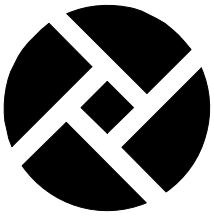
Systems Inventory Summary

- Draft -

Prepared for:

Port of Portland – Portland International Airport



Prepared by:

PB Farradyne

In cooperation with
Leigh Fisher Associates

and

Convergent Strategies Consulting

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1 Introduction

1.1 PURPOSE OF THIS REPORT

This is the first report developed as part of the development of an Intelligent Transportation Systems (ITS) Plan for the Portland International Airport (PDX). The ITS Plan will address the application of technology to improve customer service and airport systems efficiency as they relate to landside access and operations. The ITS Plan is being conducted as part of the broader PDX Technology Master Plan.

The inventorying and analysis of ITS infrastructure represents one of the initial steps in the definition of PDX's ITS architecture. This inventory identifies existing infrastructure that may provide the opportunity to enhance the safety and efficiency of a travelers trip to and from PDX. The inventory includes systems both on-Airport, owned and managed by PDX, and those that are located off-airport that are part of the regional freeway, arterial, and transit systems. Systems that are inventoried and analyzed include those owned and operated by PDX, as well as other transportation service providers in the Portland Metropolitan Area, including Oregon DOT (ODOT), Tri-County Metropolitan Transit Authority of Oregon (Tri-Met), and the City of Portland.

The inventorying and analysis process also provides the opportunity to define system functions and existing and potential opportunities for data exchanges among internal PDX systems and regional transportation partners.

1.2 WHAT IS ITS?

Intelligent Transportation Systems (ITS) are the application of advanced sensor, computer, electronics and communication technologies to maximize the efficiency and safety of transportation infrastructure. ITS have been widely deployed in the United States to enhance the safety and efficiency of transportation systems as it becomes increasingly difficult to add new capacity. Examples of ITS functions that are commonly deployed include:

- Detectorization of roadways for real-time monitoring of highways and surface streets
- Provision of real-time traffic flow information to travelers through various means such as Dynamic Message Signs (DMS), Highway Advisory Radios (HAR), the Internet, cellular telephones, and through the media
- Provision of real-time transit vehicle arrival and departure information at transit stations in both audio and visual formats
- Management of parking operations by providing real-time parking availability information to travelers through the use of space inventory systems
- Coordination of traffic signals along arterials to improve the flow of traffic and reduce motorist delay

1.3 WHY AN ITS ARCHITECTURE FOR PDX

An initial step in the planning and management of ITS deployments is the definition of an ITS architecture. An ITS architecture is a standard approach that defines the institutional and technical linkages necessary to plan, design, implement, operate and maintain ITS. To date there have been significant deployments of ITS in the Portland Metropolitan area, by ODOT, Tri-Met, and the City of Portland. One of the key benefits of developing an ITS architecture for PDX is expanding and enhancing opportunities to share information, both within PDX, and with other regional partners. Definition of these data sharing opportunities will help to better achieve a more seamless and effective transportation system for PDX travelers, who must use the regional transportation network to access PDX. Additional information about the National ITS Architecture, and conformity to it are provided in Appendix B.

1.4 ORGANIZATION OF REPORT

Sections contained in this report are described below.

Section 1 – Provides a high level overview of the National ITS Architecture

Section 2 – Identifies and characterizes existing data users and sources of data that supports travel to PDX

Section 3 – Defines existing and planned systems implemented and operated by PDX

Section 4 – Defines existing and planned systems implemented and operated by other regional transportation service providers in the Portland Metropolitan Area.

Section 5 – Identifies subsequent activities to be undertaken in the development of the PDX ITS Master Plan.

2 Existing Data Users and Sources

This section describes the existing data users and data sources that support travel to and from PDX as well as data from ITS sources supporting Airport operations, with an emphasis on landside operations. These data have been grouped into those that directly support customer service and ground transportation (or landside) operations, and those that indirectly support customer service and landside operations. The sources of data that directly support customer service and operations on the landside sector of the Airport are (1) traveler information, (2) parking access and revenue controls, (3) commercial vehicle management, and (4) traffic operations and management. Indirect sources include data from police, fire, and other transportation service providers including ODOT, Tri-Met, and the City of Portland.

2.1 TRAVELER INFORMATION

Airline passengers, visitors, employees, and others plan and conduct a safe, efficient and comfortable trip to and from PDX using traveler information. For airline passengers, PDX is just an inter-modal transfer point, not a final destination. Therefore, airline passengers often need information that will be assistance in the completing their entire journey from point-of-origin (e.g., place of residence or work) to final their final destination. Traveler information is intended to assist passengers:

- Select from the available travel modes, travel paths, and parking options at various points along their journey
- Recognize potential en-route delays or congestion points and identify alternative paths, or time of departure to PDX
- Decide on the swiftest or most reliable travel alternative
- Determine whether their arriving or departing flights are on-time

Traveler information should be available to passengers before they leave their home (or place of work), while they are en-route to PDX, and when they arrive, and/or before they depart.

