Organization).

The Washington Department of Transportation is concerned about the current “hole” in continuous transit service that exists currently between Lewis County and Thurston County, and the TRPC should also be concerned. Small transit agencies like Twin Transit rely heavily upon regional planning agencies for technical assistance and more help in this area would be useful.

6. **Now that we’ve had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

For Twin Transit, the biggest issue is funding—the state needs to establish a permanent funding source to replace the Motor Vehicle Excise Tax. Agencies like Twin Transit can’t think about spending money on technology improvements when they are being forced to cut basic service due to funding cut-backs.

If funding continues as it is, the linkage to Intercity Transit will not be revived.

Currently, Twin Transit does participate in group (i.e., state) procurements of vehicles and if and when the agency upgrades their technologies they would want to pursue the same sort of approach.

Twin Transit relies on Intercity Transit, as a larger and more technologically sophisticated agency, for considerable information and advice, and would expect that in the future Intercity Transit would take the lead in developing technology implementation approaches and that if and when funding allows, Twin Transit would follow their lead.

7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?

We may want to check in with Lewis Mountain and Lower Columbia transit, the two other public bus transit services that Twin Transit connects with.

Pierce Transit (Keith Messner, Information Systems Manager)

Interviewer: Matt Burt, BRW

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(See attached information from WSDOT annual transit system summary report for overall agency description, including services, vehicles, etc.)

Mr. Messner is the I/S for Pierce Transit. His responsibilities include managing all aspects of technology at Pierce Transit. This includes day-to-day I/S operations and most technology projects throughout the Agency.

Pierce transit provides fixed-route bus service and demand-responsive paratransit service in Pierce County, Washington. The agency also provides connections to Intercity Transit in to the south and King Metro Transit to the north. The agency operates 189 fixed-route buses and 106 demand-responsive paratransit vehicles. Fixed route buses are a combination of 10 sixty foot articulated coaches and 179 forty foot coaches (all coaches are wheelchair compatible). Paratransit vehicles are mini-buses and vans (all paratransit vehicles are wheelchair compatible). The paratransit service, SHUTTLE, provides shared-ride service to riders unable to ride regular buses. SHUTTLE provides door-to-door service, and in some cases, access to transit centers to connect to regular bus routes. Reservations for the SHUTTLE service may be made between one and five days in advance (no same day reservations are accepted).

The primary location for transfers to and from Intercity Transit is the SR 512 Park and Ride, located at the I-5/SR 512 interchange near Lakewood, Washington, in west central Pierce County. The SR 512 Park and Ride is a key express bus service location; four of the five express bus routes to/from Seattle operated by Pierce Transit ("Seattle Express" routes) serve the site. Seattle Express service is provided both to and from Seattle seven days per week. Intercity Transit serves the SR 512 Park and Ride location with four express routes. Intercity transit also provides service to the following locations within Pierce County, where connections to Pierce transit routes may be made: Tacoma Mall (1 route), Tacoma Community College (1 route) and Downtown Tacoma (two routes).

Transfers to/from King County Metro Transit occur at all Express route bus stops in Seattle (eight stops), Express route stops in Federal Way (at the SeaTac Park and Ride), and the Express route to SeaTac International Airport (at the SeaTac Park and Ride, the Star Lake Freeway Station, the Kent/Des Moines Freeway Station, and at the SeaTac Airport).

The major multi-modal transportation hub for Tacoma-Pierce County transportation is the new Tacoma Dome station. The station includes a large parking garage and is served by the Seattle Express express bus service, Greyhound commercial intercity bus, SeaTac Airport Express express bus service, downtown Tacoma bus service, four Pierce Transit local bus routes, and Sound Transit's Sounder commuter trains. Light Rail is scheduled to use the station once service begins (construction on the light rail has just begun).

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

(See attached excerpts from Draft Puget Sound Regional ITS Architecture, especially the inventory matrix)

Currently, Pierce Transit utilizes the following ITS technologies:

- scheduling/run-cutting software for fixed-route and paratransit (Giro's "Hastus" for fixed-route and Trapeze's "PASS" for paratransit)
- automated itinerary planning system (phone operators and public Internet access)
- mobile data terminals (implementing now in 80-100 vehicles, using microwave communications; Mentor Engineering is MDT vendor) paratransit vehicles only.
- traffic signal priority (demonstration phase now to include about 12 intersections, plans to increase to over 110 intersections within two years; 3M's Opticom system)
- commercial vehicle maintenance software (part of overall agency computerized financial system, "SCI Financials")
- surveillance cameras and panic buttons (at the Tacoma Dome station)
- on-board vehicle data collection (hubometers, accessed via laptop computers)
- on-board security monitoring (video on a few vehicles but no real-time monitoring; radios have covert audio monitoring capability)
- "smart bus" demonstration (in conjunctions with Sound Transit, will have a single vehicle moving from agency to agency, demonstrating vehicle diagnostics, audio and video stop annunciation, and hybrid engine technology – both diesel/electric and CNG/electric, etc.)

The automated itinerary planning system project ("Regional Automated Trip Planning" is a joint effort of Pierce Transit, King County Metro, Community Transit and Everett Transit. Each agency uses the same brand of software (Management Technology MSSC), housed on their own server. King County Metro maintains a master server and all database updates are consolidated there, and then copied over to the other agencies' servers (via Internet FTP). Schedule and route information is exported to the system from the scheduling software. The system uses a commercial map (MapInfo), which is updated by Pierce Transit. Currently, the trip planning systems operate independently in each of the four transit agency service areas. Efforts are currently underway to tie the route map overlays of each transit agency together to provide for regional integration of the system.

In addition to these current technology projects, a number of additional applications are in the development stage, including:

Automatic vehicle location (GPS-based, probably using CDPD communications; start with installation on paratransit vehicles, perhaps moving to more dynamic dispatching).

Integrated regional smart card electronic payment system.

The smart card project is a coordinated regional effort involving Pierce Transit, King County Metro, Community Transit, Everett Transit, Washington State Ferries, Kitsap Transit and Sound Transit. The smart card will operate across a variety modes and provide stored value, period pass and other payment options. Currently vendor proposals are being evaluated.

Other potential future projects include a new, separate vehicle maintenance software package.

The current management at Pierce Transit have expressed concern about the value of some ITS projects in relation to their costs. In the past, technology projects at the agency have not been as well coordinated as they could have been, being spread out across different departments. It is expected that in the future, a single technology oversight staff position will be established to help coordinate activities.

- 3. How does your organization interact with other organizations in exercising its transportation responsibilities?**
- a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?**

(See attached excerpts from Draft Puget Sound Regional ITS Architecture, especially the physical architecture diagram and architecture flow table.)

Updated schedule and route information is provided to King County Metro via the Internet for consolidation and distribution to the other transit agencies partnering on the Regional Automated Trip Planning system.

The traffic signal priority system will utilize an optical emitter located on the bus that will transmit a signal to a sensor located on the traffic signal head to activate the signal priority.

What data/information do you provide to Intercity Transit?

None at this time – that I know of.

- b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?**

(See attached excerpts from Draft Puget Sound Regional ITS Architecture, especially the physical architecture diagram and architecture flow table.)

Sound Transit provides its updated schedule prior to our thrice yearly service changes. Both King County Metro and Community Transit provide updated route changes for their service changes.

- c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?**

Information sharing about routes works very well. Development of this data does take quite a bit of time – it would aid our scheduling department if we could get other Agency's data sooner. Many times we are pressed for time to create our new service changes because we are still waiting on other Agency information.

- d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?**

None

- 4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?**

(See attached excerpts from Draft Puget Sound Regional ITS Architecture.)

- a. To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**

Everyone using the same program for scheduling would aid in the ability to process changes in each Agency regarding other Agency information. Common GIS information would aid also. Currently each Agency (except Pierce Transit) has it's own GIS department, and maps are developed and updated in-house. There is no inter-Agency cooperation. PT buys a commercial map from Mapinfo because they have no GIS Department.

b. What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)

The smart card/electronic fare payment project being developed now by Pierce Transit and partner agencies may create opportunities for Intercity Transit in the future. For example, the procurement may be structured to provide Intercity Transit the benefit of the larger, Puget Sound region-wide procurement that is planned. A similar sort of arrangement could be possible with scheduling/run-cutting software. Pierce Transit is willing to share in-house developed software with Intercity Transit.

What opportunities exist for increased coordination with Intercity Transit?

Participate with regional Agencies in the Regional Transit Technology Committee at Sound Transit, become active with the Puget Sound Regional Council's ITS Advisor Committee.

c. What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?

Pierce Transit is located in Pierce County, and is therefore not within the TRPC planning area.

Currently, there is limited interaction between Pierce Transit and Intercity Transit in Thurston County. Most of the interaction would occur at the planning level, rather than the operational level. The planning contacts are George Patton (Intercity Transit) and Tim Payne (Pierce Transit).

6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?

No.

7. Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?

Tim Payne – Pierce Transit Senior Transportation Planning Manger. 253-581-8127. He would have more info on scheduling information and signal priority.

King County Department of Transportation - Metro Transit Division (Dan Overgaard,
Supervisor, Management Information and Transit Technology Section)

Interviewer: Matt Burt (BRW)

1. What are the responsibilities of your section / department of your organization? What are your individual responsibilities?

(See attached information from WSDOT annual transit system summary report for overall agency description, including services, vehicles, etc.)

2. What transportation technologies does your organization currently utilize, will be implementing (funding has been committed), plan to implement (identified in a plan but not yet funded), or is considering implementing? What is your vision for the future of your organization, and where do you see opportunities for the use of technology?

(See attached excerpts from Draft Puget Sound Regional ITS Architecture, especially the inventory matrix.)

3. How does your organization interact with other organizations in exercising its transportation responsibilities?

a. What information/data do you provide to other organizations, and what systems or methods do you employ to provide it?

(See attached excerpts from Draft Puget Sound Regional ITS Architecture, especially the physical architecture diagram and architecture flow table)

b. What information/data do other organizations provide to you, and what systems or methods do they employ to provide it?

(See attached excerpts from Draft Puget Sound Regional ITS Architecture, especially the physical architecture diagram and architecture flow table)

c. What aspects of your information sharing process work well? What technical or organization elements contribute to effective information sharing? How can we build upon those successful elements?

d. What are some of the barriers to sharing information among jurisdictions? What can we do to overcome these barriers? Are there any issues with managing traffic control at jurisdictional boundaries?

4. What changes are planned for the interactions you have with other organizations (for example, additional information/data that you will receive or provide, or other changes in relationships with other organizations)?

(See attached excerpts from Draft Puget Sound Regional ITS Architecture)

- a. **To allow you to do your job more effectively, what changes could be made in the way your organization interacts with and shares information with other groups? What technologies would facilitate such an improvement?**
- b. **What opportunities exist that we should be aware of for the Thurston Regional Planning Council (TRPC) planning process? (i.e. opportunities to coordinate with regional plans, possible funding requests, etc.)**

The most logical areas for Intercity Transit to be involved in Puget Sound regional ITS deployment, and with the ITS activities of King County Metro, are the Regional Automated Trip Planning system and the regional integrated smart card electronic fare payment project.

Generally, technology deployments that can provide direct customer benefits, such as customer information systems, provide the greatest return on investment. Automatic vehicle location systems are great but hard to justify if the information from the system is not being provided to the customer.

- c. **What role should the TRPC play in helping you overcome your issues and exploiting your opportunities?**
- 6. Now that we've had this discussion, does it remind you of any other challenges or needs that would enhance the services you provide?**

(This discussion focused on lessons learned relative to King County Metro's involvement in the development of the Puget Sound Regional ITS Architecture, and their overall perspective on technology implementation)

Overall, King County Metro is still trying to figure out how to apply the regional architecture at the individual project level. The systems and data formats used by King County Metro are highly specialized, and typically proprietary. Although they can be depicted using the generic national ITS architecture terms and diagrams, actually integrating the King County systems with other systems, and utilizing NTCIP standards, will be very challenging. The architecture development has been "a noble effort", but King County Metro is concerned about how much work remains to be done in order to truly integrate systems. There is still a major gulf between local/agency-specific approaches and the regional ITS architecture concept.

As transit standards are developed, King County Metro will have a lot of work to do to bring their systems into compliance. Individual projects don't have enough funding to accomplish all of this kind of work that will be necessary.

King County Metro has about 9 systems that are "downstream" of GIS and scheduling software. The people developing standards aren't working at a detailed enough level; they are trying to keep things flexible, but as a result the standards are still too loose; they are not that helpful.

The greatest challenge for small and medium-sized transit agencies like Intercity Transit in implementing technology projects is the lack of staff resources for system integration and on-going operations and maintenance. Individual vendors have products that work well, but none of them sell the complete, integrated package, so a lot of time is spent at King County Metro in keeping the various systems running and working together. There is a lot of theoretically redundant effort but which cannot seem to be eliminated, since the systems are not truly integrated (i.e., formatting and other tasks must be done for each system, and at various stages).

7. **Can you suggest additional people we should talk to about information sharing, technology and transportation? What is their role?**

N/A

The following document contains the “Start-Up” results determined from interviews conducted by TRPC prior to project start:

Summary of ITS Conversations

The comments that follow are primarily drawn from our (TRPC) interviews with local jurisdictional staff. Additional comments are drawn from conversations surrounding the solicitation of ITS grant match funds at the various city council meetings. These are informal comments intended for your background use.

City of Olympia

Dave Riker, Transportation Division Manager (360) 753-8441

Subir Mukerjee, Director of Community Planning and Development (360) 753-8314

Olympia City Council

General Comments:

The technical staff aren’t currently interested in any ITS technologies. It’s going to be a tough sell because they see the issue as immediate needs vs. long-term pie-in-the-sky vision.

Whatever ITS applications are presented, they must clearly translate into benefits on a day to day operational level.

The staff didn’t understand the benefit of this long-range technical plan (ITS Architecture), and were afraid it would lock them into purchasing very specific kinds of technology.

Attractive ITS Technologies:

- Traveler information on the 4th avenue bridge construction project.
- This could include digital cameras with a link to the web or changeable message signs.
- Olympia would also like to make use of the “smart capabilities” of their new parking meters.

City of Lacey

Dennis Ritter, Director of Public Works (360) 491-5600

Martin Hoppe, Transportation Manager (360) 438-2681

Lacey City Council

General Comments:

Lacey is very concerned about losing control of their signal system.

They are cautious about committing any money toward the grant match unless they see a direct benefit to Lacey's road infrastructure.

They are also concerned that by participating in the planning process it will require them to make expensive technological additions to their transportation infrastructure.

Lacey doesn't want to lose their autonomy by entering into an intergovernmental process\plan.

Lacey is also generally concerned about congestion on arterials; the commute North on I-5; and the efficiency of freeway interchanges.

They would like to increase the operational efficiency of their roadways.

Attractive ITS Technologies:

- They have some GIS capability, but they might be interested in more.
- Incident Management
- Air quality measurement equipment
- Regional signal coordination in the future
- Fiber optic in roadways
- Cameras on I-5 Corridor for a Traveler Information System

City of Tumwater

Jay Eaton, Director of Public Works (360) 754-4140

Doug Johnston, Transportation Project Engineer (360) 754-4140

General Comments:

Like all the local operational staff, the concept of ITS technology, much less "ITS Architecture" was difficult for them to understand.

The staff showed at least some interest in the ITS technologies listed below.

Tumwater is generally concerned about congestion on I-5 and Old Highway 99/Capitol Blvd.

They are also interested in increasing the operational efficiency of their roadways, and especially signal efficiency.

Attractive ITS Technologies:

- Signal Coordination (Trosper/Capitol Blvd corridors)
- Expand Emergency Signal Preemption
- Portable Variable Message Signs
- I-5/101 Corridors Traveler Information
- Real-time traffic counts
- R&R Crossing Technology (Maybe)

City of Yelm

Shelly Badger, Planning Director (360) 458-8405

Cathie Carlson, City Planner (360) 458-8405

General Comments:

We must stress the real life benefits of ITS to the city council.

Yelm has many transportation problems and very little money, so they are inclined to be supportive of anything that could possibly help them, as long as it isn't too expensive.

Attractive ITS Technologies:

- Digital Pavement Inventory
- Signal Preemption
- Signal Coordination
- Incident Management
- They get 15000 ADT on SR 510.
- They are the main transportation link for East Pierce County, Lewis County and Southern Thurston County.
- Yelm would be interested in receiving advanced warning from the Tacoma Traffic Management Center on major incidents that impact SR 510.
- Road inventory data
- Freight Data would be useful.
- Flood Warning Systems
- Basic CAD and GIS applications
- Access to geocoded addresses, mapping

Port of Olympia

Nick Handy, Executive Director (360) 586-6150

Andrea Fontenot, Chief Engineer (360) 586-6150

General Comments:

The port seemed genuinely interested in improving regional mobility, and I think they will be a willing participant in the ITS architecture process.

The Port is also concerned about its public relations (They want to improve R&R Crossings).

The port is highly multimodal: ship, barge, raft and truck.

They transport glass, wood chips and logs.

Some of their hopes for ITS are to facilitate maritime transportation; improve freight movement on congested city streets; and increase freight movement from the industrial area around the airport to I-5.

Twenty ships per year come into their docks. Consequently, they don't have much need of GPS based ship tracking, or other highly complicated technologies, but they might be interested in such technologies in the future.

Attractive ITS Technologies:

- The Port is interested in any technologies which will help to decrease traffic congestion, or provide information on alternate routes. Their clients are very concerned about traffic congestion.
- ITS Technologies for Freight
- Highway congestion information
- Weigh in motion
- Traffic Management Center
- Signal Coordination
- Railroad Crossing Technology

Thurston County Roads & Transportation Service

Lester Olson, Director (360) 754-4580

Les Olsen, County Surveyor (360) 754-4580

General Comments:

The county uses advanced technology in their daily operations, and should consequently be less intimidated by ITS than some of the other jurisdictions.

Data security will be a big issue.

Attractive ITS Technologies:

- County Wide Roadway and ROW Inventory
- They currently own a van that can gather time elapsed jpeg data on the county roads system. This data is intended to provide information for pavement management and general documentation (signs, signals, lanes etc.).
- The county would be interested in the potential ITS funds or applications that could facilitate their inventory, storage and analysis of this data.
- Signal Coordination
- Changeable Message Signs
- Surveyors might be interested
- Preplanned Incident Response System
- It would tie in with their emergency management operations.
- AVL
- They are interested in utilizing AVL for fleet management and accountability.
- Warning Systems (flood, ice)
- Traffic Counts

Thurston Geodata Center (TGC)

Andrew Kinney, GIS Manager (360) 754-4594

General Comments:

The TGC is interested in using ITS funds to develop their own data. The TGC is working with County 911 to help them develop a mapped location identifier Computer Aided Dispatch system. They currently provide some mapping support for emergency services, but they don't have real time capabilities. This project might bode well for their participation in the ITS planning process. On the other hand, if they don't see any direct benefit to their data, they may not be interested.

