Chapter 2: User Needs Assessment

2.1 INTRODUCTION

This chapter provides a summary of transportation system user needs for Deschutes County gathered from project stakeholders through personal key stakeholder interviews, expanded stakeholder mail-out questionnaires, and an expanded stakeholder workshop. In addition, this chapter also includes a summary of the interviews and questionnaires including an assessment of regional strengths, weaknesses, opportunities, and challenges. The assessment of current and future transportation user needs in Deschutes County provides a backbone for the development and evaluation of potential ITS projects.

The *Stakeholders and System Users* section includes details from the interviews, questionnaires, and workshop. The *Summary of User Needs* section highlights the user needs identified by stakeholders organized by the following areas of interest:

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

2.2 STAKEHOLDERS AND SYSTEM USERS

To ensure the success of the *Regional ITS Operations & Implementation Plan for Deschutes County*, a coalition of stakeholders and system users was created to gather input and build consensus. Personal interviews with key stakeholders targeted numerous subjects, while mail-out questionnaires focused primarily on gathering the big picture user needs from expanded stakeholders. A workshop was held after the completion of the interviews and questionnaires with both the key and expanded stakeholders to discuss and verify the transportation needs that had been identified and to determine any additional needs.

2.2.1 Personal Interviews

Key stakeholders with decision-making authority regarding matters such as ITS implementation and institutional coordination were interviewed personally. The interviews were conducted to identify user needs, regional transportation problems, institutional relationships, and obstacles to ITS implementation. Each interview lasted approximately one to two hours and Appendix D includes the notes taken during the interviews. One or more representatives from the following seven agencies were interviewed:

- Oregon Department of Transportation (ODOT) Region 4
- City of Bend
- Deschutes County
- Bend Metropolitan Planning Organization (BMPO)
- Oregon State Police
- City of Redmond
- Deschutes County 911

2.2.2 Mail-Out Questionnaires

Questionnaires were e-mailed the project's expanded stakeholders to determine user needs and problems of the transportation system. The questionnaire was sent to public agencies indirectly involved with the project, private companies in the study area, and selected representatives of the general public. Overall, questionnaire recipients included the following:

- Bend Chamber of Commerce
- Central Oregon Intergovernmental Council (COIC)
- Central Oregon Visitors Association
- City of Sisters
- Commute Options for Central Oregon
- Deschutes County Fair and Expo Center
- High Desert Education Service District
- Mt. Bachelor, Inc.
- Redmond Chamber of Commerce
- Sunriver Chamber of Commerce
- Sunriver Resort
- US Forest Service

Of the approximately 12 questionnaires sent out, one was completed and returned and can be found in Appendix E along with a complete list of questionnaire recipients.

2.2.3 User Needs Assessment Workshop

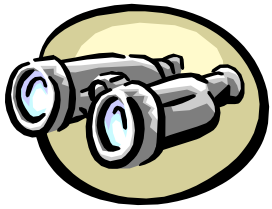
A user needs assessment workshop was conducted with key and regional stakeholders to discuss and finalize the list of transportation user needs for Deschutes County transportation system. User needs documented from the interviews and questionnaires were discussed and additional needs were identified. The focus of the workshop was to reach consensus from all stakeholders regarding the regional transportation user needs.

The workshop included a short presentation that provided project background information, an overview of the plan process, general ITS uses, and a summary of the stakeholder interviews and questionnaires. Participants were then able to provide input at the following three poster sessions:

- Travel & Traffic Management/Emergency Management/Incident Management
- Traveller Information/Information Management
- Public Transportation Management/Maintenance & Construction Management

At the end of the meeting, a representative from each poster session reported back to all participants and additional group discussion will be held to finalize the user needs. Appendix F includes the workshop invitation, presentations, handout, and meeting minutes.

2.3 PROJECT MISSION, GOALS, AND OBJECTIVES

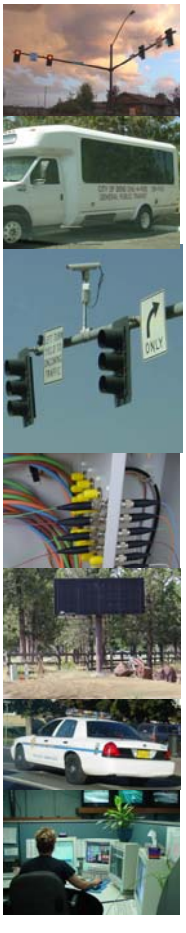


To guide the development and ultimate deployment of intelligent transportation systems in Deschutes County, key project stakeholders developed a mission statement and accompanying goals and objectives.