2.1.1 Primary Categories of Traveler Information and Data Sources

The general categories of traveler information relevant to PDX passengers and visitors are listed below. The traveler information needs of PDX employees (including employees of the Port, the airlines, and other tenants) are not addressed in this section because their needs are comparable to those of other employees in the region. The general categories and available sources for traveler information are:

- Flight status - Passengers and visitors are typically advised to confirm the status of their flight prior to leaving home to avoid unnecessary delays at the airport. All of the scheduled carriers provide real-time arrival and departure times and often the arrival/departure gates via their toll-free telephone numbers and web sites. Flight arrival and departure times, and gate assignments are also available through the PDX-INFO automated telephone line (1-877-739-4636). The Port's Airport web site (*portlandairportpdx.com)* provides both the toll-free telephone number and a "hot-link" for all airlines serving PDX.

- Ground transportation services - Prior to leaving their home passengers select one of the available transportation modes as part of their initial trip planning. Passengers are more likely to use public transportation if they are aware of the potential options and can make informed decisions based on accurate data providing routes, fares and schedules or service reliability for the available transportation services. The Port's Airport web site provides a link to Tri-Met's web site that allows passengers to obtain information regarding Tri-Met bus and light-rail routes, fares and schedules. The Tri-Met web site also includes a trip planner that, for any origin-destination pair in the region, describes the available bus/rail routes, schedules, travel time, fares and allows the passenger to select a preferred itinerary. However, comparable data are not available for the Airport Downtown Shuttle or other privately operated shuttles. In some European communities, trip-planning software has been expanded to include paratransit services such as shuttles and executive car services. Other sources for these data (and reservations when necessary) include toll-free telephone numbers maintained by Tri-Met and the privately operated services.

- Parking availability and rates (by facility) - Passengers who decide to drive to and park at PDX use available Port-operated or privately operated off-airport facilities. Typically parking patrons select from the available options based upon information about space availability, costs, and convenience (e.g., waiting time for courtesy shuttle, walking distances, or availability of covered spaces. Much of this information is available through the PDX's web site (e.g., parking rates, general description of the parking garage, long-term lot, and economy lot, and location of Port-operated facilities). It is interesting to note that the web site also provides information on how to navigate the "roundabout" at the entrance to the Economy Lot. However, the web site does not provide advance information about parking space availability or allow patrons to reserve spaces. Current or real-time data describing space availability, parking rates, and directions to the lots is also available through the Port's PDX-INFO automated telephone line.

- Driving directions - Passengers unfamiliar with the Region or PDX may require driving directions to the terminal, parking or rental car facilities, or other areas (e.g., the air cargo or small package delivery sites). Driving directions are available from multiple sources including the Internet, and maps and directions provided by travel agencies and rental car companies, as well as the PDX-INFO automated telephone line.

- Travel conditions - Motorists can benefit from access to current or real-time information describing traffic conditions including delays due to incidents or construction, and advice on alternative routes to avoid congestion points. Transit riders can benefit from access to real-time information concerning expected travel times or waiting times, actual arrival times of scheduled vehicles, and information about system delays or service interruptions. This information helps the traveler assess the reliability of the travel alternative to be chosen. This information is now available (or will be available soon) from web sites maintained by ODOT and other agencies. Commercial radio and television stations also broadcast real-time traffic data. Data for certain road segments is available through toll-phone numbers. Information concerning construction delays on the Airport is available through the PDX-INFO automated telephone line.

- Ground transportation services at destination airport - As mentioned above, typically PDX is not a passenger's final destination. Most passengers decide how to travel from their destination airport to local destination prior to boarding an aircraft (or leaving home). Ideally, passengers would have access to such travel information for their entire trip via a trip planner comparable to the trip planner provided by Tri-Met. Alternatively, passengers can review data provided through web sites provided by other airport operators.

2.1.2 Traveler Information Required During Their Trip

The following paragraphs summarize the types of traveler information required or desired by PDX passengers and visitors at various points along their trip to and from the airport. The general types of information are relevant for all travelers, while the specific information required may vary by the passengers' familiarity with the region (i.e., resident vs. non-resident passengers) and trip purpose (business vs. non-business). The primary sources of these data are described in the prior section.