Attractive ITS Technologies:

- Perhaps a comprehensive ITS inventory and data management system could assist with the following needs:
- Funds or hardware that could help them integrate CR-View with the County Roads and Information System (CRIS) Data;
- ITS funds that could assist with finishing the geocoding of addresses to all dwelling units in the county; and
- ITS funds that could assist with standardizing county data, data processing and data maintenance.

Intercity Transit

George Patton, Service Planning Manager (360) 705-5832

Jim Merrill, Operation Manager (360) 705-5832

General Comments:

There seems to be no end to the ITS applications that could be applied to transit. The difficulty may come in getting the other jurisdictions to go along with Intercity Transit's interests.

Their preferred ITS technology would probably be Smart Fair Boxes.

The issue of signal priority for buses is a very sensitive issue, especially with Lacey.

I.T. is not interested in developing as a Traffic Management Center.

Attractive ITS Technologies:

- Pager notification for paratransit and possibly other applications
- Point Deviation Scheduling Technology -- flexible bus stop on demand scheduling.
- Hybrid between Dial-A-Lift and fixed route transit
- Mobile Data Terminals
- Computer aided scheduling and routing
- Video surveillance in buses
- Real Time Bus Arrival Info
- Smart Fair Boxes
- They want to integrate with Central Puget Sound's system
- Permit distance based fares
- Provide lots of data
- ITS Emergency Communications Solutions
- Road condition information would be useful.
- I.T.'s integration with other emergency agencies is crucial.
- Automated Bus Stop Announcement System
- Automated Passenger Counters
- AVL-- it would be nice for paratransit
- Signal Priority Coordination
- Eventually, they may want to provide real time bus info on the web.

Thurston County 911

Jim Quackenbush (360) 704-2731

General Comments:

911 didn't seem terribly interested in the ITS architecture. We don't have much to offer them beside what is listed below. They are already networking on a regional level (Puyallup, RATS, and Pierce County) to purchase a CAD system. Additionally, 911 is working on developing an integrated computer system with the County Justice Network, DOL files, and the Federal Criminal Network.

On the other hand, 911 does participate in emergency management planning with the county. Perhaps the ITS architecture could appeal to this interest.

Attractive ITS Technologies:

- Visual/internet access in vehicles would be nice, but there are data security issues to be addressed.
- Video/Digital Camera Surveillance
- Both fixed cameras and mobile units
- Helicopter video would also be nice.

Tacoma Traffic Management Center (TMC)

Jim Mitchell, Freeway Operation Manager (206) 536-6020

General Comments:

The TMC lives and breaths ITS, and they are happy to educate others about what they are doing.

Attractive ITS Technologies:

- Additional cameras on the I-5 corridor would allow the TMC to expand their range.
- However, cameras won't do anyone any good unless there are fiber optic cables to deliver their image to the TMC or other means of distribution (digital microwave).
- The images derived from the cameras can be utilized to enhance all of the public information services they offer (Internet traveler info, traffic hotline, HAR, VMS, emergency services/incident response dispatch).
- Traveler Information Kiosks at large employment centers.
- They considered a portable wireless video camera, but it was too expensive.

WA State Patrol

Dan Parson, Technology Engineering Section Manager (360) 705-5184

John Bruun, Lieutenant, Field Operations Bureau (253) 536-4302

General Comments:

They appear to be interested and willing participants in the ITS planning process.

Attractive ITS Technologies/Projects:

- They are very supportive of inter-agency communication/cooperation and public outreach/education.
- They would be interested in anything, which could help get data to troopers.
- Sharing the County’s bandwidth
- Short range FM radio broadcast capability for communicating with individuals approaching a traffic jam, or those already in the congestion.
- Traveler Information Signs at 101 and I-5 interchange
- Interactive off-ramp signal metering to increase flow through lights to prevent backup on the Interstate.

Lessons Learned from our Technical Interview Process

What Worked:	What Didn't Work:	Generally Popular ITS Applications
<p>The term “long-term technical plan” instead of architecture; Emphasizing the reasoning behind the federal mandate; and Short-term ITS technologies that are relevant to local government.</p>	<p>The term “ITS Architecture”; Emphasizing the federal mandate; Listing long-term ITS applications that appeared irrelevant; Appearing to “over sell” (desperate); and Confusion regarding “\$1.5 million for planning! No implementation of ITS technologies?”</p>	<p>Traveler Information (7)* Signal Coordination (6) Incident Management (3) GIS Workstations (2 or 3) ITS/Roadway Inventory (3) Traffic Counts (2)</p> <p>* The number indicates how many of the 11 jurisdictions expressed some interest, or could reasonably be expected to show some interest in the particular ITS technology.</p>

Appendix B

Workshop Materials

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WORKSHOP #1 – APRIL 18TH, 2001

Attendance Roster

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**Thurston Region ITS Architecture Project
Workshop Agenda**

**April 18, 2001
8:00 a.m. to 12:30 p.m.
King Oscar's Motel
Lacey, WA**

Workshop Focus:

- **Learn about ITS and Benefits it Provides**
- **Find Out about the Thurston Region ITS Project and What it Means to You**
- **Discuss and Identify Communication Needs and Priorities**
- **Prepare Foundation for Future Project Planning Work**

TIME	ITEM
8:00 a.m.	Pre- Workshop Question and Answer Session • Coffee and Pastries Provided
8:30	Welcome, Introductions and Workshop Overview
8:45	Introduction to ITS and Benefits
9:05	Approach for Developing Thurston Region ITS Architecture
9:20	What We've Heard from Discussions with ITS Stakeholders • Group Discussion on Other Perspectives
10:25	Break
10:35	Small Group Discussions • Operational Strategy: Roles and Responsibilities • Identify Priorities and Needs • Summarize and Report Findings Back to Group
12:20 p.m.	Wrap Up, Action Items, Next Steps • Lunch Available

Workshop #1 – April 18th, 2001

THURSTON REGION ITS ARCHITECTURE PROJECT IN BRIEF

What is the Thurston Region ITS Architecture Project? And what is an ITS Architecture?

The Thurston Region ITS Architecture Project is a TRPC sponsored effort that will identify agreements and standards for the integration of new Intelligent Transportation Systems (ITS) elements, and lead the way for the interoperability of regional systems. An important requirement of this project is to refine the regional architecture in the transit area to generate a detailed transit architecture.

The Thurston Region ITS architecture will be a common framework for planning, defining and integrating ITS on a region-wide basis. It could also be tailored to address specific local needs and could include the subsystems, agencies and information flows relevant to the area.

Why is it needed?

A regional ITS architecture is required to complete the blue print for development of a fully integrated and interoperable ITS infrastructure.

While the development of an ITS planning element is a regional need, there are also federal provisions in the Transportation Equity Act for the 21st Century (TEA-21) that require ITS projects carried out with federal transportation funds be in conformance with the National ITS Architecture and Standards. Under federal guidance, the TRPC has responsibility to ensure this conformance for regional projects.

And not to be overlooked are the significant operational and cost efficiencies gained through the development and promotion of ITS.

How will a regional ITS architecture be developed?

The first task will be to capture what ITS work has already been done, and identify any needs that should be incorporated into the planning process through discussions with key ITS stakeholders. From this effort, a regional inventory will be created that will form the basis for developing a regional architecture.

All the pieces will then be pulled together by mapping regional needs to the National ITS Architecture; identifying, defining, and integrating auxiliary regional elements; and finally, developing regional connectivity and architectural flows. It's expected the regional ITS architecture will be completed in the fall of 2001.

How can you participate?

The project needs the involvement of key ITS stakeholders with an interest in building support and consensus for a regional ITS architecture. By participating in a series of workshops we have planned over the coming months, you can help us identify ITS needs and requirements and provide input into the ITS planning process to make sure the architecture integrates regional modal and organizational needs.

WORKSHOP #1 – APRIL 18TH, 2001

The following are the briefing slides used in TRPC Workshop #1. They are also available in their native PowerPoint format as file: ***Complete Presentation 1***.

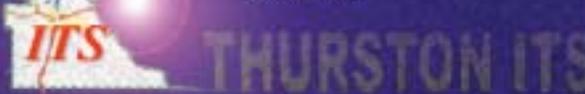
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Thurston ITS Architecture Workshop

Introduction to ITS System Architecture & Benefits

Presented to
Thurston Regional Planning Council
by
Jeff Jenq

April 18, 2001



Expected Benefits of ITS

- **Traffic Management**
 - Throughput increased, congestion and delays reduced, emissions reduced
 - 1. fuel & pollution savings through reduced delays/standing
 - Freeway capacity improved with ramp metering (10%-30% in Seattle)
 - Crash rates down 28% with ramp metering (Seattle)
 - Emergency response times cut -60% (Atlanta)
 - Fuel consumption down 6%, hydrocarbons down 10%, carbon monoxide down 12%, ... (Abilene, TX)
- **Traveler Information**
 - Better informed traveler, commuter, commercial operators; can influence & change travel patterns
 - 100k daily "hits" on traffic status (Seattle)
 - 62% used would make alternate plans (Atlanta)
 - 88% changed travel plans based on traveler info (Minneapolis)
- **Transit Management**
 - Promote transit as modal choice option; reduce uncertainty, enhance ridership
 - AVE buses 23% better on-time performance (Baltimore)
 - Travel time reduced by 5%-8% (Portland)
 - On-time performance improved 12%; reduction in number of buses 9% (Kansas City)
 - Estimated Medicaid savings \$11M with coordinated on-demand transit for the elderly (Florida)

ITS – the Evolution



1985 1990 1995 Now

Planning/Study
Field Operational Test
Deployment
Atlanta MDI
CVISN
Architecture Development
Standards Development

Transportation Planning NPRM
Project Development NPRM
FTA National ITS Architecture Consistency Policy

ITS Architecture in a Nut Shell

- **System Engineering Approach for Planning, Designing and Implementing ITS**

Example of PCs

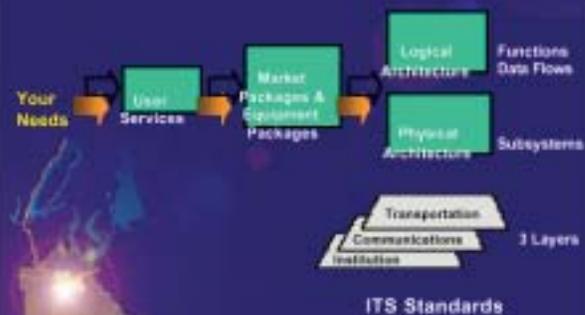
- Functional Specifications
- Physical Specifications
- Standards

Architecture Does NOT Specify Technologies

What is Addressed by ITS

- Traffic Management
- Incident Management
- Traveler Information
- Public Transportation Management
- Electronic Payment
- Commercial Vehicle Operations
- Emergency Management
- Advanced Vehicle Safety Systems
- Information Management
- ITS in Rural Areas

ITS Architecture Overview



Your Needs → User Services → Market Packages & Equipment Packages → Logical Architecture (Functions, Data Flows) → Physical Architecture (Subsystems)

ITS Standards: Transportation, Communications, Institution (3 Layers)

Intended Benefits

- ITS Architecture
 - Use Common Language
 - Provides a Framework
 - Integration between ITS Systems
 - Institutional Coordination
- Standards
 - Interoperability
 - Integration

Rationales

It's not Just a Good Thing to Do..
But Something that We Have to Do.

Time Before ITS Architecture

- Proprietary Systems and Piece Meal Developments
 - Non-interoperable
 - Non-interchangeable
 - Non-expandable / Lack of Support
 - Difficult to Integrate with Other Systems
- Lack of Jurisdictional Coordination

Information

- National ITS Architecture CD
- National ITS Training Course
- FHWA and FTA Websites
- ITS America Website
- ITE Web Site
- Mr. Don Creighton (Battelle)

Making Differences

- Metropolitan ITS Deployment
- CVO
- Rural ITS
- Transit ITS Planning
- Transit Smart Bus Concept and Standards

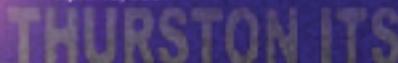
Thurston ITS Architecture Workshop

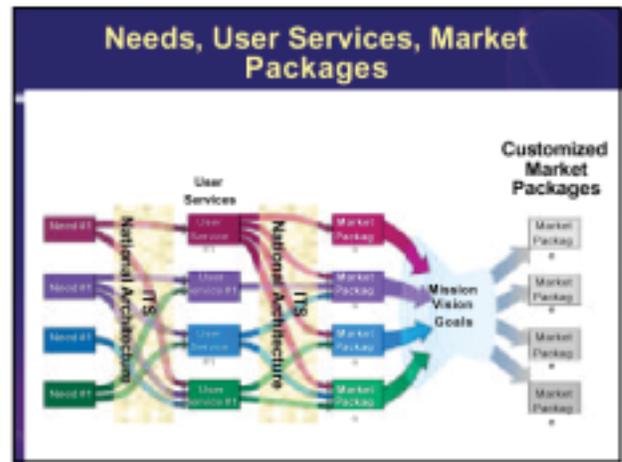
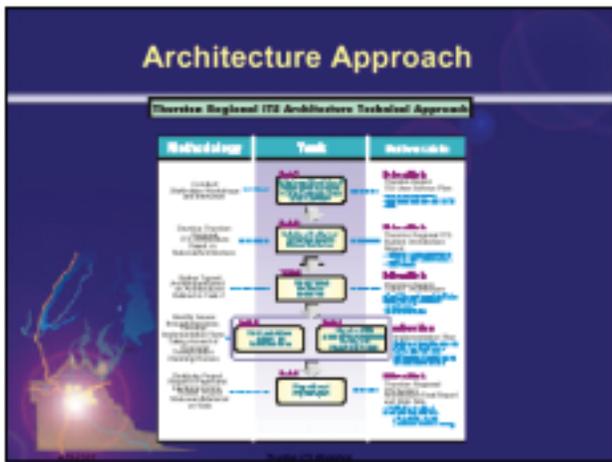
Thurston ITS Architecture Development Approach

Presented to
Thurston Regional Planning Council
by
Mala Raman



April 18, 2001



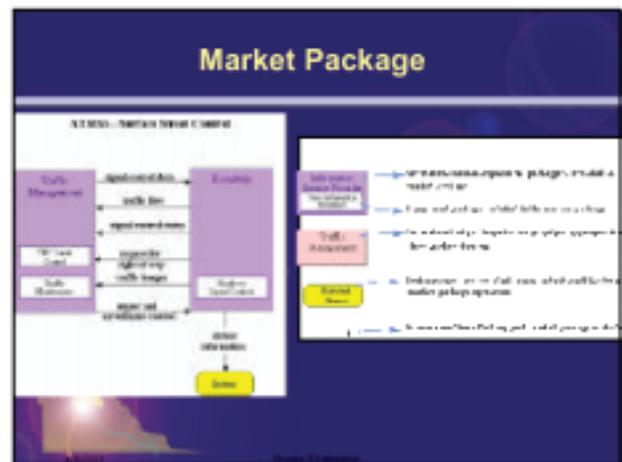


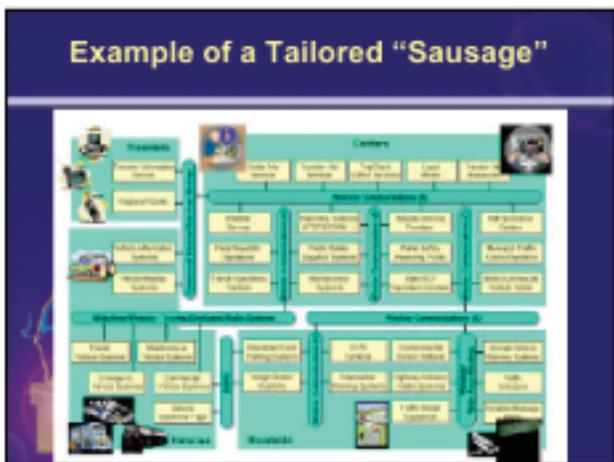
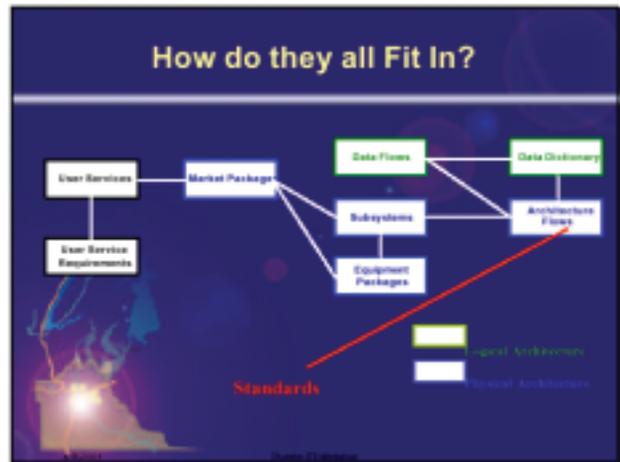
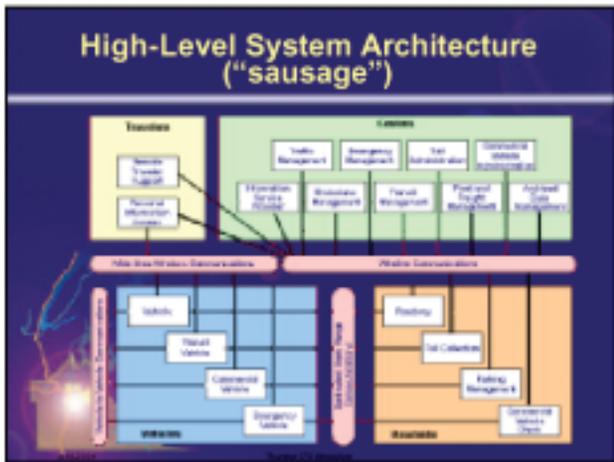
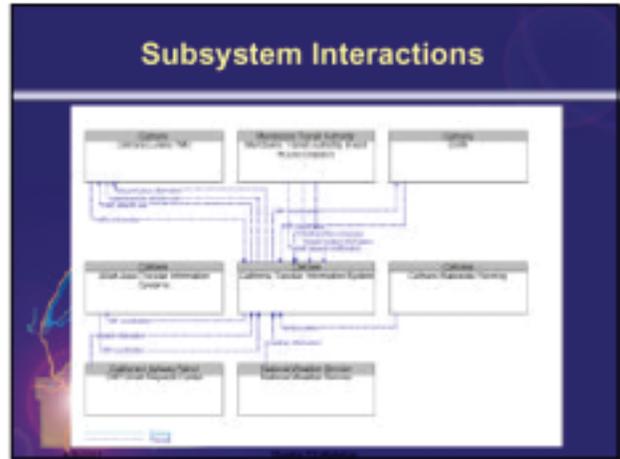
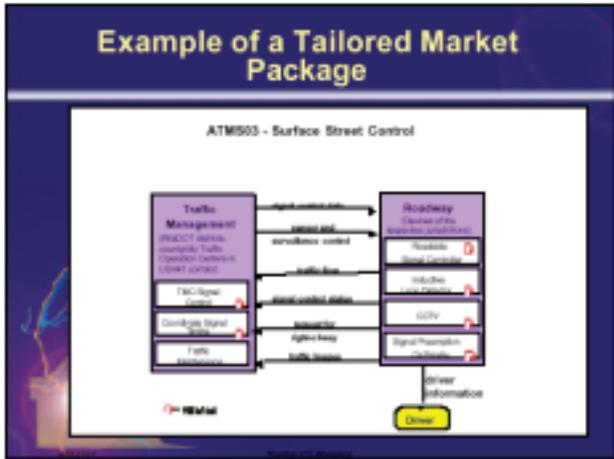
- ### User Needs, User Services, User Service Requirements
- User Services convert the stated User Needs into Compliant National ITS Architecture terms
 - 31 Generic User Services identified in 6 bundles:
 - Traffic and Traffic Management
 - Public Transportation Management
 - Electronic Payment Services
 - Commercial Vehicle Operations
 - Emergency Management
 - Advanced Vehicle Safety Systems
 - Information Management
 - User Services are further decomposed into User Service Requirements