2.3.1 Mission Statement

Deschutes County seeks to improve the safety, security and movement of goods, people, and services for all modes of the transportation network by using advanced technologies, establishing agency coordination, utilizing exiting system capacity and infrastructure, and providing real time traveler information.

Goals



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

Objectives

- Reduce emergency response times.
- Reduce frequency, duration, and effects of incidents.
- Coordinate incident/security response with other local and regional agencies.
- Coordinate evacuation strategies with other local and regional agencies

2) Improve the efficiency of the transportation system.

Objectives

- Optimize travel time for all transportation system users, including future transit vehicles, commuters, freight, and tourists.
- Reduce travel time variability.
- Reduce fuel consumption
- Reduce environmental impacts.
- Increase vehicle occupancy.
- Improve maintenance and operations efficiencies.
- Reduce Vehicle Miles Traveled
- Coordinate ITS efforts with existing and future TSM and TDM efforts.
- Provide weather information to transportation agencies to coordinate snow and ice removal.

3) Provide improved traveler information.

Objectives

- Provide real-time traveler information for all users of the transportation system.
- Provide real-time road condition and weather information at key regional facilities.
- Provide advance and real-time information about construction activities and work zones.
- Provide real-time incident information.
- Disseminate regional and local traveler information by a variety of media.
- Provide traveler information prior to travel decision points.
- Provide one central location for dissemination of al regional and local traveler information.

4) Develop and deploy cost efficient ITS infrastructure.

Objectives

- Deploy systems that are integrated with existing ITS infrastructure.
- Deploy systems that are integrated with future transportation infrastructure improvements.
- Deploy systems with a high benefit-to-cost ratio.
- Deploy systems that maximize the use of existing infrastructure.
- Integrate deployments with other local and regional projects.
- Coordinate funding opportunities.
- Coordinate deployment with existing plans.

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

Objectives

- Build consensus among the Steering Committee members.
- Share infrastructure resources between local and regional agencies.
- Continue to coordinate and integrate projects with other agencies within Deschutes County and Central Oregon.
- Create and build public and private partnerships for ITS deployment, operations, and maintenance.

6) Monitor Transportation Performance Measures.

Objectives

- Develop a transportation database accessible by all local agencies.
- Collect and record transportation data, such as traffic volume, speed, loop occupancy, and incident data.
- Maintain a GIS database of the transportation infrastructure, including ITS devices.

2.4 SUMMARY OF USER NEEDS

This section contains paraphrased statements that summarize the user needs gathered from the interviews, questionnaires, and workshop. User needs are categorized by the following areas of interest: Travel & Traffic Management, Public Transportation Management, Emergency Management, Information Management, and Maintenance & Construction Management. Some needs may apply to multiple categories and any similar user need statements are likely the result of comments from separate stakeholders. The transportation user needs contained in this section will be mapped to the national ITS architecture user services (Chapter 3) prior to determining applicable ITS projects for Deschutes County.

2.4.1 Travel and Traffic Management

This section summarizes travel and traffic management user needs and deficiencies by the following areas of interest: traffic operations and management, incident management, special events, and traveler information.

2.4.1.1 Traffic Operations & Management

- Need the ability to collect and disseminate real-time traffic conditions information.
  - 14-hour counts
  - Peak-hour turn movement counts
  - Link counts (tube counts)
  - Loop counts (data compatibility)
  - Counts by day of week and month of year
- Need remote, continuous access to traffic signals (data, status, control).
- Need to coordinate adjacent traffic signals within a corridor.
  - Need to address the closely spaced signals on 27th Street.
  - Need to address signal transitions during a RR priority call.
- Need a common system software package to access remote field devices (traffic signals, DMS, CCTV, RWIS).
- Need automated congestion/incident detection.
- Need the ability to automatically identify signal detector failure and alert operations personnel – Translink does not currently provide this.
- Need the ability to collect the preemption data, power failures, and monitor signal status/condition (to reduce times sending staff into field).
- Need automated traffic count data (turn movement and ADT).
- Need to view video from video detection remotely.
- The Parkway (Highway 97) needs video with pan/tilt/zoom capability. Traffic Operations Center (TOC) needs access to the video and control.
- Need a complete map of interconnect and available conduit.
- Due to huge growth expected, need to optimize the existing system capacity.
- Need a proactive approach to operations – plan for signal systems and coordination needs.
  - Need adaptive controls that can adapt to street closures, parades, etc.