Prior to Leaving Home or Office

- Flight status (or delays) and gate number
- Ground transportation services for travel to PDX (and from destination airport to final destination) including communities served, routes, schedules, fares, and reservation number (if required)
- Parking information by facility, including availability of spaces, fees or rates, and directions
- Driving directions to PDX
- Travel conditions including expected travel times and real-time information regarding delays due to congestion, construction, or incidents

En-route to the Airport

- Real-time information about delays due to congestion, construction, or incidents and advisories as to alternative routes available
- Flight status confirmation

At the Airport—Enplaning Passengers (or Well-wishers)

- Terminal and airline information and directions
- Parking facility and space availability
- Flight status and gate number
- Ground transportation services at destination airport

At the Airport—Deplaning Passengers (or Meeters and Greeters)

- Flight status and gate number (for meeters and greeters)
- Baggage claim facility assignments
- Ground transportation services (e.g., communities served, fare and schedules, route information, travel time and directions to stop or station)
- Driving directions to off-Airport destination
- Travel conditions including expected travel times, and roadway congestion

After leaving PDX, the traveler information needs of passengers and visitors are similar to other motorists and transit passengers served by regional ITS initiatives.

2.2 PARKING MANAGEMENT

Parking access and revenue control (PARC) data are used by landside management to (1) monitor the availability of parking spaces in the individual parking facilities or garage levels, (2) monitor the status and functioning of parking access and revenue control system components, (3) audit parking revenues, and (4) review the performance of the parking staff, management

personnel and facilities. Data required and used to operate and maintain the parking facilities at PDX and the primary sources of these data include:

- Real-time inventory of available spaces by location - Space inventory data is used by landside management to determine the number of remaining available spaces, and to determine when to open or close a lot, and anticipate when a lot may need to be closed. The information can be communicated to parking patrons through the use of (1) parking attendants to direct patrons to hard-to-find empty spaces, (2) dynamic message signs located at the entrance to the Airport, parking facility or garage level, or (3) highway advisory radios or toll-free telephones.
- Parking revenue reports - The PARC system provides data indicating the amount of revenues collected by location (e.g., lot, garage, exit lane) and by time (e.g., hour, day, month) and can be sorted by various measures. These data are used to (1) analyze or audit revenues by ticket, by facility, by length of stay, by exit lane, by hour, day or month, or various other categories, (2) plan staff resources and monitor staff performance, and (3) monitor operations of the facilities and the parking management contractor.
- Parking revenue control equipment status - The PARC systems are used to monitor the status of each system component (e.g., when a lane is opened or closed), equipment malfunctions (e.g., a ticket caught in throat of issuing equipment), or maintenance needs (e.g., refill ticket bins or reset gate arms).
- Overnight inventories – Overnight inventory data (the number of vehicles parked in each facility at midnight, and the license plate numbers of these vehicles) provide a database of the vehicles remaining in the facilities for more than 24 hours to discourage fraud and ticket swapping, and can be used to help customers find lost vehicles.
- Video surveillance – Approximately 70 closed circuit cameras are installed in the parking garage for security purposes. The information recorded on cameras can be reviewed after the fact for security and theft detection purposes. These images are not monitored on a real-time basis.
- Employee parking lot data – Employee parking control systems allow management to determine the number of available spaces, restrict improper use of employee access cards, and perform other management audits. When the employee lot is relocated to the southern end of the Portland International Center later this year, access will be controlled by the new parking and access revenue control system
- Shuttle bus operation data - Shuttle bus operations (e.g., locations, headways between successive vehicles, and the need to insert or remove buses from a route) are monitored and controlled by dispatchers who communicate with drivers via radios.

2.3 COMMERCIAL VEHICLE MANAGEMENT

Landside management is responsible for managing, monitoring and controlling commercial vehicles and dispatching certain vehicles. The data and data sources required and used to perform these tasks include:

- Number of waiting taxicabs - To manage and dispatch taxicabs it is necessary for management (or their representatives) to (1) know the number of taxicabs waiting for customers at the curbside, (2) instruct authorized taxicab drivers waiting in the hold lot to proceed to the commercial lane, and (3) to communicate special requests to taxicabs, limousines, and vans waiting in the hold lot. Taxicab drivers are instructed to proceed from the hold lot to the commercial lanes using bell and light signals. Special requests and other commercial vehicle call-ups are accomplished using a variable message sign (VMS) with a

15-minute message scroll. Management also needs to know when there are insufficient taxicabs waiting in the hold lot to accommodate anticipated passengers needs in order to request additional taxicabs through the taxicab company dispatchers.