Needs to User Service Mapping

USER SERVICES	PROBLEMS/NEEDS																														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
1. Traffic and Traffic Management																															
2. Public Transportation Management																															
3. Electronic Payment Services																															
4. Commercial Vehicle Operations																															
5. Emergency Management																															
6. Advanced Vehicle Safety Systems																															
7. Information Management																															





Refined Transit Architecture

- Develop a Detailed System Architecture for Intercity Transit
 - Build upon the Thurston Regional System Architecture
- Identify some “Early Winner” Transit ITS Projects

Workshop Overview

- [Pre-Workshop Q & A – “The Basics”]
- Welcome
- Introduction to ITS and Benefits
- Approach—Developing the Thurston Regional ITS Architecture
- *What We’ve Heard from You*
- Small Group Discussions
- Wrap Up—Action Items, Next Steps

Implementation Plan

- Identify Issues Related to the Planning and Deployment of ITS Architecture in the Thurston Region
 - Identify and Evaluate ITS Projects
 - Identify a process for continued regional cooperation and planning
 - Integrate ITS with other traditional transportation projects

Thurston ITS Architecture Workshop

Summary of Stakeholder Interview Results



Final Report

- Compile the Deliverables from:
 - Task 1: Workshop Results, User Needs, User Services, and User Service Requirements
 - Task 2: Thurston Regional System Architecture
 - Task 3 and 5: Implementation Plan
 - Task 4: Refined Transit Architecture

Objectives

- Gain understanding of the issues and work program
- Identify issues or needs that should be incorporated into the planning process
- Start building support and consensus for a regional architecture

Stakeholder Areas

- Freight and Commercial Vehicle Operators
- Traffic Systems Managers
- Emergency Response Coordinators
- Regional Transit Providers
- Advanced Traveler Information

Key Questions

- How can ITS solutions better facilitate the movement of people and freight?
- What are stakeholder visions for incorporating ITS into a regional architecture?
- What are some of the barriers they encounter in achieving this vision?
- How can the TRPC facilitate the development of a common framework for ITS in our region?

Overall Approach for Transit:

- Focus on transit-non-transit interactions in Thurston County
- Focus on external transit-transit interactions and partnering opportunities
- Separate/supplemental transit stakeholder meetings/workshops
- Initial transit stakeholder kick-off February 26
- Build upon and integrate with Puget Sound architecture

Discussion Highlights: Traffic Systems

- Signal coordination is primary ITS tool
- Many informal communication structures in place; works fairly well
- Needs:
 - Information and solutions for traffic diversions off I-5
 - Road closure information
- Major issues: Limited resources and use of technology

Interviews Conducted So Far

- | | |
|------------------------------|----------------------------|
| • City of Yelm | • WSDOT ITS |
| • City of Tumwater | • Fort Lewis Emergency Ops |
| • WSDOT Traffic & Freeway | • Intercity Transit |
| • WSDOT ACCT | • Sound Transit |
| • WSDOT Public Trans. Office | • Pierce Transit |
| • Port of Olympia | • King County Metro |
| • Washington Trucking Ass. | • Twin Transit |
| • Thurston County | • Grays Harbor Transit |
| • Puget Sound and Pacific RR | |

Discussion Highlights: Traffic Systems

- WSDOT Olympic Region: fully capable Traffic Operations Center in Tacoma
 - Limited area of surveillance and traffic detection
 - Communications challenges
 - Have pre-planned alt routes w/Olympia & Lacey
 - Collocated and use WSP CAD for incidents
 - Send regional data to WSDOT web site for traveler info
- Needs:
 - Added/extended traffic detection & surveillance on I-5 & 101 in Thurston
- Major issues:
 - Have problem spots—need surveillance
 - Communications used microwave—not always best suited

Discussion Highlights: Traffic Systems (Roads)

- Thurston County Roads & Transportation Services
 - Roadway maintenance and transportation services for all type vehicles
 - State of the art surveying & GIS divisions
 - Portable roadside equipment—no permanent
 - ~6 signalized intersections—operation is contracted
 - Flood sensors; 911 Call-Center & EOC
 - No real-time data; use fax, email, phone, radios & mail
- Needs:
 - Vehicle on-board systems (GPS, data terminals, "measure & quantity")
 - Resource management system (e.g., vehicles, consumables)
- Major issues:

Incident/Emergency Response Mgmt

- WSP, WSDOT, County & Ft. Lewis involved
 - WSP is "Scene Command" (by law); has CAD system
 - WSDOT uses WSP CAD & has IRT vehicles that respond
 - County has 911, EOC, flood sensors & incident response expert
 - Ft. Lewis provides MSCA & "good neighbor" policy
- Needs:
 - Integrated regional weather (rWeather?)
 - Emergency vehicle signal preemption?
- Major Issues:
 - Communications dead spots (e.g., cell, radio)
 - Ft. Lewis as major employer, landowner & municipality of 50K

Discussion Highlights: Freight

- Minimal use of ITS technologies now; cell phones primary communication tool.
- Needs:
 - Signal priority
 - Accessible internet-based information
 - Real time roadway and weather information
 - Rail improvements to increase speed
 - Weigh station by-pass technologies
 - Web-based permitting
 - Computers in trucks; text messaging
- Major issues: proprietary information and costs to implement ITS solutions

Discussion Highlights: Traveler Information

- WSDOT Olympic Region:
 - Contributes regional I-5, US and SR traffic data and images to WSDOT web site (e.g., "the Flow Map") for traffic and incidents
 - Has 1-800 for traffic and pass info; dedicated web site for pass conditions & roadway images
- Needs:
 - (as mentioned elsewhere) data for I-5 and other key locations not presently included
 - Integrated data/info for the region; sources at WSDOT, county, cities, ...
 - rWeather?
- Major Issues:

Discussion Highlights: Freight

- Puget Sound & Pacific RR
 - Observes the "10-minute rule" with trains of 45-60 cars
 - Does not serve Port of Olympia (but partners do)
- Needs:
 - More efficient switching for access to Port of Olympia
 - More up-front involvement in regional policies affecting freight mobility
 - Integrated regional weather (rWeather?)
- Major Issues:
 - Future of the Port of Olympia—growth?
 - Policies that best serve the community in concert with freight mobility and rail access

Transit Background:

- Intercity Transit (IT) only public provider in Thurston County
- Limited interaction with neighboring transit agencies, except Pierce County
- Pierce County Transit is physical link between IT and Sound area
- Loss of transit funding (Motor Vehicle Excise Tax)

Discussion Highlights: Regional Transit Systems

- Limited technology in Thurston County and most neighbors; relatively advanced in Puget Sound area (incl. Pierce Co.)
- Needs:
 - Management tools (software, vehicle tracking)
 - Communications infrastructure
 - Construction information
- Major issues: loss of MVET funding; initial backbone investments are invisible; staff resources

Other Perspectives?

- What's missing?
- How can ITS solutions better facilitate the movement of people and freight?
- What are your visions or needs for incorporating ITS into a regional architecture?
- What are some of the barriers you encounter in achieving this vision?
- How can the TRPC facilitate the development of a common framework for ITS in our region?

TELECONFERENCE FOR WORKSHOP #2 – JULY 11TH, 2001

The following are the briefing slides used for the preliminary teleconference discussions prior to TRPC Workshop #2. They are also available in their native PowerPoint format as files: *Thurston Focus Conference Call – Traffic*, *Thurston Focus Conference Call -- Emerg Resp Inc Mgmt*, and *Thurston Focus Conference Call – Transit*.

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TRPC Focus Teleconference – Traffic & Info Management



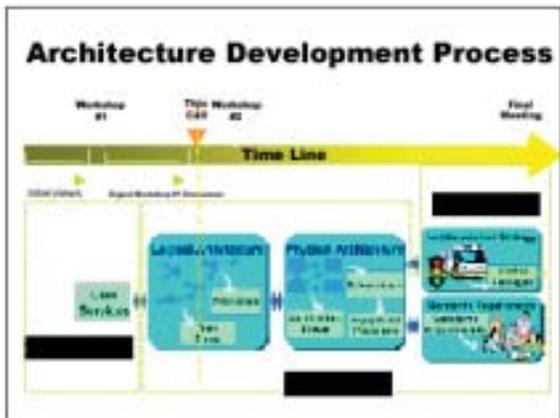
Today's Agenda

- Quick introductions of participants
- Review of activities to date
- Solicit the Inventory Forms
- Brisk walk through the User Needs
- Emerging strategies to be reflected in the regional system architecture
- Next Steps

Project Overview

- Develop a plan for Thurston Region to:
 - Facilitate implementation of technologies by transportation and related organizations.
 - Foster inter-modal and inter-jurisdictional problem solving, utilizing technology.
- Document the plan in a "System Architecture"

Review of Activities To Date



Needs Identification in:

- Traffic
- Traveler Information

Traffic

Review of User Needs - City (1 of 2)

Regional Cities

- Need CCTV images of construction sites (e.g., # Avenue Bridge).
- Need to reduce congestion on arterials.
- Need to improve the efficiency of freeway interchanges.
- Need to reduce congestion on Old Highway 99 and Capital Blvd.
- Need to improve signal timing efficiency.
- Need to improve the operational efficiency of roadways (e.g., city and county).
- Need signal coordination on corridors (e.g., Trooper, Capital Blvd, etc.) and other key roadways.
- Need to improve safety and efficiency of freight mobility on congested city streets.

Traffic

Review of User Needs - City (2 of 2)

Regional Cities (continued)

- Need to increase the capacity, safety and efficiency of freight mobility from industrial area around the airport to I-5.
- Need to decrease traffic congestion in and around the Port of Olympia.
- Need to cooperatively manage any alternate routing traffic surges on city streets due to I-5 closure—in some cases there are no parallel alternate routes.
- Need to resolve any traffic signal system incompatibilities to enable coordinated operations between adjacent jurisdictions (e.g., Olympia & Lacey).
- Need to improve safety and traffic control measures at interface between rural (unsignalized) and urban (signalized) roadway systems.
- Need to include pedestrian information (e.g., presence of large crowds) in traffic control planning and operations, and incident response and management.

Traffic

Review of User Needs - County

Thurston County

- Need to improve the operational efficiency of roadways (e.g., city and county).
- Need flood warning systems (e.g., specialized and location-specific incident detection).
- Need to have monitoring and early warning systems for flood, ice, weather, etc. (e.g., KWIS7).
- Need to use digital mapping and inventory to enhance 911 dispatch (e.g., CAD).
- Need to get weather at spot locations in the county.
- Need communications alternative to cell phones and radio due to dead spots in the county.
- Need a resources management system for (county) vehicles, consumables, etc.
- Need to collect data on snow and ice treatment and removal – time and location data.
- Need to have automatic vehicle location (AVL) on the county vehicles for better management of resources and to enhance CAD.

Traffic

Review of User Needs - State

Washington State DOT

- Need to reduce commute times, reduce congestion on I5 North from Thurston.
- Need to improve the efficiency of freeway interchanges.
- Need traffic CCTV on I-5 corridor in Thurston.
- Need additional CCTV for traffic surveillance along I-5 in Thurston.
- Need traveler information for the I-5 and US 101 corridors.
- Need to extend traffic surveillance coverage to include (at least) I5 at US 101, I-5 at City Center (165) and 101 at Black Lake.
- Need to extend our (state) traffic surveillance south along I5 through Thurston County.
- Need to deliver additional driver information targeted at Thurston region (e.g., DMS, HART).
- Need to increase the efficiency and safety of high-speed passenger rail—there are several at grade crossings.
- Need to expand coverage for regional transportation system status (e.g., additional HART).

Traffic

Review of User Needs – Regional Integration (1 of 3)

Integration of Regional Traffic Control and Management Needs

- Need traveler information on construction projects available on the web (location, text, images) or changeable message signs (location, text).
- Need to improve incident detection, response and management.
- Need regional signal coordination and shared control capabilities but retain local control as needed.
- Need expanded and enhanced signal preemption for emergency vehicles.
- Need additional portable message signs.
- Need real-time traffic counts (e.g., I5, 101, selected city and county roadways).
- Need to improve roadway/rail crossing technologies to reduce traffic delays.

Traffic

Review of User Needs – Regional Integration (2 of 3)

Integration of Regional Traffic Control (continued)

- Need a complete digital pavement inventory, geo-coded addresses and mapping (e.g., county-wide roadway, ROW inventory).
- Need mutually enhanced incident notification and incident status interchange between state, county, and all cities (e.g., SR 103, etc.).
- Need inter-agency communications and cooperation (e.g., WSP, state, county, city, 911, etc.).
- Need adaptive off-ramp signal timing to optimize the traffic flow off the I-5 and prevent backups.
- Need to develop and use a regional digital inventory of transportation assets (e.g., roadways, signals, etc.).
- Need to improve on-route driver information in the region.
- Need to “formalize” the collection and dissemination of regional data and derived information for normal and exceptional operations.

Traffic

Review of User Needs – Regional Integration (3 of 3)

Integration of Regional Traffic Control and Management Needs (continued)

- Need to better communicate and coordinate among centers.
- Need to provide local data and information to state for integration in Puget Sound regional status but also need to maintain capability to respond to local inquiries (e.g., from media, smaller local agencies, concerned parents, etc.).
- Need to collect and integrate all sources of transportation systems status data (e.g., cell phone reports, probe vehicles such as agency maintenance vehicles, law enforcement, garbage collectors, etc.).
- Need to have a supply of portable message signs available for city and county uses in exceptional conditions.
- Need to optimize traffic flow at I-5 interchanges (e.g., ramp metering, adaptive signal timing).
- Need enhancements to regional communications infrastructure (e.g., "Light Lane" fiber on I-5 corridor).

Traveler Info

Review of Traveler Information User Needs (1 of 2)

- Need to provide traveler information on alternate routes to and from the Port of Olympia.
- Need to provide traveler and commercial freight operators with roadway congestion information.
- Need a regional Smart Card system (e.g., transit, ferry, toll bridges, Central Puget Sound).
- Need a regional trip planner capability coordinated with all of Puget Sound region.
- Need accurate, integrated, near real-time regional weather conditions and forecast.

Traveler Info

Review of Traveler Information User Needs (2 of 2)

- Need integrated state, county and city traveler information for the region.
- Need tailored traveler and system status information for use by the school districts, their transportation systems, the students and their parents.
- Need to provide local data and information to state for integration in Puget Sound regional status but also need to maintain capability to respond to local inquiries (e.g., from media, smaller local agencies, concerned parents, etc.).
- Need traveler information kiosks at large employment centers (e.g., state capital).

Strategies to be reflected in the Regional System Architecture

Traffic

Emerging Strategies to be Reflected in the Regional System Architecture

- Regional traffic surveillance
 - Construction sites (CCTV, portable message sign)
 - I-5 and US 101 (CCTV, detector)
 - Traffic detectors on arterial streets
 - Use of probe vehicles for reporting road status (e.g., public vehicle, WSP, garbage trucks, etc.)
- Regional traffic management
 - Information sharing betn City, County and WSDOT
 - Develop traffic control strategies for different scenarios (e.g., I-5 closure/detour, incident on major arterial)
 - Interchanges (adaptive off ramp signal and coordination with arterial street, ramp metering, CCTV)
 - Corridor-based (cross-jurisdictional) signal coordination (with optional support to emergency vehicle preemption)
 - Portable message signs for City and County (for normal traffic events and exceptional conditions)
 - Expanded traffic management on I-5 (CMS, HAR)

Traffic

Emerging Strategies to be Reflected in the Regional System Architecture

- Other roadway implementations
 - Environmental sensors (flood, ice, etc)
 - Rail crossing warning system
- Regional Resource management
 - GIS-based resource management system (related to CAD for E911)
 - AVL for selected public vehicles
 - Collect snow removal/treatment data with on-board instrumentation
- Regional communication systems
 - Backbone ("Light Lane" fiber optics along I-5)
 - Wire-line (T1, ISDN, DSL, Cable Modem, twisted pair, telephone)
 - Wireless (County radio, WSDOT radio, Cell, etc.)