- Need to update the Downtown Bend signal system, which does not have detection, interconnect, Opticom, or pedestrian push-buttons.
- Need ITS devices to be specified for NTCIP protocol so multiple vendors can provide products that are accessible via a single software package.
  - Need to assess new technology/devices for compatibility with current systems.
- Need to institutionalize cooperation/coordination for addressing operations complaints.
- Century Drive to Mt. Bachelor needs enforcement for passing areas, traction tire compliance, and vehicle speed.
  - Need education on tire traction laws – simpler language.
  - Increase patrol staffing.
- Need automated downloads of traffic counts from signals.
- TOC operators need access to signal status and potentially some control.
- Need communications infrastructure design standards.

2.4.1.2 Incident Management

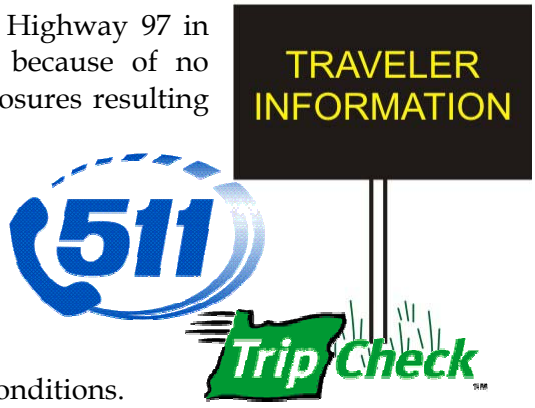
- Need automated incident detection.
  - Need to detect flooding of RR undercrossings at 3rd and Greenwood – automated detour.
- Need automated vehicle height detection warning system for 3rd RR undercrossing.
- Need to address the lack of alternate routes for Highway 97.
- Need to communicate alternate routes to public, emergency responders, and media.
- Need to reduce weather related incidents.
- Need to provide advanced information to travelers (Century Drive, Lava Butte).
- Need to improve safety for incident responders.
- ODOT dispatch/operations center could use access to traffic signal status information.
- PTZ (pan-tilt-zoom) cameras are needed for incident management.
- Stalled vehicles on the Parkway cause delay because there are no shoulders to pull out.
- Provide video of incident and congestion information.
- Need to provide incident responders/dispatchers with advanced information about an incident to send the right personnel and/or to avoid sending personnel unnecessarily.
- Need to provide incident responders advanced information about the condition of a collision and status of people involved (e.g. are they walking around or is it likely an injury accident).
- Provide an interface between the Oregon State Police (OSP) CAD system and PSSI CAD to manage incidents.
- Need to be able to divert traffic BEFORE the problem area.
- Need digital video in OSP cars – keeps officers out of court.

2.4.1.3 Special Events

- Need to consider Traffic Control Plans for the fairgrounds.
  - Deschutes County Fair.
  - Family Motor Coach Association in Redmond (The fairgrounds is a big RV parking lot).
  - Need public transportation (shuttles) between the fairgrounds and Bend/Redmond hotels.
- Need to consider a Traffic Control Plan for Sisters Rodeo.

2.4.1.4 Traveler Information

- Need to provide real-time, accessible traveler information.
  - Need Trip-Check information at key locations for travelers (e.g. new Bend parking garage, airports).
- Need to provide traffic condition information at key traveler decision points.
  - Need to identify the safest mountain pass (Santiam vs. Mt. Hood).
- Need to provide video images of roadway conditions
- Need to provide weather condition information to public and operations/maintenance personnel
- Need a central source for construction information
- Lava Butte is a frequent weather related problem area.
- Need to provide information to travelers through common media (e.g. TV, radio, phone, Internet) plus en-route information.
  - Need 511 local information.
  - Need one broadcast with weather, incident, and construction updates.
- Need remotely changeable 'chain-up' signs.
- Need to provide en-route traveler information on Highway 97 in LaPine. NB sign was planned but not put in because of no alternative routes. Could be useful during road closures resulting from evacuations.
- Need to have complete visual coverage over the passes.
- Need to be able to provide advanced information to travelers on Hwy 97 and Hwy 20.
- Need a camera @ S. Century & Century Dr. (There is no power or phone).
- Travelers need access to visual images of roadway conditions.