- Vehicle schedules - Management (or their representatives) are responsible for monitoring the operations of privately operated scheduled vehicles to assure that they adhere to advertised schedules. These data can be gathered by manual counts, or use of a properly functioning automatic vehicle detection or identification system.
- Vehicle trips and dwell time – To monitor and control the commercial vehicle roadway and passenger loading areas, landside management uses an automatic vehicle identification (AVI) system to record the number of vehicle trips made by each commercial vehicle and charge the operators of these vehicles calculated based on the number of trips made, with the fees varying by vehicle weight class. Other methods to manage curbside congestion include monitoring the dwell times of individual vehicles and charging a penalty or overtime fee. A proximity card reader with a gate arm to control access is used at PDX to monitor the commercial roadway and calculate fees on a per-trip basis.
- Vehicle permit status - To operate at PDX, commercial vehicle operators are required to obtain and maintain specific insurance coverage; and, vehicle and operator permits from State, other agencies, and Port. To control commercial vehicle operations, landside management (or their representatives) requires access to data indicating the status of these permits and insurance certificates.
- Driver status – Commercial vehicle drivers are required to provide certain information to the Airport in order to receive a permit and badge. This information includes the company name, results of a criminal background check, and a valid commercial drivers license. There is a desire to create an electronic database for driver information.
- Billing status – Commercial vehicle operators are required to pay certain permit and per-trip fees established by the Port. Management (or their representatives) required access to data indicating identify any delinquent operators (i.e., have fees outstanding for more than 30 days).

2.4 ROADWAY TRAFFIC OPERATIONS AND MANAGEMENT

Airport and landside management are responsible for monitoring traffic and operations on Airport access, circulation, and curbside roadways and enforcement of rules and regulations to assure the safe and efficient use of PDX facilities. To maintain the desired levels of service, management needs to know, as quickly as possible, the (1) locations and causes of traffic congestion, accidents or incidents, and construction activity. Access to such data is particularly important for sustained congestion or major incidents that may restrict access to the terminals, curbsides, parking or other facilities. Typically, short-term or interim congestion occurring on the curbside roadways or commercial vehicles lanes is appropriately the responsibility of traffic control officers, passenger service agents, and other staff responsible for patrolling these areas. However, when congestion occurs, Airport and landside management need to know the location and cause of the congestion in order to develop the appropriate response. Data indicating the location and causes of incidents, congestion, and construction activity can be obtained through video surveillance cameras, pavement-mounted or overhead vehicle detectors, and reports from Airport police and maintenance staff. Advisory messages can be communicated to motorists through dynamic message signs, highway advisory radio messages, traffic officers, and other media.

2.5 OREGON DOT

ODOT will primarily be concerned with network status information as it pertains to ground access to PDX. ODOT has demonstrated interest in this by deploying CCTV cameras and ramp metering stations at the I-205/NE Airport Way interchange. Additionally, ODOT may be interested in receiving incident data so that it can be communicated to COMET vehicles for tactical operations.

2.6 TRI-MET

From the perspective of transit service provider, Tri-Met will need to obtain any information related to terminal and/or ground access operations that impact their service. For example, Tri-Met would need to know of terminal closures in the event of an emergency (e.g., bomb scare) so they can suspend service to the terminal. In addition, Tri-Met will need to know of any incidents that will disrupt ground access. This could include accidents on the roadway or problems at the highway-rail intersection (NE 82nd).

2.7 CITY OF PORTLAND

The City of Portland will need to obtain data related to the status of their traffic signal located at NE Airport Way and NE 82nd.

3 Existing and Planned PDX ITS Infrastructure

The following defines systems that have been implemented by PDX that should be considered in the development of the ITS architecture.

3.1 CLOSED CIRCUIT TELEVISION SYSTEM (S)

The closed-circuit television (CCTV) system consists of a (a) controller, which allows manual camera call-up and pan-tilt-zoom control, and monitor selection, (b) fifteen monitors, two of which are dedicated to monitoring the roadways. The CCTV system provides surveillance capability and monitoring of activity or incidents throughout the parking garage, airport terminal, apron, and roadways.

3.2 MULTI-USER FLIGHT INFORMATION DISPLAY SYSTEM

These systems provide (a) flight arrival and departure status to the traveling public through out the terminal, and (b) flight operations information used by operations staff of the some of major airlines. The input data are obtained from the airlines via host links or manual input, in the case of United and Delta airlines

3.3 BAGGAGE INFORMATION DISPLAY SYSTEM

The Baggage Information Display System (BIDS) provides information to the traveler regarding the arrival of inbound baggage and the assigned display unit. Information is displayed on monitors in the baggage claim area adjacent to each display unit. BIDS information could also be displayed on the FIDS workstations, traveler information kiosks, and via the Internet. Input data is controlled by airline baggage handlers from devices located adjacent to the baggage belts.

3.4 LOCAL AREA NETWORK

The local area network is token ring-based and is consistent with the other local area networks serving the Port. The Port is in the process of migrating from a Token Ring to an Ethernet local area network.