Traffic

Emerging Strategies to be Reflected in the Regional System Architecture

- Transportation planning related issues
 - Roadway capacity improvement
 - Certain freight related traffic issues
 - Data compatibility and archiving
 - Common GIS map database

Traveler Info

Emerging Strategies to be Reflected in the Regional System Architecture

- Traveler information data collection
 - Collect regional transportation system status data
 - Construction information (all jurisdictions)
 - Traffic and environmental sensor data
 - Traffic management data (e.g., suggested alternative routes)
 - Incident reports (Motorists, WSP, E911, etc.)
 - Probe vehicles (maintenance, WSP, garbage trucks)
 - Private traffic reporting services (e.g., helicopters)
 - Weather Services
 - Collect multimodal transportation data (e.g., transit, ferry, etc.)
 - Transit schedule including transfers
 - Ferry schedule
 - Parking lot status

Traveler Info

Emerging Strategies to be Reflected in the Regional System Architecture

- Information fusing
 - Traveler information data server
 - Interfaces with other systems
 - Processes and stores data in a central database
 - Allows manual data input
 - Includes algorithms for processing user inquiries (e.g., itinerary planning)
 - Distributes information to different services
 - Human-assisted data fusing process –require dedicated staff
 - Possible partnership with private information Service Providers (ISP)
 - Integration with Puget Sound region

Traveler Info

Emerging Strategies to be Reflected in the Regional System Architecture

- Traveler information dissemination
 - Freight operators - Web, fax, pager, touch tone phone, kiosk or message signs at truck terminal, etc.
 - Construction
 - Weather related closures
 - Congestion
 - Incident
 - Alternative route
 - Weather
 - School districts, bus operators, students, and parents – Web, fax, pager, touch tone phone, etc.
 - Tailored traveler, weather and road system status information

Traveler Info

Emerging Strategies to be Reflected in the Regional System Architecture

- Traveler information dissemination (cont'd)
 - General public – Web, TV, radio, fax, pager, kiosk, public display device, etc)
 - Construction
 - Weather related closures
 - Congestion
 - Incident
 - Alternative route
 - Regional (multimodal) trip itinerary

Next Steps

- Workshop: July 25
 - Further develop strategies
 - Discuss implementation steps, including obstacles
- Draft report in August
- Final stakeholder meeting(s) in September

TRPC Focus Teleconference – Emergency Response & Incident Management



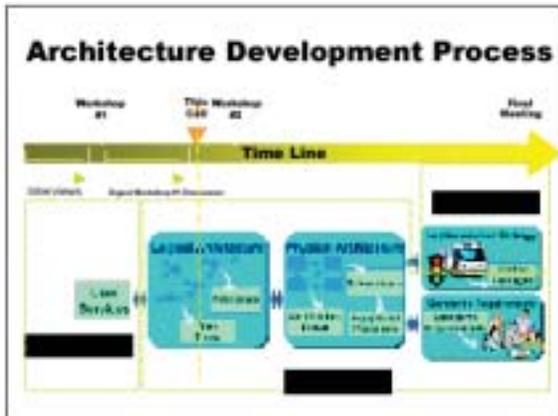
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Review of Activities To Date



Needs Identification

Incident/Emergency Response & Management

Review of Incident/Emergency Response & Management User Needs (1 of 3)

- Need to have a pre-planned incident response system.
- Need on-scene and en-route video data link from vehicles to E911 center, also internet access from vehicles.
- Need fixed and mobile CCTV surveillance and digital camera for emergency response and incident management (e.g., on-scene status reports with pictures or video).
- Need inter-agency communications and cooperation (e.g., WSP, state, county, city, 911, etc.).
- Need short-range FM broadcast for localized traveler information, traffic control and incident management.

Review of Incident/Emergency Response & Management User Needs (2 of 3)

- Need traveler information signs at I-5/101 interchange.
- Need to know the real-time status of regional trauma centers: St. Peters and then Madigan.
- Need to know traffic and road weather conditions affecting major regional employers (e.g., capital, Ft. Lewis).
- Need to improve centralized situation data collection and information dissemination during a crisis or unusual circumstances (e.g., earthquake, flood, I-5 closure, etc.).
- Need to improve real-time access to situation data for fire and EMS response (e.g., mobile data terminals?).
- Need to "formalize" the collection and dissemination of regional data and derived information for normal and exceptional operations.

Review of Incident/Emergency Response & Management User Needs (3 of 3)

- Need to better communicate and coordinate among centers.
- Need to have KGY (regional emergency radio broadcast) and TCTV (regional TV alert) actively involved and informed in status of all transportation systems – especially during exceptional conditions.
- Need to cooperate with higher regional agencies (e.g., state, Camp Murray) in the sharing of local operational, incident and emergency response status data and information.
- Need to have AVL on incident and emergency response vehicles to minimize the "where are you" radio and cell phone chatter.
- Need to have a supply of portable message signs available for city and county uses in exceptional conditions.

Strategies to be reflected in the Regional System Architecture

Emerging Strategies to be Reflected in the Regional System Architecture

- Center-to-Center
 - Coordinated incident response and management procedures
 - Electronic data exchange between agencies (WSP, State, County, City, 911, etc.)
 - Computer-aided incident response system
 - Recommend pre-planned procedures and check list
 - Manage and locate resources
 - Track response status
 - Facilitate communications
 - Communication patches between agencies
 - Data access to the status of regional trauma centers
 - Access to CCTV for emergency response
 - Data/Information central for crisis
 - Improved coordination with regional emergency broadcast system

Emerging Strategies to be Reflected in the Regional System Architecture

- Roadway Implementation
 - Portable message signs
 - Portable HAR (short-range FM broadcast)
 - Permanent changeable message signs at I-5 and US101
- Vehicle Implementation
 - AVL for all emergency response vehicles
 - Mobile Data Messaging system (e.g., MDT) for fire and EMS
 - Digital image or video from emergency response vehicle

Next Steps

- **Workshop: July 25**
 - Further develop strategies
 - Discuss implementation steps, including obstacles
- **Draft report in August**
- **Final stakeholder meeting(s) in September**

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TRPC Focus Teleconference – Transit

Thurston Regional ITS Architecture Development

Stakeholder Conference Call

Transit

Thurston Regional Planning Council



July 11, 2001

Project Overview

- Developing a plan for Thurston County to:
 - Facilitate implementation of technologies by transportation and related organizations
 - Foster inter-modal and inter-jurisdictional problem solving, utilizing technology
- Document the plan in a "System Architecture"

Today's Agenda

- Introduction
- Review of Activities To Date:
 - Intercity Transit - Needs Identification
 - Intercity Transit - Emerging Strategies to be Reflected in the System Architecture
- Discuss needs and potential applications for:
 - special needs transit
 - school bus
 - rideshare
- Next Steps

Review of Activities To Date

Intercity Transit Needs Identification

Review of Transit User Needs -- Intercity Transit --

- Need to make fare payment more convenient, increase reliability, reduce handling costs, support integration with Puget Sound area systems and collect more data
- Need to make schedule and route information more accessible, trip planning easier, schedule updates more efficient, reduce uncertainty about arrival times and stops, and make telephone info system more efficient

Review of Transit User Needs -- Intercity Transit --

- Need to increase the efficiency of paratransit ride confirmation call back process, reduce inefficiencies from ride cancellations, better serve same-day trips, improve scheduling/run-cutting process, better coordinate with special needs services, and improve fare accounting processes

**Review of Transit User Needs
-- Intercity Transit --**

- Need to facilitate transfers between IT routes and to other services
- Need to improve schedule adherence and ability to maintain spacing/headways
- Need to improve detection and response to security incidents on vehicles and at transit centers

**Review of Transit User Needs
-- Intercity Transit --**

- Need to reduce delays, and reduce safety risks, associated with traffic conditions, including signal delays, incidents, weather/pavement conditions and road construction
- Need to efficiently serve lower density areas (suburban and rural)

**Review of Transit User Needs
-- Intercity Transit --**

- Need to improve the efficiency and effectiveness of planning functions, including: data collection and analysis, public outreach, reporting and data archiving
- Need to enhance preventative maintenance, capabilities and improve inventory functions

Review of Activities To Date

Intercity Transit -- Emerging Strategies to be Reflected in the System Architecture

**Emerging Strategies to be Reflected in the Regional System Architecture
-- Intercity Transit --**

Highest Priority (Draft)

- New, more sophisticated fare boxes capable of integration with Puget Sound Region "smart card system".
- Automated traveler information system, capable of integration with Puget Sound Region system, capable of itinerary planning and accessible by phone, internet and possibly kiosks.
- Automated passenger counters.

**Emerging Strategies to be Reflected in the Regional System Architecture
-- Intercity Transit --**

- Vehicle tracking (AVL) system w/mobile data communications system), capable of supporting automated schedule adherence monitoring and enhanced transfer coordination.
- Mobile data terminals (paratransit first)
- Software system upgrades for scheduling/run-cutting.
- Automated on-board annunciators and/or displays

Emerging Strategies to be Reflected in the Regional System Architecture -- Intercity Transit --

Secondary Priorities (Draft)

- Real-time bus arrival estimates at major stops and via telephone and internet
- Traffic signal priority (conditioned by vehicle schedule status)
- On-board and transit center security monitoring
- Two-way data sharing and enhanced incident coordination with traffic management center(s)

Emerging Strategies to be Reflected in the Regional System Architecture -- Intercity Transit --

Secondary Priorities (Draft)

- "Smart shuttle" or flex-route service using AVL and other technologies
- Enhanced vehicle monitoring
- Driver monitoring

Special Transit, School Bus and Rideshare

Needs and Possible Technology Strategies

Special Need/Community Transit: -- Possible Needs --

- Need to reduce inefficiencies resulting from uncoordinated, sometimes redundant special needs transit service (e.g., different agencies serving the same trips).
- Need to stretch resources by sharing assets among special needs transit operators, such as reservations systems, scheduling and dispatch systems, or vehicles.

Special Need/Community Transit: -- Possible Needs, cont. --

- Need to improve connections between special needs transit services and public paratransit services in order to serve unmet client travel needs.
- Need to improve connections among different special needs transit services in order to serve unmet client needs.
- Need to provide transit service in rural areas where public transit service has been eliminated.

Special Need/Community Transit: -- Possible Needs, cont. --

- Need to improve accounting processes to speed payments to providers.
- Need to improve the efficiency of the trip reservation and confirmation process.
- Need to improve client's access to information on other transit services.

-- Possible School Bus Needs --

- Possible Regional Ridesharing Needs --

- Need to reduce potential safety/security concerns associated with ridesharing.
- Need to reduce potential reliability concerns associated with ridesharing.
- Need to improve travel time competitiveness/advantage for carpoolers
- Need to reduce costs associated with maintenance/update of regional rideshare databases

-- Possible Regional Ridesharing Needs, cont. --

- Need to improve same-day flexibility for itinerary changes for carpoolers.
- Need to improve awareness of carpooling as an option and how to participate.

Possible Strategies for Special Needs, School Bus and Rideshare

- Integrated smart card fare payment/tracking (transit + other social service)
- Special needs paratransit resource sharing/coordination (reservation systems, vehicles)
- Utilization of school buses for non-student transportation
- Integrated trip planning system(s)
- Same-day dynamic rideshare system
- Others???

Next Steps

- Workshop: July 25
 - Further develop strategies
 - Discuss implementation steps, including obstacles
- Draft report in August
- Final stakeholder meeting(s) in September

WORKSHOP #2 – JULY 25TH, 2001

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Workshop #2 – July 25th, 2001

**Thurston Region ITS Architecture
Workshop #2**

**1:00 – 4:00 PM
Wednesday, July 25, 2001
Olympia Center**

- 1:00 – 1:30** **Introduction**
- Welcome and Introductions
 - Purpose and Approach for Today's Workshop
 - Overall Project Purpose and Approach
- 1:30 – 2:30** **Review of Draft Thurston Regional ITS Architecture**
- Development of Thurston ITS Architecture
 - Review and Discuss Draft Thurston ITS Architecture
 - Identify Key Issues and Concerns
- 2:30 – 2:45** **Break**
- 2:45 – 4:00** **Identification of Regional Strategies for Advancing the ITS Architecture**
- Identify and Discuss Actions to Support the Regional Architecture
- 4:00** **Adjourn**
- Review Action Items and Next Steps

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Workshop #2 – July 25th, 2001

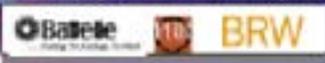
The following are the briefing slides used in TRPC Workshop #2. They are also available in their native PowerPoint format as file: ***Complete Presentation 2***.

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Thurston Regional ITS Architecture Development

Overall Project Purpose & Approach

Thurston Regional Planning Council



July 25, 2001



Overall Project Purpose

- What is "an Architecture?"
 - Is: vision, framework, guideline, roadmap, strategy, descriptive
 - Is not: mandate, prescriptive
- How do architectures work?
 - Develops a process for outreach & engagement of stakeholders, for gaining consistency and support
 - Identifies the "components" which are (most likely) the projects needed to achieve the build
 - Identifies the strategy for sequencing investments, prioritizing work
 - Used as the "blueprint" for building the regional ITS

The National ITS Architecture & Standards Program Framework



- **Logical**
 - User Services
 - Process Specifications
 - Logical Data Flows
 - Data Dictionaries
- **Physical**
 - Subsystems
 - Market Packages
 - Equipment Packages
 - Architecture Flows
- **Standards**
 - Communications
 - Data
 - Format
 - Supporting Information

Terms & Definitions

- **User Services:** what ITS "should do" from the users perspective
 - Travel and Traffic Management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, and Information Management
- **User Service Requirements:** a specific functional statement of what must be done to support the "User Service"
 - "Thurston Regional ITS shall include an Incident Management function. Incident Management will identify incidents, formulate response actions, and support initiation and ongoing coordination of these response actions."
 - "As these functions are provided shall be: (1) Scheduled/Planned Incidents, (2) Identify Incidents, (3) Formulate Response Actions, (4) Support Coordinated Implementation of Response Actions, (5) Support Initiation of Response to Actions, and (6) Predict Hazardous Conditions."

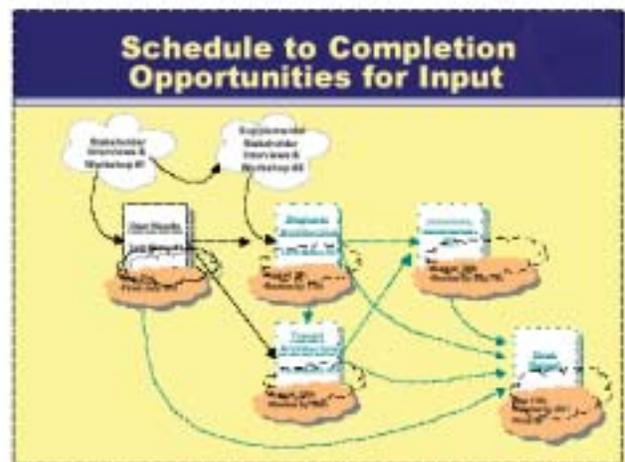
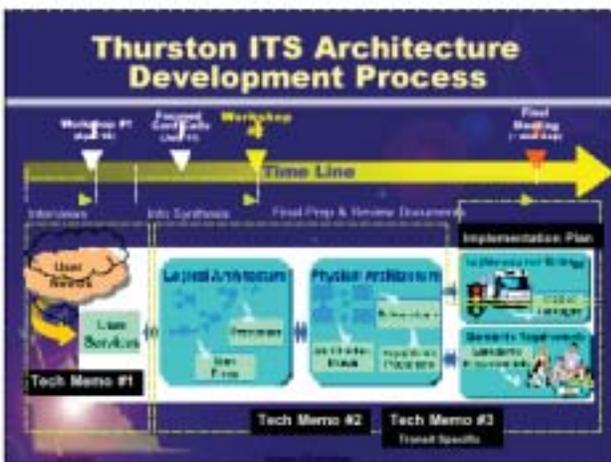
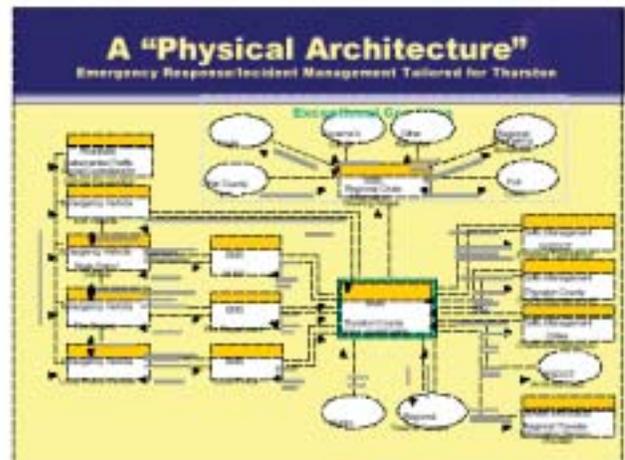
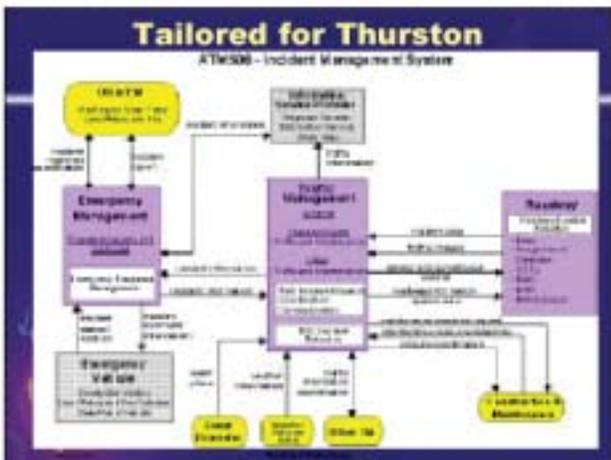
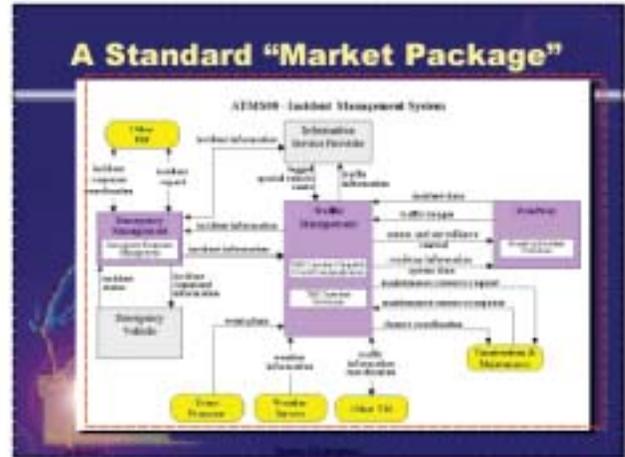
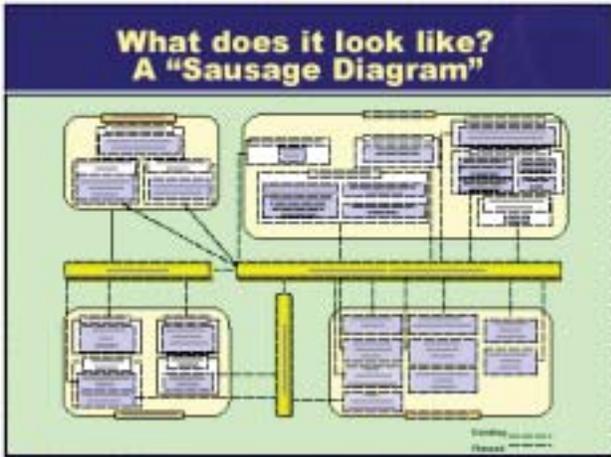
(More) Terms & Definitions

- **Equipment Package:** a "building block" of the architecture
 - Groups like processes together into an implementable package
 - Examples: Roadway Incident Detection, TMC Incident Detection
- **Architecture flow:** an "information exchange" interface between architectural components
 - One or more "data flows" between equipment packages
 - Examples: Incident data, traffic images, maintenance resource request
 - Ties into ITS Standards
- **Market Package:** a tailored, deployment-oriented perspective that identifies the "pieces" required to implement a particular transportation service
 - Examples: Incident Management System (ATMS06), Emergency Response (ICM)

So, what is the point?

- Move from "fuzzy" RFP, proposal and SOW language to a stable defined language
- Map a regional baseline, legacy, concurrent and planned projects to National ITS Architecture
- Yield a common regional understanding through:
 - common language, vocabulary
 - common style, and
 - consistent process
- **Accrued benefits:**
 - Improved system-level understanding
 - Regional baseline documented
 - Facilitates generation of planning & project documents
 - Reduced programmatic & technical risk for projects
 - Indication of product & subsystem portability, interoperability
 - Solid marketing basis (public & private sector)
 - Competitiveness for federal grant \$ and

... it's a requirement!



Next Opportunities for Feedback

- This workshop
 - Breakout sessions this afternoon
 - Inventory forms (please return)
- Document reviews
 - Regional Architecture [TM #2] (8/6-8/17)
 - Transit Architecture [TM #3] (8/18-8/24)
 - Implementation Plan (8/24-9/7)
 - Final Report (9/17-9/21)

Questions?

Thurston Regional ITS Architecture Development

Workshop No. 2 Architecture Review

Traffic Management &
Traveler Information

Thurston Regional Planning Council



July 25, 2001

Overview

- What's Included in Regional Traffic Management and Traveler Information
- Review Traffic Management and Traveler Information Needs
- Possible Technology Solutions
- Applicable ITS User Services
- Traffic Management & Traveler Information High-Level Architecture

What's Included in "Traffic and Traveler Information"?

- Freeway Management
 - WSDOT
- Local/Arterial Traffic Management
 - Cities
 - Thurston County (including Rural Roads)
- Traveler Information Service Providers
 - WSDOT
 - Independent Service Providers
- Information Recipients
 - Other Agencies
 - General Public
 - Freight Operators
 - Media

Review Traffic Management and Traveler Information Needs

Traffic Management Needs

- Manage Freeway
 - Efficiency at interchange (off-ramp)
 - Traffic surveillance (Camera, Detector)
 - Traffic advisory to motorists (CMS, HAR)
 - Coordination with local cities for diversion
- Manage Arterial/Local Streets
 - Efficiency on arterial streets
 - Flood/ice detection and warning
 - Traffic monitoring at construction site
 - Freight mobility /safety
 - Safety at railroad grade crossing

Traffic Management Needs

- Operational Efficiency
 - Resource management
 - Resource sharing within region (e.g., portable CMS)
 - Common computer base-map (planning, vehicle dispatch, 911, transit, etc.)
 - Wireless communication coverage in rural areas
 - Weather information at spot location

Traveler Information Needs

- Traveler information on I-5 and US101
- Traffic information for freight operator
 - Congestion
 - Alternative route
- Regional trip planning capability with Puget Sound
- Accurate near-term weather conditions and forecast
- Tailored traveler and system status information for school districts
- Traveler information for general public, media, other agencies

Possible Technology Solutions

Possible Traffic Management Solutions

- Expand freeway management in Thurston region (surveillance, control, en-route information)
- Adaptive off-ramp traffic signal with coordination on arterial street
- Corridor-based signal coordination
- Information sharing between WSDOT, County and Cities.

Possible Traffic Management Solutions

(Continued)

- Weather and environment sensors
- Highway-rail crossing warning system
- Resource sharing (e.g., portable CMS)
- Regional resource management system
- AVL for maintenance and public vehicles

Possible Traveler Information Solutions

- Traveler information data collection
 - Collect regional roadway system status, weather data
 - Collect multimodal transportation data (e.g., transit, ferry, etc.)
- Information fusing
 - Traveler information computer data server
 - Human-assisted data fusing process
 - Integration with Puget Sound region
 - Possible partnership with private Information Service Providers (ISP)

Possible Traveler Information Solutions

(Continued)

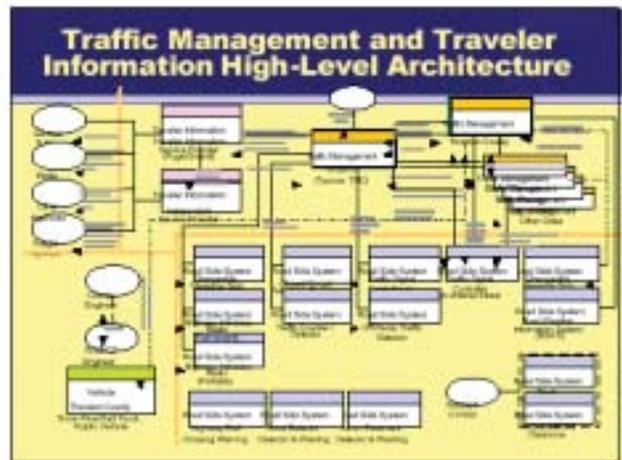
- Traveler information dissemination
 - Dissemination options
 - Internet
 - Interactive telephone
 - Kiosk
 - Public display device
 - TV
 - Radio
 - Pager
 - Fax
 - Users
 - Freight operator
 - School district
 - General public
 - Media

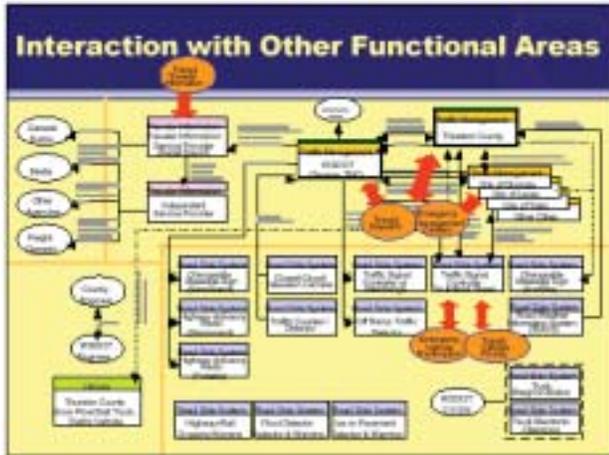
Applicable ITS User Services

Applicable ITS User Services

- Travel and Traffic Management
 - Pre-trip travel information
 - En-route driver information
 - Traffic control
 - Incident management
 - Highway-rail intersection
- Commercial Vehicle Operations
 - Commercial vehicle electronic clearance
- Information Management
 - Archived data functions

Traffic Management and Traveler Information High-Level Architecture





Thurston Regional ITS Architecture Development

Workshop No. 2

Architecture Review

Advanced Public Transportation

Thurston Regional Planning Council

July 25, 2001

ITS THURSTON ITS

Overview

- What's included in "public transportation"?
- Review public transportation needs
- Possible Technology Solutions
- Applicable ITS User Services
- Public Transportation High-Level Architecture

What's Included in "Public Transportation"?

- Intercity Transit
 - Fixed-Route
 - Demand-Responsive
- Special Needs Transportation Providers
 - Seniors
 - Disabled
 - Other "social service agency"
- School Bus
- Rideshare/vanpool

Review of Public Transportation Needs in Thurston Region

Intercity Transit Needs

- Fare payment (flexibility, convenience, data, handling costs)
- Schedule and route information
- Paratransit efficiency (coordination, billing, same-day flexibility)
- Transfers
- Schedule adherence/on-time
- Security/medical incidents
- Impacts of traffic/road conditions

Intercity Transit Needs

- Efficient service to low density areas
- Planning effectiveness (data & analysis, outreach, reporting)
- Preventative maintenance capabilities (& fleet management)

Special Needs Transportation Needs

- Improve billing processes
- Improve coordination (reduce redundancies, maximize resources across agencies, establish connections)

School Bus Needs

- Improve resource sharing (efficiency) with other providers
 - after school student or special need student transport by others
 - general public transport during school bus “off hours”
- Impact of traffic/road conditions

Rideshare/Vanpool Needs

- Improve billing efficiency
- Maximize convenience/flexibility/attractiveness

Possible Technology Solutions

Intercity Transit Solutions

- Electronic payment system, linked with other agencies
- Automated traveler information/trip planning system, linked with other agencies
- Automated passenger counters
- Automated annunciators
- Vehicle tracking and data communications system (w/mobile data terminals)
- Enhanced transfer coordination

Intercity Transit Solutions

- Traffic signal priority
- Enhanced communication/data exchange with traffic/emergency agencies
- Security monitoring
- Flex-route service
- Enhanced vehicle monitoring
- Driver monitoring

Special Needs Transportation Solutions

- Integrated smart card system
- Coordination and resource sharing (reservation, dispatch, vehicles) strategies using:
 - scheduling and dispatch software
 - voice and data communications
 - vehicle tracking

School Bus Solutions

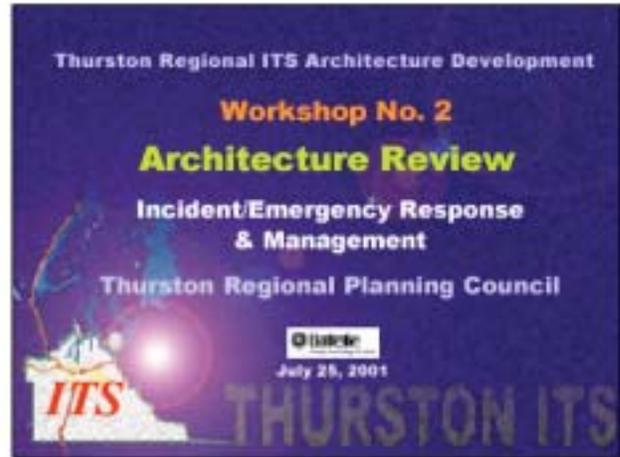
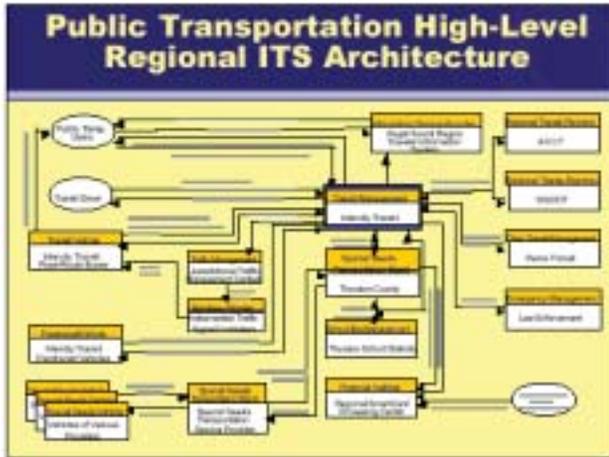
- Agreements for resource sharing, supported as necessary by:
 - communications technologies
 - scheduling/dispatch systems
- Inclusion in regional communications and information systems

Applicable ITS User Services

Applicable ITS User Services

- Public transportation management
 - Public transportation management
 - En-route transit information
 - Personalized public transit
 - Public travel security
- Electronic payment services
- Travel and traffic management
 - Ride matching and reservation
 - Traffic control (traffic signal priority)
- Emergency management
 - Emergency notification and personal security
- Information management
 - Archived data function

Public Transportation High Level Architecture



- ### Overview
- What's Included in Regional Incident Response/Emergency Management
 - Review Incident Response/Emergency Management Needs
 - Possible Technology Solutions
 - Applicable ITS User Services
 - Incident Response/Emergency Management High-Level Architecture

- ### What's Included in "Incident Response & Emergency Management"?
- Thurston County 911 (CAPCOM)
 - Freeway and Local/Arterial Streets
 - Emergency Call Taking
 - Emergency Dispatch/Response
 - Incident Dispatch Coordination/Communication
 - WSDOT
 - Freeway Incident Management
 - WSP
 - Freeway Incident Response
 - Local Police and Fire Departments
 - Incident Response

Review of Incident Response/Emergency Management Needs

- ### Review of Incident/Emergency Response & Management User Needs (1 of 3)
- Emergency Management
 - Incident response system.
 - Better Tracking of EMS Vehicles (AVL)
 - Improve real-time access to situation data for fire and EMS response (e.g., mobile data terminals?).
 - Surveillance/Detection
 - Need on-scene and en-route video data link from vehicles to 911 center, also internet access from vehicles.
 - Fixed and mobile CCTV surveillance and digital camera for emergency response and incident management (e.g., on-scene status reports with pictures or video)

Review of Incident/Emergency Response & Management User Needs (2 of 3)

- **Traveler Information**
 - Shortrange FM broadcast for localized traveler information, traffic control and incident management.
 - Traveler information signs at I-9101 interchange.
 - A supply of portable message signs available for city and county uses in exceptional conditions.
 - Need traffic and road weather conditions affecting major regional employers (e.g., capital, Ft. Lewis).
 - KQY (regional emergency radio broadcast) and TCTV (regional TV alert) actively involved.
- **Archiving**
 - "Formalize" the collection and dissemination of regional data and derived information for normal and exceptional operations.

Review of Incident/Emergency Response & Management User Needs (3 of 3)

- **Coordination and/or Communication**
 - Inter-agency communications and cooperation (e.g., WSP, state, county, city, 911, etc.).
 - Need to cooperate with higher regional agencies (e.g., state, Camp Murray) in the sharing of local operational, incident and emergency response status data and information.
- **Exceptional Conditions**
 - Need to improve centralized situation data collection and information dissemination during a crisis or unusual circumstances (e.g., earthquake, flood, I-5 closure, etc.).
 - Need to know the real-time status of regional trauma centers: St. Peters and then Madigan
 - Dissemination of "situation" information (Broadcast system and Portable Signs)

Possible Technology Solutions

Possible Technology Solutions

- **Center-to-Center**
 - Coordinated incident response and management procedures
 - Electronic data exchange between agencies (WSP, State, County, City, 911, etc.)
 - Computer-aided incident response management system
 - Communication patches between agencies
 - Data access to the status of regional trauma centers
 - Access to CCTV for emergency response information clearing house for exceptional condition
 - Improved coordination with regional emergency broadcast system for exceptional condition

Possible Technology Solutions

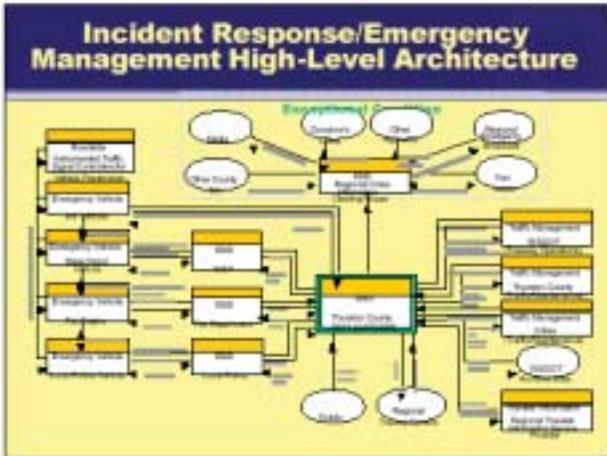
- **Roadway Implementation**
 - Portable message signs
 - Permanent changeable message signs
 - Portable HAR (short-range FM broadcast)
- **Vehicle Implementation**
 - AVL for all emergency response vehicles
 - Mobile Data Messaging system (e.g., MDT) for fire and EMS
 - Digital image or video from emergency response vehicle

Applicable ITS User Services

Applicable ITS User Services

- Emergency Management
 - Emergency Notification and Personal Security
 - Emergency Vehicle Management
- Travel and Traffic Management
 - Traffic Control
 - Incident Management
- Information Management
 - Archived Data Function

Incident Response/Emergency Management High-Level Architecture



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Appendix C

Interview & Workshop Extracts

User Comments & Interpretation Analysis Worksheets

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The following text and user comments were extracted from the interviews, and from comments added at Workshop #1. This was an initial step in the extraction of user needs that, in the consensus opinion of the consultant team, proved too detailed for presentation in this report. Thus, the results of this in-process analysis are presented for information only as background material.

User comments related to traffic systems operations and maintenance:

No.	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TF-1	Signal coordination is a primary ITS tool	The several cities in the Thurston region understand and appreciate the positive benefits of signal coordination within their jurisdictions and at their boundaries with each other and with the county and state roadway systems. I: (some) regional signal coordination is in place—cities, county, state?
TF-2	<i>Many informal communications structures in place; works fairly well</i>	There are many “informal” person-to-person communications channels in place, using telephone (wired & cell), fax and email, and these work well—except under unusual circumstances (e.g., such as an earthquake). A: there may be a need for (some) dedicated communications infrastructure (e.g., wired/fiber, leased) to ensure availability when we need it most. Routine day-to-day use would also be appropriate.
TF-3	(Need) Info and solutions for traffic diversions off I-5	There need to be a set of “reasonable” pre-planned diversion routes for incident scenarios on I-5 through the region. In the absence of these, or under more unusual circumstances, there needs to be a way for state and county to “get the word out” that a diversion is needed, and this is what it is (suggested). A: (see TF-8)
TF-4	(Need) Road closure information	We need to plan and disseminate road closure information within agencies affected and to the public—traveler, commuter, freight movement businesses. A: We need to make sure that road closure information (e.g., incidents, maintenance, construction, restrictions, etc.) is disseminated to widest possible audience in timely manner. This includes city, county, state and local agencies, school districts, travelers, truckers, etc.
TF-5	(Issue) Limited resources and use of technology	We have limited resources (e.g., \$, equipment and staff for O&M). We recognize there are “benefits” from use of ITS but we have to balance that with initial investment affordability and subsequent O&M support costs vs. the eventual “payoff”. A: To save investment \$, leverage “economy of scale” by buying regionally, same interoperable/interchangeable equipment. This benefits the “O&M” challenge too as staff won’t need training on multiple systems; become more “fungible” in the region.
TF-6	Limited area of surveillance and traffic detection	The state (WSDOT) currently has no surveillance of traffic on I-5 in the region—this is planned within the next 10 years. The county and cities could have it but cost and benefit don’t seem to be there. There are also privacy issues for county and city use of CCTV. A: WSDOT needs to extend the I-5, US 101 coverage into Thurston as planned; at key locations. A: Thurston county and cities should consider if there are any key “hot spots” where surveillance (e.g., loops, radar, CCTV) might make sense. I: WSDOT Olympic Region has surveillance on I-5 and SR 16 in Tacoma in Pierce County (to the north) but none in Thurston at this time.