3.5 TRANSPORTATION DISPATCH SYSTEM

The transport dispatch system provides communication between the Starters Booth located at the Commercial Roadway and staging area for the dispatch of taxicabs, limousines, chartered

buses, and other commercial vehicles. Using a dynamic sign located in the staging lot, dispatchers can signal the appropriate driver(s) and direct them to proceed to the Commercial Roadway, or to direct limousine and charter buses to contact the Starters Booth via their cellular telephone or white courtesy phone. The transport dispatch system includes a computer in the Starters Booth that is used to check-in pre-arranged charter vehicles, and confirms the departure schedules of buses and vans.

3.6 TRAVELERS INFORMATION SYSTEM

The existing travelers information system, which is to be replaced, is a graphic interface, interactive type system designed to provide passengers and visitors with information regarding the Airport, "you-are-here", airline information and other data. Graphic interactive self-instructing video display terminals are located through the terminal. Data from the travelers information system is also available over the Internet. Data are input and maintained by Airport staff and electronically from the airlines (e.g., flight schedules and gate assignments).

3.7 INTERACTIVE VOICE RESPONSE SYSTEM

The Interactive Voice Response System is an automatic telephone/radio information system that provides public access to near real-time PDX information including parking garage status (i.e., availability of spaces by level) and flight information, and provides access to the emergency notification system (or paging). Parking garage status is imported to the system via an interface from the Parking Inventory System. Users gain access to the available data by using their telephone keypad to step through the menu-driven options.

3.8 EMERGENCY NOTIFICATION SYSTEM

The emergency notification system provides automatic telephone dialing call-out functions to provide notification of emergency events to various PDX staff. Upon selection of particular list, the system dials the telephone and/or pager number of the each person or personnel resource on the list. When they respond to the call, staff is provided specific information regarding the incident. The system also provides call back logging.

3.9 PARKING STRUCTURE INVENTORY SYSTEM

The parking structure inventory system indicates the availability of parking spaces in each level of the Airport parking garage. As loop detectors imbedded in the pavement record vehicles, the system subtracts entering vehicles (and adds exiting vehicles) to the available inventory and displays the appropriate "full" or "open" message on dynamic signs at the entrance to each level of the parking garage. The data are also transmitted to the Interactive Voice Response System.

3.10 RADIO SYSTEM

PDX's radio system is a trunked system with three primary channels. The system, which is shared with the Air National Guard, provides communications for the following seven talks groups: airfield operations, police dispatch, fire dispatch, incident command, landside operations, maintenance, and PCR.

4 Existing and Planned Regional ITS Infrastructure

The following defines planned and existing ITS infrastructure in the Portland Metropolitan Area that can enhance the safety and efficiency of travel across the region and to and from PDX. These systems are owned and operated by regional transportation partners including Oregon Department of Transportation (ODOT), City of Portland, and Tri-Met

4.1 ODOT

The following defines the functions and locations of ITS infrastructure owned and operated by ODOT in the Portland Metropolitan Area.

4.1.1 Traffic Management Operations Center (TMOC)

ODOT's TMOC serves as a focal point traffic operations in the Portland Metropolitan Area. The TMOC, opened in 1997, operates 7 days a week, 24 hours a day. Functions supported by the TMOC include:

- Detect incidents
- Control and operations of CCTV's
- Monitor the prevailing situations
- Communication and coordination among incident responders, including police, fire, EMS, COMET vehicles, and towing operators
- Dissemination of information to travelers and the media
- Control and operations DMS
- Control and operation of traffic signals

4.1.2 TransPort 2000 ATMS Software

ODOT has implemented Georgia Department of Transportation's (GDOT) ATMS software to control DMS, CCTV and ramp meters. ODOT's implementation of the GDOT's software is referred to as TransPort* ATMS and provides the platform for a regional integrated ATMS. Currently TransPort 200 provides the following functionality:

- CMDA – Changeable Message Sign. Allow operators to post messages on any of DMS owned and operated by ODOT in the region.
- CMDM – Automatic Congestion Management. Constantly monitors speeds downstream from DMS. Systems uses speed data to calculate travel times.
- INDD – Automatic Incident Detection. This function works by constantly monitoring data from detectors at ramp meter stations. The software then compares existing speeds and volumes with historical data and with upstream and downstream detectors to determine abnormalities in flows.
- INM – Incident management operators use software to track incident details throughout duration of the incident.

* For informational purposes, TransPort (**Trans**portation **Port**land) is a multi-jurisdictional effort to relieve traffic congestion.

- RSPM – Response Plan Management. Provides guidance on response activities based on variables of the individual incidents. This includes whom to contact, what message to display on the DMS. In the future the system will also be able to control ramp meters during incidents.
- VIDS – Video/Audio Server (CCTV). Allows full pan/tilt/zoom control of all CCTV's, and selection of camera images to view.

4.1.3 Dynamic Message Signs

ODOT currently owns and operates 14 DMS in the Metropolitan Portland Area. DMS are used to provide travelers with real-time traffic information. DMS messages are controlled by the TMOC. DMS currently deployed, or are planned for near-term deployment in proximity to PDX include:

- I-84 between NE 122nd and NE 147th (WB)
- I-84 east of 201st Ave (EB)
- 1-205 south of I-84 (NB)
- I-205 south of Oregon 212 (NB and SB)
- I-84 at NE 21st (WB)
- I-84 at NE 47th (EB)

4.1.4 Closed Circuit Television

Currently ODOT has deployed 50 CCTV's in the Portland Metropolitan Area, with another 12 currently under construction. CCTV's are controlled through the TMOC. CCTV's are used to send real-time images of traffic and incident conditions to assist ODOT in making tactical operational decisions, and dispatch the appropriate response agencies. CCTV locations in proximity to the airport include:

- I-205 at NE Prescott St.
- I-205 at Government Island
- I-205 at Columbia Boulevard
- I-205 at Airport Way NE
- I-205 at Government Island
- I-84 at NE 82nd
- I-84 at NE 67th
- I-84 at I-205
- I-84 at Halsey (2)
- I-84 at 105th
- I-84 at 102nd

ODOT also has agreements with four Portland area TV stations (2,6,8 and 12) to exchange video signal for their cameras. Many of these cameras are positioned in a manner that enables them to be focused on the freeway system. Additionally, there are two cameras attached to helicopters owned by the TV stations. In all, these cameras provide an additional 14 cameras to the system. Images provided by ODOT-owned cameras are communicated back to the TMOC via the fiber optic network. Figure 4-1 shows a CCTV image available to travelers via tripcheck.com.

Figure 4-1: CCTV image provided via tripcheck.com

4.1.5 Ramp Meters

There are currently approximately 90- ramp meters implemented in the Portland Metropolitan Area. Each ramp meter uses 170 controllers and Wapiti software. Ramp meters are controlled by the TMOC. TransPort current software will be updated to allow ramp meter functionality to better meet the operational needs of ODOT Signal Managers, and to integrate CalTrans System Wide Adaptive Ramp Meter (SWARM) ramp module into TransPort. Ramp meter stations have been built at I-205 and NE Airport Way. However, these are not currently operational.

4.1.6 COMET Incident Response Vehicles

Corridor Management Teams (COMET) are motorist assistance vehicles that regularly patrol the freeway system in Portland. COMET vehicle operators assist motorists with disabled vehicles. Typical services provided to motorists include providing fuel, fixing flat tires, or pushing the disabled vehicle from the roadway. COMET vehicle operators also assist in incident management focusing their efforts towards providing a coordinated effort for safe and efficient traffic flow around the accident / incident. In addition, COMET vehicles are equipped with Orbital Sciences GPS transponders that enable them to serve as surveillance probes. Facilities that COMET vehicles are responsible for patrolling include:

- I-5
- I-84
- I-205
- I-405
- Highway 217
- Highway 26

4.1.7 Roadway Weather Information System

ODOT is deploying a network of weather stations throughout Oregon that are providing much needed weather and pavement condition information. These stations are unmanned and linked to the ODOT network and the information is provided to travelers via Tripcheck.com.

4.1.8 Tripcheck.com

Tripcheck.com is ODOT's traveler information website. Tripcheck.com features include:

- Roadway incident maps showing where roadway incidents have occurred, and an estimate of the delays involved. Includes information about trucking restrictions & closures.
- Mileage calculators for estimating travel distances.
- A "Custom Cam" page that allows you to select any 5 roadway camera images and create your own custom road cam page. You can create as many pages as you wish.
- ODOT/OSP road conditions report giving you recent regional weather and road surface conditions for sections of ODOT maintained roadway.
- A text-based travel information page called QuickCheck, which provides text links to road cams, special bulletins, and ODOT/OSP road and weather reports.

Figure 4-2: shows the map used to select images using the "Custom Cam" page.

Figure 4-2: Tripcheck.com "Custom Cam" page

4.1.9 Regional Communications Network

The current communications system utilized by ODOT to communicate with field device is a hybrid system that employees a variety of mediums including:

- Fiber optic cable
- Leased telephone lines
- Twisted pair (copper wire)
- Coaxial cable
- Radio communications

The fiber optic cable is used to transmit video images from the field to the TMOC, and control some of the DMS. Currently ODOT has fiber-optic cable in their right-of-away along I-205 to the NE Airport Way interchange. However, currently there is no connectivity to PDX. In addition, there is fiber optic cable in the Tri-Met right-of-way.