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TF-7	Communications challenges	<p>While cellular and radio works well for normal regional O&M, there are dead spots in the region for both. Also, plain old telephone service (POTS) works well in most cases for voice, fax and data (modem)—except when there is a major incident (e.g., earthquake), then the POTS is clogged by everyone. We probably need some dedicated communications assets in certain circumstances.</p> <p>A: (see TF-2)</p>
TF-8	Have pre-planned diversion routes with Olympia and Lacey	<p>The state, Olympia and Lacey have agreed to pre-planned routes if I-5 closure happens.</p> <p>A: We should complete this Pre-incident diversion route planning effort for all cities on I-5, US 101 corridors – where it makes sense to do so.</p> <p>A: We should also have pre-planned traffic control measures coordinated with the state, county and cities (e.g., signals, signs, police, etc.).</p>
TF-9	Collocated with WSP and use their CAD for incidents	<p>WSDOT Olympic Region (which includes Thurston) is located in Tacoma, and collocated with WSP. They get very timely incident reports and disseminate that information via the WSDOT regional web site.</p> <p>I: The WSDOT Olympic Region and WSP are tightly coupled for incident and emergency response actions. This info (when appropriate to disseminate) is readily available on the WSDOT web site and would be for Thurston as well.</p>
TF-10	Send regional data to WSDOT “Flow Map” for traveler information	<p>All the data collected, and information reports (e.g., incidents, closures, maintenance, restrictions) are sent to the WSDOT web site. This site currently covers the Central Puget Sound region—will be extended to include Thurston when/if surveillance is extended down I-5 and on US 101.</p> <p>A: When there is data from Thurston, that data will produce information content also presented on the same WSDOT web site. The site will emerge as the “Puget Sound” traffic site, beyond its current “Central Puget Sound” coverage.</p>
TF-11	(Need) Added/extended traffic detection and surveillance on I-5 and 101 in Thurston	<p>WSDOT has plans to extend the surveillance coverage (e.g., traffic detection, CCTV) south on I-5 into Thurston; also to the west on US 101.</p> <p>A: (see TF-6)</p>
TF-12	(Issue) Have other problem spots—need surveillance	<p>There are several high traffic or incident prone locations that could benefit from spot surveillance (e.g., 101 at Black Lake, 101 at 8, etc.).</p> <p>A: We need to make sure that current and future identified “trouble spots” are included in the state’s plan for surveillance of state roadways.</p> <p>A: We’ll need to address the communications challenges posed by this surveillance need (see TF-2).</p>
TF-13	(Issue) Using microwave—not always best suited	<p>The WSDOT Olympic Region uses microwave to replace the wired (or fiber) infrastructure that isn’t currently available. This works in certain circumstances but isn’t (always) the best solution—we need wired/fiber infrastructure to best enable regional communications.</p> <p>A: Encourage action on the “Light Lanes” project to benefit Thurston region along the I-5 corridor (also see TF-2).</p> <p>I: WSDOT uses a combination of microwave communications and wired paths for CCTV on I-5 and SR 16 in Tacoma; nothing yet in Thurston.</p>
TF-14	<i>State of the art surveying and GIS divisions</i>	<p>(not ITS?) Our surveying and GIS divisions use state of the art digital mapping, GIS and GPS. This could be leveraged into very accurate inventory, detailed mapping of roadway systems for use in traffic management, incident response and data archiving.</p> <p>I: We have a “state of the art” basis for digital mapping useful in incident and emergency response and management (e.g., where accurate location is essential).</p>

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TF-15	Portable roadside equipment—no permanent installations	<p>We (Thurston County) have portable “ITS” equipment (e.g., traffic counters, message signs) , but no permanent installations—not sure we have any locations where we would actually need permanent message signs (for example).</p> <p>A: Consider where we (city, county) might deploy additional permanent roadside systems (e.g., message signs, highway advisory radio, lane controls, other controls or info devices) to best meet our needs for traffic info dissemination advisory and traveler en-route information.</p> <p>I: With the exception of signal systems, Thurston county has no permanent roadside ITS.</p>
TF-16	~6 signalized intersections—operation is contracted	<p>The county has ~6 signalized intersections—probably not a candidate for “ITS” unless they could be coordinated and shared control with adjacent city or state roadways.</p> <p>I: Thurston county has ~6 signalized intersections deployed for “surface street control”.</p> <p>A: If we had regional traffic signal coordination, should the county signals be extended, and/or integrated in some different way with those of the cities and state?</p>
TF-17	Flood sensors: 911 Call-Center, and EOC	<p>We have flood sensors (incident detection) located in the Nisqually Valley and other locations. We have a 911 Call-Center that works quite well and an adjacent EOC. This is how we do emergency management.</p> <p>I: We have a special case “incident detection” system deployed and operational.</p>
TF-18	(Need) Vehicle on-board systems (GPS, “measure & quantity)	<p>We have an extensive fleet of county vehicles and could benefit greatly from having vehicle location capability. Also we’d benefit from having that on-board system help us with “measure & quantity” both in terms of work accomplished, and materials (e.g., consumables) dispensed for snow & ice control.</p> <p>A: We need vehicle on-board systems for location tracking and management, and for us to collect and manage “measure & quantity”.</p>
TF-19	(Need) Resources management system (e.g., vehicles, consumables)	<p>If we had vehicle location and tracking, then we could use that information to better manage our fleet. Some software capability would help us there.</p> <p>A: We need a central facility that helps us better manage and control our county fleet (e.g., software?).</p>
TF-20	School district receives faxes on road closure (hazmat) or road construction—(How do they then relay this info to parents?)	<p>Our school districts do a good job of getting information to the regional school information web site (e.g., ???) and the radio and TV media serving the region. Parents can also call the school.</p> <p>I: The school districts (Puget Sound, statewide?) have their own mechanism for information dissemination about unusual circumstances affecting the schools and transportation to/from.</p> <p>A: Should the school district’s information dissemination be integrated with other regional information—perhaps delivered to regional agencies (e.g., cities, county, state) and as a “hot button” on a web site?</p>
TF-21	(City of Olympia Signal Maintenance) Public misunderstanding of traffic signal operations	<p>It would help us if the public better understood that we do time the signals to deal with the time-of-day situations that are typical.</p> <p>A: We need a “public outreach” program to better inform the traveling public about signals, timing, actions we take to make their lives better.</p>
TF-22	Traffic Signal Controllers (Olympia & Lacey) have different types? (NEMA, 170)	<p>We understand the benefits of regional and corridor signal timing. We face a challenge in that adjacent jurisdictions may have dissimilar signal controllers.</p> <p>I: Olympia and Lacey have dissimilar traffic control devices (see TF-23)</p>

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TF-23	Olympia-Lacey do have some signal coordination across jurisdictions. Theoretically, the existing infrastructure should support time-based coordination. Currently, no pressing need, but coming. Balance (flow on) main street with side street delay.	<p>We've worked out some (not all) possible cross-jurisdictional signal timing issues. The existing systems "should" support time-based coordination ...? We could benefit from an adaptive way to balance the benefits of mainline signal timing without ignoring the side streets.</p> <p>I: Olympia and Lacey have some signal coordination along corridor(s) and at jurisdictional interfaces.</p> <p>A: We could probably benefit from an adaptive approach to mainline arterial corridor signal timing that doesn't negatively affect the cross-streets.</p>
TF-24	City of Olympia has 94 signals (majority in the region). All but 2 are interconnected. Run 4 time-of-day patterns. Don't have a lot of special events/conditions that would warrant very sophisticated approaches.	<p>We're happy with our current four TOD patterns. But, while we don't feel a need for "sophisticated" approaches, we do occasionally have unplanned incidents (e.g., demonstrations at the Capital) that perturb the system. We handle these with special traffic control measures (e.g., police, barricades, 4-way stop, etc.)</p> <p>I: Olympia has surface street control with four TOD patterns deployed.</p> <p>A: How are the special traffic control measures implemented—at the box or from a central facility?</p>
TF-25	City of Olympia has partnered w/Intercity Transit on demo projects; they (City) have realized that widening is not an option for future plans.	<p>We have worked with IT on bus route-signal timing projects. We see that widening (e.g., for bus lanes, pull-outs, etc.) isn't an option. We could probably do more with signal priority but would like to deal with that in a smart way—giving buses priority only when behind schedule and with passenger loading that warrants the traffic priority benefits.</p> <p>I: Did any of these demo projects result in deployable ideas? What is the status of transit signal priority in the region? (see TR-x)</p>
TF-26	In regional transportation plan have "strategy areas" -- some will recognize and entail ITS	(non-ITS?)

User comments related to transit system operations and maintenance:

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TR-1	IT only public provider in Thurston County	I: IT operates the only fixed-route transit service in Thurston County. I: On-Demand or para-transit is provided by?
TR-2	Limited interaction with neighboring transit agencies—except Pierce Transit	The neighboring regions to the west, south and east are primarily rural; to the north is the Central Puget Sound urban region served by Pierce transit. I: There is some interaction between IT and Pierce Transit A: IT and Pierce would like to have more
TR-3	Pierce Transit is physical link between IT and Central Puget Sound	IT and Pierce Transit provide the link between the state capital and South Puget South urban areas in Thurston county -- to the Central and North Puget Sound Tacoma, Seattle urban areas. I: IT and Pierce are the transit operators for Thurston and Pierce counties.
TR-4	(Issue) Loss of transit funding (Motor Vehicle Excise Tax)	We face a significant funding challenge with the loss of MVET. We will need to leverage other funding opportunities and be very judicious in our expenditure of limited capital investment funds. We should always seek opportunities to leverage our projects with other regional projects to achieve “economies of scale” where possible.
TR-5	Limited technology in Thurston County and most neighbors; relatively advanced in Central Puget Sound region (including Pierce Transit)	We have limited technology deployed partly due to funding limitations and partly due to lack of clear demand. The Central and North Puget Sound has benefited greatly from Model Deployment and a history of successful ITS projects—we need to leverage that to our benefit and complete the transit landscape for the entire Puget Sound region—North to South. I: Transit ITS technology is limited—primarily rural fringes of Puget Sound urban region.
TR-6	(Need) Management tools (software, vehicle tracking)	IT would like to have the transit management tools to enhance their scheduling and operations. This might include: scheduling and runcutting, trip planning, two-way vehicle-to-central communications, vehicle tracking, schedule performance management, signal priority agreements, real-time transit traveler information, etc. A: IT needs complete suite of transit management capability from scheduling and runcutting, trip planning, vehicle tracking, two-way communications, schedule performance, signal priority, rider information, etc.
TR-7	(Need) Communications infrastructure	One of the challenges we face is a lack of communications infrastructure and known dead spots in our area of operations. We (IT) are not able to afford that infrastructure on our own—but, in cooperation with others, it may be achievable. A: IT needs communications infrastructure (e.g., wired/cabled/fiber, radio and radio relay, voice and data) for transit operations—vehicle-to-central, vehicle tracking, etc.
TR-8	(Need) Construction information	We need to know the roadway situation in our operating area—what routes and alternates are affected by construction, closures, restrictions, planned incidents, etc. A: We need a more direct access to city, county and state information and notification of construction, closures, restrictions, incidents, etc. for consideration in our fixed-route operations.
TR-9	(Issue) Loss of MVET funding; initial backbone investments are invisible; staff resources	

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TR-10	WSDOT – signal controllers can accommodate transit priority, is IT interested? City of Olympia and Lacey use different technologies. No agreement on need and degree of priority (No policy context yet.)	<p>As mentioned in TF-25, we’ve partnered with Olympia in traffic-transit demo projects. Regional traffic managers share the same concern with those throughout the region—what affect might transit signal priority have on signal timing for “normal flows”? We collectively are concerned and considering how we might approach signal priority with consideration of degree of priority for a bus, passenger loading, schedule adherence, etc. We also face the challenges of having different signal controller technologies in the cities we serve.</p> <p>A: We want signal priority but only if it can be achieved without sacrificing the well-designed “normal flows” during AM and PM peaks. We also want the technology that would enable us (our fleet) to make signal priority decisions on-board (e.g., I’m late, need priority; I’m on time or empty, don’t need priority).</p>
TR-11	Over the years IT and City of Olympia have unsuccessfully tried to fund a demo of transit signal priority.	We need to try again—let’s define a corridor that clearly would benefit from signal priority and request a demo project there.
TR-12	ACCT/WSDOT – problems w/sharing proprietary data as part of the trip-planning project—statewide. Trying to figure out how it will relate to regional efforts (e.g., RATP in Sound Area).	<p>RAPT (Regional A___ Trip Planning?) We are challenged by trying to share proprietary schedule and routing data (e.g., not in a common format, or not available outside the vendor’s system) between other ITS that could use it to do Thurston and regional (Puget Sound) trip planning.</p> <p>A: We need to convert our legacy systems data to a reasonable common format for use in regional trip planning. Do this as systems are upgraded/enhanced, or as a “project” in and of itself?</p>

User comments related to freight mobility:

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
FM-1	Minimal use of ITS technologies now; cell phones are primary	We use some ITS technology, but cell phones are the primary communications tool for trucking industry.
FM-2	(Need) Signal priority	We would like signal priority, especially on heavily traveled freight access routes in/out of ports and other transshipment facilities. A: Enable signal priority on freight routes in/out of port and access to other transshipment facilities.
FM-3	(Need) Accessible internet-based information	We really do need access to information of interest to truckers and freight mobility operations. This information would be similar but not identical to that provided to the general traveling public. It would include the freight routes (e.g., I-5, state routes) and information about conditions on access roadways to/from ports and transshipment facilities. A: We should develop a tailored, trucker (freight mobility)-specific web site or dial-up access system. This system would provide information on conditions specific to the freight industry. This site should report current and forecasted conditions for traffic congestion, construction, closures and restrictions.
FM-4	(Need) Real-time roadway and weather information	It is essential to the safety and efficiency of our operations that we have information about the roads and weather where we intend to travel. As mentioned in FM-3, if we could develop a “one-stop-web-site” for truckers--that would meet this need. A: (see FM-3) add weather conditions to traffic, roadway conditions.
FM-5	(Need) Rail improvements to increase (operating) speed	Our goal is to continue our program to increase the speed of the passenger rail operations in the I-5 corridor. We will not sacrifice safety in this effort. If rail bed has to be improved, we’ll do that; if crossings need to be improved with technology and safety equipment, we’ll do that too. This issue with high-speed trains is crossing safety—we are committed to improve safety as we increase speeds. I: WSDOT owns rolling stock (and operates?) high-speed passenger service to Eugene. I: There are several high-speed at grade crossing where safety might be an issue.
FM-6	(Need) Weigh station bypass technologies	The idea of technology to enable truckers to bypass weigh stations is catching on. There are a few incompatibilities but in general, things are working well where it (e.g., WIM) is implemented. The cost of the on-board system is/will decline and more trucks will be equipped. I: WIM is deployed in Washington, not yet in Thurston region (is it needed?). A: We should have every weigh station equipped with WIM so registered, safe truckers can be allowed to bypass.
FM-7	(Need) Web-based permitting	We need web-based permitting to speed up the process and minimize freight mobility downtime. This capability should produce more accurate commercial freight operations data and information, and also reduce the staffing cost for public agencies as well. A: We should deploy a web-based permitting system for commercial freight operators.

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
FM-8	(Need) Computers in trucks; text messaging	<p>As mentioned in FM-1, we use some technology in the vehicle. One device that is used in an on-board computer. As these proliferate, it would be critical to our operations to be able to acquire information en-route. This could be accomplished by email or by data transfer from the roadside (e.g., similar to HAR but with regional data to truckers or others able to receive).</p> <p>A: Consider a demo project to test the feasibility of highway advisory data streams to on-board computer systems.</p>
FM-9	(Issue) Proprietary information and costs to implement ITS solutions	<p>The fleet operators try very hard to claim market share, to operate safely and efficiently to reduce costs. In some cases this requires the disclosure of “proprietary” or “business sensitive” information to a public agency. It would be wrong for this information to be available to competing fleet operators; but, it is useful information and a “productivity and efficiency enhancement” for the fleet operator and the public agency when it comes to federal accounting, reporting and safety inspections.</p> <p>Most fleet operators are interested in on-board technology to make their operations safer and more efficient—but costs remain too high for many to “buy in”. This should change as the technology matures, and the public agencies deploy useful roadside systems that aid the industry.</p> <p>A: Public agencies must ensure that real-time and archived data from the trucking industry is adequately protected to avoid unauthorized disclosure.</p>
FM-10	Observe the “10-minute” rule for crossings	<p>We at the RR observe the “10-minute” rule in that we plan not to block a crossing for any longer than 10 minutes. This reduces the likelihood of isolating a community from emergency services of any kind. So, for our operation at least, it isn’t worthwhile to consider “at grade” crossing revisions to over/under pass—it just isn’t cost effective given the minimal risk. We do have actuated signal crossings at those locations where they are required for highway-rail intersection safety reasons.</p>
FM-11	Class 1 RR serve the Port of Olympia	<p>We don’t serve the Port of Olympia directly—our Class I RR partners do. Then we “meet” for transshipment or train reconstitution in a less congested part of the region.</p>
FM-12	(Need) More efficient switching for access to the Port of Olympia	<p>The access to the Port of Olympia could be improved to provide more efficient switching of the Class 1 operators going in/out. This would benefit all concerned.</p> <p>A: More efficient switching of trains in/out of Port of Olympia.</p>
FM-13	(Need) Integrated regional weather (rWeather?)	<p>The regional weather affects our operations as well as that of the transshipment facilities we use and out freight mobility partners (e.g., other rail, trucking, water). We need to stay abreast of the weather situation to plan our operations and response to conditions.</p> <p>A: (see FM-4) include consideration of railroad right-of-ways.</p>
FM-14	(Need) More up-front involvement in regional policies affecting freight mobility	(not ITS?)
FM-15	(Issue) Future of the Port of Olympia – Growth?	(not ITS?)
FM-16	(Issue) Policies that best serve the community in concert with freight mobility and rail access	(not ITS?)
FM-17	Need to coordinate truck routes across jurisdictions	<p>This could mean that whatever routing and technology enhancements apply in one jurisdiction should also apply in the adjoining jurisdiction. This applies most to technologies (e.g., WIM -- transponder technologies) but also to the quality and class of roadways designated for use as truck routes.</p> <p>A: We should ensure that all regional, jurisdiction systems deployed along truck routes are compatible.</p> <p>Issue of roads themselves is not ITS?</p>

User comments related to incident or emergency response and management:

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
IM-1	WSP is “On-Scene Command” by law; has CAD system used by others	<p>On state roadways, the WSP is always on-scene at an incident. They are in charge of incident management processes, status reporting, and requesting of emergency response from other agencies.</p> <p>I: the WSP is the incident management and emergency response coordinator for state roadways.</p>
IM-2	WSDOT uses WSP CAD and has IRT vehicles that can respond	<p>The WSDOT Olympic Region is collocated with the WSP (same building) and has direct access to the WSP CAD system for incident extraction. The WSDOT has Incident Response Team (IRT) vehicles that can respond to a scene at the request of WSP.</p> <p>I: WSDOT IRT has emergency response vehicles.</p>
IM-3	County has 911 Call-Center, EOC, flood sensors and incident response expert	<p>Thurston county has a 911 Call-Center and Emergency Operations Center (EOC). Calls for incidents/emergencies on state roadways are referred to WSP, others to appropriate agency (e.g., county, city). In more serious incident/emergency management situations, the EOC will activate and assume the role of regional emergency management center. The county has an “incident response expert” and has flood sensors positions at key trouble spots.</p> <p>I: the county has a 911 Call Center and an emergency management system.</p> <p>I: the county has deployed “roadside systems” (e.g., flood detectors) for incident detection.</p> <p>I: The county has an initial incident/emergency response capability.</p>
IM-4	Ft. Lewis provides MSCA and “good neighbor” policy	<p>Under certain circumstances (e.g., flood, forest fire, etc.), Ft. Lewis will provide assistance to local civil agencies.</p> <p>I: Ft. Lewis has an incident/emergency response capability that can be invoked in certain circumstances.</p>
IM-5	(Need) Integrated regional weather?	<p>(Ft. Lewis) expressed a need for integrated regional weather situation.</p> <p>A: the WSDOT “rWeather” system should include the capability to determine regional weather conditions and forecast in specific locations.</p>
IM-6	(Need) Emergency vehicle signal preemption?	<p>Emergency vehicles must have signal preemption capability in the region.</p> <p>I: Some, not all, of the regional signal systems have signal preemption capability. The regional standard is Opticom™.</p> <p>A: All regional signal systems, regardless of ownership and operating responsibility, must have compatible signal preemption capability.</p>
IM-7	(Issue) Communications (cell, radio) dead spots	<p>While radios and cell phones work well under normal day-to-day conditions, there are dead spots for both in the region and phone service becomes clogged in unusual circumstances (e.g., earthquake).</p> <p>I: cell phones and radio provide connectivity for most of the exiting communications links used in incident/emergency response.</p> <p>A: There may be a need for dedicated communications service to cover dead spots and avoid telephone system outages or non-availability (e.g., different radios, CDPD, dedicated wired infrastructure, etc.).</p>
IM-8	(Issue) Ft. Lewis as major employer, landowner and municipality of 50K	(non-ITS?)
IM-9	Police department – don’t have enough staff to provide neighborhood enforcement. Problem w/rural-intercity travelers coming into urbanized areas. Have 30 key “unmarked roads – un-signalized roads.	<p>There aren’t sufficient police officers to provide for traffic enforcement in neighborhoods and at all locations deemed necessary during incident or emergency response scenarios. Additionally, the higher-speed rural roadways (~30) that enter urbanized areas are often un-signalized – this is a safety concern.</p> <p>A: There are (at least) 30 rural-urban area roadway interfaces that could use signals or some sort of “slow down” warning devices (signage?, active devices “Your Speed Is ...”?, etc.).</p>

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
IM-10	As a capital city, have a lot of demonstrations, celebrations, protests, etc. Don't get advance info (naturally). Could have better communications among agencies, e.g., with IT. Currently coordinate with law enforcement, public works and provide info to media.	<p>We'd like to know sooner when an impromptu demonstration begins and where it is. Whoever "detects" it should call it in by whatever means is available (e.g., public works, transit, taxi, police, citizens, roadway surveillance, etc.). We then coordinate our response with appropriate agencies to perform crowd and traffic control, and law enforcement as needed. We provide status information (incident reports and status) to the media for public information (see TI-x).</p> <p>I: As a capital city, Olympia has higher occurrence of demonstrations—unplanned incidents involving crowd and traffic control.</p> <p>I: Coordination among law enforcement, public works and media is good.</p> <p>A: But, communications and information sharing between all agencies could be better.</p>
IM-11	Police control signals manually during special events and emergencies. Have Opticom™ for emergency vehicle preemption	<p>The signals can and are controlled by police manually during special planned or unplanned incidents. Emergency vehicles use Opticom™ signal preemption systems.</p> <p>I: Signal preemption is used.</p> <p>I: police can/do control signals manually during incident management.</p>
IM-12	Emergency Management – need improved real-time information for improved dispatching/response. Need better real-time info from hospitals and integrated into response strategy. Currently just use phones. St. Peters is primary hospital. Dispatchers call hospital and relay to drivers (info about availability at that hospital).	<p>We need better real-time information during the entire emergency response (medical) scenario. We need to know more accurately where the "incident" is located, better real-time status of the traffic and roadway situation during initial dispatch and route planning. Once we have the injury on board, we need to know hospital availability commensurate with the injuries and workload of the ER. We currently use telephone to call the hospital en-route.</p> <p>I: Primary trauma center is St. Peters; secondary is Madigan (Army).</p> <p>I: EMS uses cellular phones and radio to coordinate dispatch, routing and hospital availability.</p> <p>A: There is a need for better real-time IM/EM situation awareness: location of incident, traffic en-route, alternate routing, and hospital availability.</p> <p>(see IM-12)</p>
IM-13	Trauma Centers -- St. Peters is primary, Madigan is secondary	(see IM-12)
IM-14	Law enforcement (Olympia) has MDT's (mobile data terminals), but EMS and fire does not.	<p>The police (Olympia) have mobile data terminals but the fire department and emergency medical response teams do not.</p> <p>A: We should equip some/most/all fire and EMS vehicles with on-board systems such as MDT for use in dispatch, routing, hospital status, etc.</p>
IM-15	HAR a great tool that needs to be expanded.	<p>The highway advisory radio (HAR) system provides an excellent means to disseminate regional status information to the broadest en-route traveler audience—it needs to be expanded in coverage.</p> <p>I: there is existing HAR in two locations; there is/are "dead spots" for exiting HAR.</p> <p>A: the regional coverage of HAR needs to be expanded.</p>
IM-16	Need to better communicate and coordinate among centers.	<p>We need to better communicate and coordinate between "centers" of activity by: exchanging more data/information, more frequently, and/or using communications media with higher availability and higher speed.</p> <p>A: We need improved communications links. Expanded scope and range of data/information exchange between functional centers (see TF-2).</p>
IM-17	Dispatch: traffic situation & initial dispatch and en-route?	<p>We'd like to know what the traffic situation is en-route to an incident scene when we dispatch and how it changes while en-route. We would use this information to select an alternative route if necessary.</p> <p>A: We need better and more complete traffic situation information (e.g., state, county roads and city streets) for consideration in incident/emergency response dispatch, routing and while en-route – adaptive routing?</p>

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
IM-18	Need to improve en-route info (no in-vehicle web access).	<p>We presently have no means other than radio or cell phone for exchanging information while en-route to or from an incident scene.</p> <p>A: we need on-board systems to aid us while en-route doing incident/emergency response (see IM-14).</p>
IM-19	CDPD generally available. Local agencies will be on the same system, but not sure about connection to State Patrol.	<p>We used/will use cellular digital packet data (CDPD) systems successfully. They are generally more available when regular cellular or wired telephone isn't. We'd like more of our partner agencies to have the same capability for use in overload or unusual incident/emergency management situations. Not sure if WSP has the capability.</p> <p>I: CDPD is used on a limited but successful basis in the region (identify where).</p> <p>A: we need more CDPD devices and service for inter-agency coordination during incident/emergency management situations.</p>
IM-20	Feedback of situational info to EOC by various entities throughout community.	<p>We get some but not all the status feedback we need to be aware of the situation in the emergency operations center (EOC). Some of this "shortfall" is attributed to definition of inter-agency processes, some to lack of available and reliable communications media.</p> <p>I: When the EOC is in operation, the exchange of status information is ~OK, but not as good as it could be.</p> <p>A: We need a combination of enhanced/updated inter-agency roles and processes, and improved (e.g., available, reliable, sufficient bandwidth) communications (see TF-2).</p>

User comments related to traveler information:

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TI-1	Regional I-5, US and SR traffic data and images to WSDOT web site for traffic and incidents	<p>WSDOT Olympic and NW Regions contribute traffic data and roadway CCTV images to the (Central) Puget Sound “Flow Map” web site. This is very useful as a pre-trip planning tool for traffic situation awareness. The site includes a description of incidents that are affecting the traffic situation.</p> <p>I: WSDOT has implemented a pre-trip traveler information system. This information is available through a web site or as (raw) data from a WSDOT FTP site.</p> <p>A: The Thurston regional status information (e.g., state, county and city traffic and incidents, closures, construction, restrictions, etc.) should be included on this web site when this data/information becomes available from deployed or enhanced ITS.</p>
TI-2	Has 1-800 numbers for traffic and pass information; dedicated web site for pass conditions and roadway images	<p>WSDOT and other transportation agencies have 1-800 or local telephone access numbers, HAR broadcast and video images for information on the status of the transportation system. WSDOT info access includes the state and interstate systems, mountain passes, etc. – currently not including Thurston county. The county and cities each provide their own phone access to information; some have a web site.</p> <p>I: WSDOT has implemented an Olympic region traffic information dissemination capability but not including Thurston county—except when specifically reported.</p> <p>A: We need to integrate traffic, incident and roadway status data and information from the several cities, county and other sources for dissemination to the public (travelers) through a convenient means (e.g., broadcast media, WSDOT web site, local web site, single regional phone number, etc.).</p>
TI-3	(Need) data from I-5 corridor and other key locations through Thurston	<p>WSDOT has an expressed need and plans to extend their surveillance coverage south on I-5 into Thurston. This includes key locations on US 101. This data and information (e.g., CCTV images?) will then be disseminated to the public through existing means (e.g., HAR, web site, FTP site, phone access, etc.). It will also be available to local agencies for their use and integration with the Thurston regional status data and information.</p> <p>A: We need to extend the surveillance coverage on I-5 and other key locations on state roads in Thurston (see TF-6), and integrate that information with other regional source information.</p>
TI-4	(Need) Integrated data/information for the region; sources at WSDOT, county, cities, ...	<p>Restated—we need integrated regional data and information (see TI-2 and 3).</p>
TI-5	(Need) rWeather?	<p>We need and would use the state/UW rWeather site. They should continue that effort to enhance the resolution, extend the coverage, and integrate the multi-source data and information into a regional picture and forecast we could use.</p> <p>I: the rWeather site exists and provides useful integrated weather situation (forecasts?).</p> <p>A: We need to ensure that the rWeather site is extended to include Thurston regional, and that it is enhanced in resolution and to provide forecast information.</p>
TI-6	Public Schools Emergency Access System (a web site)	<p>There is a (statewide, regional?) web site where schools can publish their information of interest to students and parents (e.g., open/closed, delayed, early release, etc.).</p>
TI-7	Construction/traffic info faxed to school districts.	<p>The cities, county (and state?) fax their construction information to the local school districts (each school?).</p> <p>I: There is a specific link between roadway construction & maintenance and the schools for the delivery of roadway status information.</p>

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
TI-8	School students all hit the road at same time – need traveler info?	<p>The school districts transportation systems hit the road at the same time – pre-trip traffic and roadway status information would be useful. They share the city/county roads in the ~same M-F morning travel peak period; less likely in the afternoon/evening peak period. This also applies to the students who drive themselves to/from school.</p> <p>A: We need pre-trip traveler advisory information tailored for the school districts and students on their specific routes traveled in the AM and PM school travel peaks.</p>
TI-9	KGY – is the regional emergency (exceptional conditions) broadcast radio station	<p>We all (e.g., City of Olympia, schools, etc.) use our local media (radio station KGY) to “get the word out” about unusual and emergency circumstances. This is well-known by all our residents and local commuters; not that well-known, and perhaps not that useful to through travelers and others unfamiliar with the region.</p> <p>I: There is a well-established means to disseminate exceptional transportation system status information through the media (KGY).</p>
TI-10	TCTV – text alerts	<p>We also use television (station TCTV [Thurston County TV?]) to broadcast “text alerts” to our residents (see TI-9).</p> <p>I: There is a well-established means to disseminate exceptional transportation system status information using local television (TCTV).</p>
TI-11	City of Olympia has telephone info line and a web site.	<p>The City of Olympia has its own web site and telephone information line.</p> <p>I: There is a city (Olympia) telephone traveler (and other) information access system. [Is this toll-free or local number? What is the scope of information available on that line? Is it a human-operator, recorded message or menu system?]</p>
TI-12	HAR – outstanding – should be expanded in coverage	(see IM-15)
TI-13	Communications centers (CAPCOM) – WSP on-scene (What is the “ground truth”?)	<p>We have some challenges with knowing the true situation real-time on-scene. This is due to a combination of not getting frequent enough reports (because the WSP on -scene is probably very busy), and limitations of the communications means used.</p> <p>I: There are “on-scene” reports but it is felt that these are too infrequent, and suspect in their real-time status accuracy.</p> <p>A: We need more frequent real-time status reports from an incident/emergency response scene. This can come from WSP (preferred) or other sources (specifically dedicated to on-scene reporting?). Might this include on-scene video or snap-shots sent via internet/FTP site as done/attempted in Seattle?</p>
TI-14	All – called Metro Traffic in Seattle to get info on other broadcast radio stations	<p>We do use the broader regional broadcast media to “get the word out”. We call Metro Traffic in Seattle to let them know our situation—they get in into their TV and radio reports.</p> <p>I: There is a well-established process and means to notify broader Puget Sound regional broadcast media about Thurston situational status of interest (e.g., to southbound travelers, commercial operators, etc.).</p>

User comments related to information capture and storage:

<u>No.</u>	<u>Stated User Need (or Capability)</u>	<u>Interpretation (What does this mean—what action is appropriate?)</u>
IS-1	Snow and ice control – time and place data	<p>We want to keep records (data) on the occurrences of snow and ice, time and location,</p> <p>A: We need data collection, GIS, vehicle location/GPS capability to accurately locate, collect data on snow and ice occurrences and control measures.</p> <p>A: We need a data archive to hold the repository of snow and ice data. [And certainly, other as yet undefined data.]</p>
IS-2	Data integration: across agency, vendor, ... systems	<p>We recognize that we have systems that can and do produce data—but these data are often incompatible across systems with identical functions, different vendors, etc. We want to be able to collect, use and archive this data for system control and management, and planning purposes.</p> <p>A: We need a way to integrate data from multiple vendors, in different formats, and across time and location specifications. That is, we need to require and use standards in our regional ITS.</p>

The following is the list of all identified inventory items:

<u>Source</u>	<u>Inventory Item/Comment</u>	<u>Maps to Existing User Service(s)</u>
TF-1	(some) regional signal coordination is in place—cities, county, state?	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TF-6	WSDOT Olympic Region has surveillance on I-5 and SR 16 in Tacoma in Pierce County (to the north) but none in Thurston at this time.	Travel and Traffic Management (1.0) -- Traffic Control (1.6), Traffic Surveillance (1.6.2)
TF-9	The WSDOT Olympic Region and WSP are tightly coupled for incident and emergency response actions. This info (when appropriate to disseminate) is readily available on the WSDOT web site and would be for Thurston as well.	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6) Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)
TF-13	WSDOT uses a combination of microwave communications and wired paths for CCTV on I-5 and SR 16 in Tacoma; nothing yet in Thurston.	[applicable to all user services – communications media]
TF-14	We have a “state of the art” basis for digital mapping useful in incident and emergency response and management (e.g., where accurate location is essential).	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6) Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)
TF-15	With the exception of signal systems, Thurston county has no permanent roadside ITS.	Information Management (7.0) – Archived Data Function (7.1) Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TF-16	Thurston county has ~6 signalized intersections deployed for “surface street control”.	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TF-17	We have a special case “incident detection” system deployed and operational.	Emergency Management (5.0) – Emergency Notification and Personal Security (5.1)
TF-20	The school districts (Puget Sound, statewide?) have their own mechanism for information dissemination about unusual circumstances affecting the schools and transportation to/from.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
TF-22	Olympia and Lacey have dissimilar traffic control devices (see TF-23)	(affects) Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TF-23	Olympia and Lacey have some signal coordination along corridor(s) and at jurisdictional interfaces.	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TF-24	Olympia has surface street control with four TOD patterns deployed.	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TF-25	Did any of these demo projects result in deployable ideas? What is the status of transit signal priority in the region? (see TR-x)	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
TR-1	IT operates the only fixed-route transit service in Thurston County.	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-1	I: On-Demand or para-transit is provided by?	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-2	There is some interaction between IT and Pierce Transit	Public Transportation Management (2.0) – Personalized Public Transit (2.3)
TR-3	IT and Pierce are the transit operators for Thurston and Pierce counties.	Public Transportation Management (2.0) – Public Transportation Management (2.1)
FM-5	WSDOT owns rolling stock (and operates?) high-speed passenger service to Eugene.	Public Transportation Management (2.0) – Public Transportation Management (2.1) Travel and Traffic Management (1.0) – Highway-Rail Intersection (1.10)

<u>Source</u>	<u>Inventory Item/Comment</u>	<u>Maps to Existing User Service(s)</u>
FM-5	There are several high-speed at grade crossing where safety might be an issue.	Travel and Traffic Management (1.0) – Highway-Rail Intersection (1.10)
FM-6	WIM is deployed in Washington, not yet in Thurston region (is it needed?).	Commercial Vehicle Operations (4.0) – Commercial Vehicle Electronic Clearance (4.1)
IM-1	the WSP is the incident management and emergency response coordinator for state roadways.	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6)
IM-2	WSDOT IRT has emergency response vehicles.	Emergency Management (5.0) – Emergency Vehicle Management (5.2) Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6)
IM-3	the county has a 911 Call Center and an emergency management system.	Emergency Management (5.0) – Emergency Vehicle Management (5.2)
IM-3	The county has an initial incident/emergency response capability.	Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)
IM-3	the county has deployed “roadside systems” (e.g., flood detectors) for incident detection.	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6)
IM-4	Ft. Lewis has an incident/emergency response capability that can be invoked in certain circumstances.	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6)
IM-6	Some, not all, of the regional signal systems have signal preemption capability. The regional standard is Opticom™.	Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)
IM-7	cell phones and radio provide connectivity for most of the exiting communications links used in incident/emergency response.	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
IM-7		[applicable to all user services – communications media]
IM-10	As a capital city, Olympia has higher occurrence of demonstrations—unplanned incidents involving crowd and traffic control.	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6)
IM-10	Coordination among law enforcement, public works and media is good.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Traffic Control (1.6), Incident Management (1.7)
IM-11	police can/do control signals manually during incident management.	Travel and Traffic Management (1.0) -- Incident Management (1.7), Traffic Control (1.6)
IM-11	Signal preemption is used.	Travel and Traffic Management (1.0) -- Traffic Control (1.6)
IM-12	EMS uses cellular phones and radio to coordinate dispatch, routing and hospital availability.	Emergency Management (5.0) – Emergency Vehicle Management (5.2)
IM-12	Primary trauma center is St. Peters; secondary is Madigan (Army).	Emergency Management (5.0) – Emergency Vehicle Management (5.2)
IM-15	there is existing HAR in two locations; there is/are “dead spots” for exiting HAR.	Travel and Traffic Management (1.0) –En-Route Driver Information (1.2)
IM-19	CDPD is used on a limited but successful basis in the region (identify where).	[applicable to all user services – communications media]
IM-20	When the EOC is in operation, the exchange of status information is ~OK, but not as good as it could be.	Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)

Source	Inventory Item/Comment	Maps to Existing User Service(s)
TI-1	WSDOT has implemented a pre-trip traveler information system. This information is available through a web site or as (raw) data from a WSDOT FTP site.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), Travel Demand Management (1.8)
TI-2	WSDOT has implemented an Olympic region traffic information dissemination capability but not including Thurston county—except when specifically reported.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
TI-5	the rWeather site exists and provides useful integrated weather situation (forecasts?).	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
TI-7	There is a specific link between roadway construction & maintenance and the schools for the delivery of roadway status information.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1)
TI-9	There is a well-established means to disseminate exceptional transportation system status information through the media (KGY).	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
TI-10	There is a well-established means to disseminate exceptional transportation system status information using local television (TCTV).	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
TI-11	There is a city (Olympia) telephone traveler (and other) information access system. [Is this toll-free or local number? What is the scope of information available on that line? Is it a human-operator, recorded message or menu system?]	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
TI-13	There are “on-scene” reports but it is felt that these are too infrequent, and suspect in their real-time status accuracy.	Travel and Traffic Management (1.0) -- Incident Management (1.7)
TI-14	There is a well-established process and means to notify broader Puget Sound regional broadcast media about Thurston situational status of interest (e.g., to southbound travelers, commercial operators, etc.).	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)

The following is the list of all identified user needs action items:

<u>Source</u>	<u>Action Item/Comment</u>	<u>Maps to Needed (Planned or Unplanned) User Service(s)</u>
TF-2	there may be a need for (some) dedicated communications infrastructure (e.g., wired/fiber, leased) to ensure availability when we need it most. Routine day-to-day use would also be appropriate.	Travel and Traffic Management (1.0) –Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Incident Management (1.7) Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2) [applicable to all user services – communications media]
TF-3	(see TF-8)	
TF-4	We need to make sure that road closure information (e.g., incidents, maintenance, construction, restrictions, etc.) is disseminated to widest possible audience in timely manner. This includes city, county, state and local agencies, school districts, travelers, truckers, etc.	Travel and Traffic Management (1.0) –Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Route Guidance (1.3), Travel Demand Management (1.8) Emergency Management (5.0) – Emergency Vehicle Management (5.2)
TF-5	To save investment \$, leverage “economy of scale” by buying regionally, same interoperable/interchangeable equipment. This benefits the “O&M” challenge too as staff won’t need training on multiple systems; become more “fungible” in the region.	[policy action?]
TF-6	Thurston county and cities should consider if there are any key “hot spots” where surveillance (e.g., loops, radar, CCTV) might make sense.	Travel and Traffic Management (1.0) – Traffic Control (1.6), Traffic Surveillance (1.6.2), Incident Management (1.7)
TF-6	WSDOT needs to extend the I-5, US 101 coverage into Thurston as planned; at key locations.	Travel and Traffic Management (1.0) – Traffic Control (1.6), Traffic Surveillance (1.6.2)
TF-7	(see TF-2)	
TF-8	We should complete this Pre-incident diversion route planning effort for all cities on I-5, US 101 corridors – where it makes sense to do so.	Travel and Traffic Management (1.0) –Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Route Guidance (1.3), Travel Demand Management (1.8) Emergency Management (5.0) – Emergency Vehicle Management (5.2)
TF-10	When there is data from Thurston, that data will produce information content also presented on the same WSDOT web site. The site will emerge as the “Puget Sound” traffic site, beyond its current “Central Puget Sound” coverage.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), Travel Demand Management (1.8)
TF-12	We need to make sure that current and future identified “trouble spots” are included in the state’s plan for surveillance of state roadways.	Travel and Traffic Management (1.0) – Traffic Control (1.6), Traffic Surveillance (1.6.2), Incident Management (1.7)
TF-12	We’ll need to address the communications challenges posed by this surveillance need (see TF-2).	Travel and Traffic Management (1.0) – Traffic Control (1.6), Traffic Surveillance (1.6.2), Incident Management (1.7) [applicable to all user services – communications media]
TF-13	Encourage action on the “Light Lanes” project to benefit Thurston region along the I-5 corridor (also see TF-2).	[applicable to all user services – communications media]
TF-15	Consider where we (city, county) might deploy additional permanent roadside systems (e.g., message signs, highway advisory radio, lane controls, other controls or info devices) to best meet our needs for traffic info dissemination advisory and traveler en-route information.	Travel and Traffic Management (1.0) – En-Route Driver Information (1.2), Traffic Control (1.6), Travel Demand Management (1.8)
TF-16	If we had regional traffic signal coordination, should the county signals be extended, and/or integrated in some different way with those of the cities and state?	Travel and Traffic Management (1.0) –Traffic Control (1.6)

<u>Source</u>	<u>Action Item/Comment</u>	<u>Maps to Needed (Planned or Unplanned) User Service(s)</u>
TF-18	We need vehicle on-board systems for location tracking and management, and for us to collect and manage “measure & quantity”.	Travel and Traffic Management (1.0) – Route Guidance (1.3), Route Guidance-Real-Time Mode (1.3.3) Archived Data Function (7.1)
TF-19	We need a central facility that helps us better manage and control our county fleet (e.g., software?).	Travel and Traffic Management (1.0) – Route Guidance (1.3), Route Guidance-Real-Time Mode (1.3.3) Archived Data Function (7.1)
TF-20	Should the school district’s information dissemination be integrated with other regional information—perhaps delivered to regional agencies (e.g., cities, county, state) and as a “hot button” on a web site?	Travel and Traffic Management (1.0) –Pre-Trip Traveler Information (1.1)
TF-21	We need a “public outreach” program to better inform the traveling public about signals, timing, actions we take to make their lives better.	[policy action?]
TF-23	We could probably benefit from an adaptive approach to mainline arterial corridor signal timing that doesn’t negatively affect the cross-streets.	Travel and Traffic Management (1.0) –Traffic Control (1.6)
TF-24	How are the special traffic control measures implemented—at the box or from a central facility?	Travel and Traffic Management (1.0) –Traffic Control (1.6)
TR-2	IT and Pierce would like to have more (interaction, integration)	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-6	IT needs complete suite of transit management capability from scheduling and runcutting, trip planning, vehicle tracking, two-way communications, schedule performance, signal priority, rider information, etc.	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-7	IT needs communications infrastructure (e.g., wired/cabled/fiber, radio and radio relay, voice and data) for transit operations—vehicle-to-central, vehicle tracking, etc.	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-8	We need a more direct access to city, county and state information and notification of construction, closures, restrictions, incidents, etc. for consideration in our fixed-route operations.	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-10	We want signal priority but only if it can be achieved without sacrificing the well-designed “normal flows” during AM and PM peaks. We also want the technology that would enable us (our fleet) to make signal priority decisions on-board (e.g., I’m late, need priority; I’m on time or empty, don’t need priority).	Public Transportation Management (2.0) – Public Transportation Management (2.1)
TR-12	We need to convert our legacy systems data to a reasonable common format for use in regional trip planning. Do this as systems are upgraded/enhanced, or as a “project” in and of itself?	Public Transportation Management (2.0) – Public Transportation Management (2.1)
FM-2	Enable signal priority on freight routes in/out of port and access to other transshipment facilities.	Travel and Traffic Management (1.0) –Traffic Control (1.6) Commercial Vehicle Operations (4.0) – Commercial Vehicle Electronic Clearance (4.1)
FM-3	We should develop a tailored, trucker (freight mobility)-specific web site or dial-up access system. This system would provide information on conditions specific to the freight industry. This site should report current and forecasted conditions for traffic congestion, construction, closures and restrictions.	Travel and Traffic Management (1.0) –Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Traveler Services Information (1.5)
FM-4	(see FM-3) add weather conditions to traffic, roadway conditions.	Travel and Traffic Management (1.0) – Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Traveler Services Information (1.5)
FM-5	Build or improve high-speed rail crossings to ensure safe and efficient operations.	Travel and Traffic Management (1.0) – Highway-Rail Intersection (1.10)

<u>Source</u>	<u>Action Item/Comment</u>	<u>Maps to Needed (Planned or Unplanned) User Service(s)</u>
FM-6	We should have every weigh station equipped with WIM so registered, safe truckers can be allowed to bypass.	Commercial Vehicle Operations (4.0) – Commercial Vehicle Electronic Clearance (4.1), Commercial Vehicle Administrative Processes (4.4)
FM-7	We should deploy a web-based permitting system for commercial freight operators.	Commercial Vehicle Operations (4.0) – Commercial Vehicle Administrative Processes (4.4)
FM-8	Consider a demo project to test the feasibility of highway advisory data streams to on-board computer systems.	Travel and Traffic Management (1.0) –En-Route Driver Information (1.2), In-Vehicle Signing (1.2.3)
FM-9	Public agencies must ensure that real-time and archived data from the trucking industry is adequately protected to avoid unauthorized disclosure.	Commercial Vehicle Operations (4.0) – Commercial Vehicle Electronic Clearance (4.1), Commercial Vehicle Administrative Processes (4.4)
FM-12	More efficient switching of trains in/out of Port of Olympia.	Travel and Traffic Management (1.0) – Highway-Rail Intersection (1.10)
FM-13	(see FM-4) include consideration of railroad right-of-ways.	Travel and Traffic Management (1.0) – Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Traveler Services Information (1.5)
FM-17	We should ensure that all regional, jurisdiction systems deployed along truck routes are compatible.	Commercial Vehicle Operations (4.0) – Commercial Vehicle Electronic Clearance (4.1), Commercial Vehicle Administrative Processes (4.4)
IM-5	the WSDOT “rWeather” system should include the capability to determine regional weather conditions and forecast in specific locations.	Travel and Traffic Management (1.0) – Pre-Trip Travel Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8)
IM-6	All regional signal systems, regardless of ownership and operating responsibility, must have compatible signal preemption capability.	Travel and Traffic Management (1.0) – Traffic Control (1.6)
IM-7	There may be a need for dedicated communications service to cover dead spots and avoid telephone system outages or non-availability (e.g., different radios, CDPD, dedicated wired infrastructure, etc.).	[applicable to all user services – communications media]
IM-9	There are (at least) 30 rural-urban area roadway interfaces that could use signals or some sort of “slow down” warning devices (signage?, active devices “Your Speed Is ...”?, etc.).	Travel and Traffic Management (1.0) – En-Route Driver Information (1.2), Traffic Control (1.6)
IM-10	But, communications and information sharing between all agencies could be better.	[applicable to all user services – communications media]
IM-12	There is a need for better real-time IM/EM situation awareness: location of incident, traffic en-route, alternate routing, and hospital availability.	[applicable to all user services – communications media]
IM-14	We should equip some/most/all fire and EMS vehicles with on-board systems such as MDT for use in dispatch, routing, hospital status, etc.	Travel and Traffic Management (1.0) – Route Guidance (1.3) Emergency Management (5.0) – Emergency Vehicle Management (5.2)
IM-15	the regional coverage of HAR needs to be expanded.	Travel and Traffic Management (1.0) – En-Route Driver Information (1.2)
IM-16	We need improved communications links. Expanded scope and range of data/information exchange between functional centers (see TF-2).	[applicable to all user services – communications media]
IM-17	We need better and more complete traffic situation information (e.g., state, county roads and city streets) for consideration in incident/emergency response dispatch, routing and while en-route – adaptive routing?	Travel and Traffic Management (1.0) – Route Guidance (1.3), Traffic Control (1.6), Traffic Surveillance (1.6.2), Incident Management (1.7) Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)
IM-18	we need on-board systems to aid us while en-route doing incident/emergency response (see IM-14).	Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2)
IM-19	we need more CDPD devices and service for inter-agency coordination during incident/emergency management situations.	Travel and Traffic Management (1.0) – Incident Management (1.7), Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2) [applicable to all user services – communications media]

<u>Source</u>	<u>Action Item/Comment</u>	<u>Maps to Needed (Planned or Unplanned) User Service(s)</u>
IM-20	We need a combination of enhanced/updated inter-agency roles and processes, and improved (e.g., available, reliable, sufficient bandwidth) communications (see TF-2).	Travel and Traffic Management (1.0) –Traffic Control (1.6), Incident Management (1.7) Emergency Management (5.0) – Emergency Notification and Personal Security (5.1), Emergency Vehicle Management (5.2) [applicable to all user services – communications media]
TI-1	The Thurston regional status information (e.g., state, county and city traffic and incidents, closures, construction, restrictions, etc.) should be included on this web site when this data/information becomes available from deployed or enhanced ITS.	Travel and Traffic Management (1.0) –Pre-Trip Traveler Information (1.1), Travel Demand Management (1.8)
TI-2	We need to integrate traffic, incident and roadway status data and information from the several cities, county and other sources for dissemination to the public (travelers) through a convenient means (e.g., broadcast media, WSDOT web site, local web site, single regional phone number, etc.).	Travel and Traffic Management (1.0) – Pre-Trip Traveler Information (1.1), En-Route Driver Information (1.2), Travel Demand Management (1.8) Emergency Management (5.0) – Emergency Vehicle Management (5.2)
TI-3	We need to extend the surveillance coverage on I-5 and other key locations on state roads in Thurston (see TF-6), and integrate that information with other regional source information.	Travel and Traffic Management (1.0) – Traffic Control (1.6), Traffic Surveillance (1.6.2)
TI-5	We need to ensure that the rWeather site is extended to include Thurston regional, and that it is enhanced in resolution and to provide forecast information.	Travel and Traffic Management (1.0) – Pre-Trip Traveler Information (1.1), Incident Management (1.7), Travel Demand Management (1.8) Emergency Management (5.0) – Emergency Vehicle Management (5.2)
TI-8	We need pre-trip traveler advisory information tailored for the school districts and students on their specific routes traveled in the AM and PM school travel peaks.	Travel and Traffic Management (1.0) – Pre-Trip Traveler Information (1.1), Travel Demand Management (1.8)
TI-13	We need more frequent real-time status reports from an incident/emergency response scene. This can come from WSP (preferred) or other sources (specifically dedicated to on-scene reporting?). Might this include on-scene video or snap-shots sent via internet/FTP site as done/attempted in Seattle?	Travel and Traffic Management (1.0) – Incident Management (1.7) Emergency Management (5.0) – Emergency Notification and Personal Security (5.1)
IS-1	We need a data archive to hold the repository of snow and ice data. [And certainly, other as yet undefined data.]	Archived Data Function (7.1)
IS-1	We need data collection, GIS, vehicle location/GPS capability to accurately locate, collect data on snow and ice occurrences and control measures.	Travel and Traffic Management (1.0) – Route Guidance (1.3), Route Guidance-Real-Time Mode (1.3.3) Archived Data Function (7.1)
IS-2	We need a way to integrate data from multiple vendors, in different formats, and across time and location specifications. That is, we need to require and use standards in our regional ITS.	Archived Data Function (7.1)

Worksheet – initial mapping of inventory and action items to user services:

User Service	No.	Traces to Inventory Item	Traces to Action Item
Travel and Traffic Management			
Pre-Trip Travel Information	1.1	TF-20, IM-10, TI-1, TI-2, TI-5, TI-7, TI-9, TI-10, TI-11, TI-14	TF-2, TF-4, TF-8, TF-10, TF-20, FM-3, FM-4, FM-13, IM-5, TI-1, TI-2, TI-5, TI-8
En-Route Driver Information	1.2	TF-20, IM-10, IM-15, TI-2, TI-5, TI-9, TI-10, TI-11, TI-15	TF-2, TF-4, TF-8, TF-15, FM-3, FM-4, FM-7, FM-13, IM-5, IM-9, IM-15, TI-2
Route Guidance	1.3	TF-20	TF-4, TF-8, TF-18, TF-19, IM-14, IM-17, IS-2
<i>Ride Matching and Reservation</i>	1.4	N/A	N/A
Traveler Services Information	1.5		FM-3, FM-4, FM-13
Traffic Control	1.6	TF-1, TF-6, TF-9, TF-14, TF-15, TF-16, TF-22, TF-23, TF-24, TF-25, IM-1, IM-2, IM-3, IM-4, IM-6, IM-10, IM-11	TF-6, TF-12, TF-15, TF-16, TF-23, TF-24, FM-2, IM-6, IM-9, IM-17, IM-20, TI-3
Incident Management	1.7	TF-9, TF-14, IM-1, IM-2, IM-3, IM-4, IM-10, IM-11, TI-13	TF-2, TF-12, IM-17, IM-19, IM-20, TI-5, TI-13
Travel Demand Management	1.8	TF-20, TI-1, TI-2, TI-5, TI-9, TI-10, TI-11, TI-15	TF-4, TF-8, TF-10, TF-15, IM-5, TI-1, TI-2, TI-5, TI-8
<i>Emissions Testing and Mitigation</i>	1.9	N/A	N/A
Highway-Rail Intersection	1.10	FM-5	FM-5, FM-12
Public Transportation Management			
Public Transportation Management	2.1	TF-25, TR-1, TR-2, TR-3	TR-2, TR-6, TR-7, TR-8, TR-10, TR-12
En-Route Transit Information	2.2		
Personalized Public Transit	2.3	TR-1	
Electronic Payment			
		N/A	N/A
Commercial Vehicle Operations			
Commercial Vehicle Electronic Clearance	4.1	FM-6	FM-2, FM-6, FM-9, FM-17
<i>Automated Roadside Safety Inspection</i>	4.2	N/A	N/A
<i>On-Board Safety Monitoring</i>	4.3	N/A	N/A
Commercial Vehicle Administrative Processes	4.4		FM-6, FM-7, FM-9, FM-17
<i>Hazardous Material Incident Response</i>	4.5	N/A	N/A
<i>Commercial Fleet Management</i>	4.6	N/A	N/A
Emergency Management			
Emergency Notification and Personal Safety	5.1	TF-9, TF-14, TF-17, IM-3, IM-4	TF-2, IM-18, IM-19, IM-20, TI-13
Emergency Vehicle Management	5.2	TF-9, TF-14, IM-1, IM-3, IM-4, IM-12	TF-2, TF-4, TF-8, IM-14, IM-17, IM-18, IM-19, IM-20, TI-2, TI-5
Advanced Vehicle Safety Systems			
		N/A	N/A
Information Management			
Archive Data Function	7.1	TF-14	TF-18, TF-19, IS-1, IS-2