4.2 TRI-COUNTY METROPOLITAN TRANSIT AUTHORITY OF OREGON

Starting in September 2001 Tri-Met's light-rail system will expand service to PDX. This service is called "AirMax". The route will go from the Gateway Transit Center along I-205 to the just south of baggage claim in the PDX terminal. The system extension will include 4 new stations, including Parkrose/Sumner, Mt. Hood Avenue, Cascades and the airport terminal.

When the system is operational it is planned that trains will leave the terminal at PDX every 15 minutes. In the interim while the system is being developed, Tri-Met provides bus service to PDX via the 12/Sandy Blvd.

Currently Tri-Met provides a variety of MAX service information via their website. Information provided via Tri-Met's website includes:

- MAX time tables and closure information
- Bus route and connection information
- Transit center and park and ride locations
- Service area maps

Figure 4-3: shows a service area map provided to travelers via Tri-Met's website.

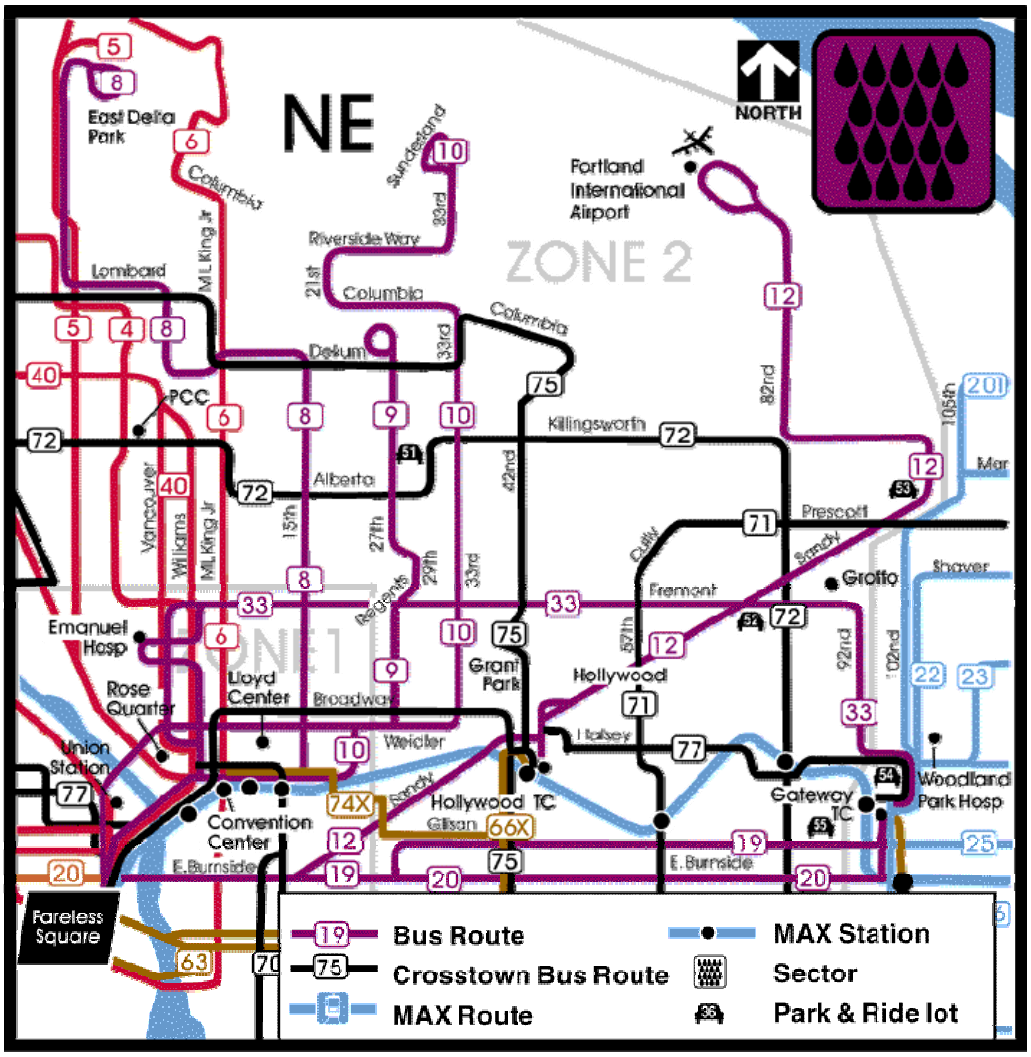

Figure 4-3: Tri-Met service map

4.3 CITY OF PORTLAND

The City of Portland currently operates a Traffic Operations Center (TOC) in the Portlandia Building. The facility is primarily used to control the City's centralized signal system and operate CCTV's. The system provides a graphical user interface for both of these control functions. The City also operates the traffic signals at NE Airport Way and NE 82nd.

5 Next Steps

Subsequent activities that will be undertaken in the development of the ITS Master Plan for PDX are described below.

5.1 USER NEEDS DEFINITION

A critical step in identifying potential ITS solutions, and developing the ITS architecture will be defining user needs. User needs will be defined through a process that includes:

- One-on-one interviews
- Telephone interviews
- Stakeholder workshop

The focus of these efforts will be to assess existing and desired data needs, the usefulness of existing reports, desire for new formats and communications, and measures to share available data. In addition, the needs of the traveling public with respect to ground transportation and parking information both on and off the PDX. Those taking part in outreach efforts include representatives from Aviation Operations, Ground Transportation Operations, parking operations Aviation Planning, Engineering, Finance, Information Technology, and Port Police. Additionally, regional stakeholders such as Tri-Met, ODOT, and City of Portland will be involved in the user needs definition.

In addition to outreach efforts, the following reports will be reviewed to identify any additional needs:

- PDX Master Plan Update
- PDX Right of Way study
- Other documentation of regional ITS initiatives

5.2 ITS SOLUTIONS AND PROJECTS DEFINITION

Based on user needs identified through outreach efforts, potential ITS solutions will be defined for PDX. To the extent that independent recommended ITS technologies will address the benefits of integrating various technology subsystems to maximize efficiency of data flow. This will also consider other regional ITS initiatives. ITS solutions will be prioritized with the input and direction of the PDX, and the benefits of phasing of implementations will be addressed.

Based on stakeholder input, priority ITS projects will be identified for near-term deployment. From this a list of detailed project descriptions of these projects will be developed. Potential ITS projects will be defined in terms of:

- Functional description of system
- Objective of system deployment
- Recommended plan for deployment
- Potential benefits of system deployment
- Potential risks associated with system deployment
- Affected stakeholders

- Data requirements
- Estimated system deployment and operations costs
- Related work

5.3 ITS ARCHITECTURE DEFINITION

As described in Section 1.3, a critical initial step in the planning and management of ITS deployments is the definition of an ITS architecture. The PDX ITS architecture can foster the inter-operability of ITS systems and exchange of data across jurisdictions and other ITS services that may already exist or be implemented in the future. By identifying the inter-relationships of existing, planned and future ITS projects, PDX's ITS architecture will also foster the implementation of ITS without losing the investment in deployed systems when future systems are developed and implemented.

Appendix A - References

1. Oregon Department of Transportation Region 1 – Intelligent Transportation System Implementation and Operations Plan. DKS Associates, April 2000.

2. Portland International Airport – Airport Operations Center Technology Assessment. Ross & Baruzzini, September 1,2000.

3. Airport Way Right-of-Way (ROW) Concept Study. P&D Aviation, October 22, 1999.

4. http://www.tripcheck.com/

Appendix B – Conformity to the National ITS Architecture

B.1 WHAT IS THE NATIONAL ITS ARCHITECTURE?

To assist agencies in the development and deployment of ITS, the U.S. Department of Transportation has developed the National ITS Architecture. The National ITS Architecture provides a common framework for determining ITS solutions and implementing ITS technologies. The National ITS Architecture is not a design, rather it defines the framework around which multiple design approaches can be developed, each one specifically tailored to meet the unique needs of a region. The National ITS Architecture also defines the functions that must be performed to implement a given service, the physical entities or subsystems where these functions reside, the interfaces/information flows between subsystems, and the communication requirements for the information flows.

B.2 CONFORMITY TO THE NATIONAL ITS ARCHITECTURE

A key benefit of developing an ITS Architecture for PDX is to address the intent of the National ITS Architecture and Standards Conformity Final Rule. Section 5206 of the Transportation Efficiency Act for the 21st Century (TEA-21) requires that ITS projects funded through the Highway Trust Fund (including the Mass Transit Account) conform to the National ITS Architecture and Standards. In response to this requirement, the FHWA rule and FTA policy on Intelligent Transportation Systems (ITS) Architecture and Standards were issued on January 8, 2001, to implement section 5206(e) of the Transportation Equity Act for the 21st Century (TEA-21).

The basis for the final rule is to ensure that current and future opportunities to integrate ITS across modes and jurisdictions for the purpose of improving transportation operations are not overlooked in the project development process. Further, the rationale for this requirement is to ensure key ITS projects and initiatives are targeted early in the planning process to facilitate more effective integration. Conforming to the National ITS Architecture provides PDX with the potential opportunity to obtain Highway Trust Funds, whether individually, or in concert with other regional partners to deploy ITS to enhance safety and efficiency in travel to PDX.