2.4.2 Public Transportation Management

Stakeholders identified the following public transportation management needs:

- Pass November ballot for a transit district
- If fixed bus routes are established the following needs apply:
  - Need to encourage ridership
  - Need to maintain transit travel time reliability
  - Planned bus equipment includes security cameras, GPS/AVL, MDTs, Interactive Voice Recognition, radios.
  - Need to do transit priority at signals to maintain travel time reliability.
  - Need to provide transit arrival information at bus stops and pre-trip.
- Need to support special events (County fairgrounds could use some support).
- Need to run a demand response system that maps and schedules pickups (Trapeze).
- Need to encourage ridership on transit service to Mt. Bachelor to reduce problems on Century Drive.
- Need to collect ridership data – day of week and time of day.
- Need to integrate fare payment with parking garage card.

2.4.3 Emergency Management

This section describes emergency management needs related to operations and communications.

2.4.3.1 Emergency Management Operations

- Need to provide real-time traffic condition information at 911 centers and in vehicles.
- Need to provide real-time incident information at 911 centers and in vehicles.
- Need to enhance operations during major emergencies (winter weather, floods, fires, etc.)
- Need to enhance transportation management during evacuations.
- Preemption should be provided only for valid vehicle identification.
- Need to reduce emergency response times. Consider improvements for travel time through roundabouts.
- Need to provide advanced information about incident conditions (injury, severity, etc.)

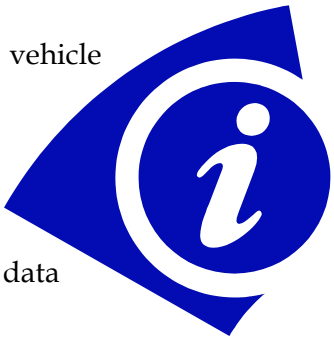
- Provide advanced information about rail crossings being occupied for fire response and/or during an evacuation.
- Need to provide evacuees with good information about the evacuation route.
- Need to bring mapping/GIS to the dispatch consoles.
- Need road condition information/video available at the EOC.
- Need driver education at roundabouts for yielding to emergency vehicles.

2.4.3.2 Communications

- Need a common emergency radio channel during incidents.
- Consider expanding the initial deployment of wireless for communications to field devices.
- Radio system needs upgrading since OSP is not able to communicate with the Sheriff and City Police.
- Need to provide incident information to responders include police and fire agencies.
- Need radio communication between City of Bend Police and incident responder.
- Need real time communications with OSP dispatch, ODOT dispatch, and 911 dispatch.
- Need one shared frequency radio in incident response vehicle.

2.4.4 Information Management

User needs relating to information management includes the following:



- Need to automate data collection (volumes, speed, occupancy, vehicle classification, incidents, v/c ratios, pre-emption calls).
- Need to share data in a common format that is GIS compatible.
  - Need a partnership where everyone agrees to the same format and protocol (e.g. Oregon State Plane South Projection).
  - Need to determine data accuracy (Metadata, loop/speed data accuracy).
- Need to provide information available via the Internet.
- Need improved historical data collection and storage to enhance transportation planning. Data must be in an easy to use format.
- Data needs to be consistent across agencies.
- Need collision data with improved location identification (latitude and longitude location) information.
- Automated O&D information would enhance transportation planning. Weighmaster could perform this function for commercial vehicles.
- Need to collect weight of commercial vehicle information.
- Need a history of incident problem areas.
  - Automate the crash location database entry.
  - Record Lat/Long of crashes.
- Need common GIS mapping and format for sharing data.
  - Need the ability to process, analyze, and map data: details for agency use and summaries for public use.
  - Need standardized data (projection) to pull information into GIS and project it correctly.
  - Have a central repository/quality control of GIS.

- Need more system bandwidth to do live video feeds.
- Need to document what data is currently available.

2.4.5 Maintenance & Construction Management

The following user needs were identified for maintenance and construction management:

- Provide in-vehicle geo-coding of maintenance items (potholes, tree-limbs, signs, etc.). Automatically download when vehicle returns to the yard and generate work orders.
  - Can be used for locating utilities, access points, and coding wildlife crashes for migratory studies.
- Need weather/roadway condition information for crews doing the winter maintenance.
  - Hwy 20 needs RWIS, surface temp. @ Horse Ridge.
  - Would like to have weather data @ Sunriver Business Park. Possibly winter maintenance visuals as well.
  - Weather sensors could be placed on public vehicles to provide information over a larger area.
- Need centralized mapping of construction/road closures.
- Need real-time updates on construction activities.
- Need to improve safety in construction work zones.
- Use GPS/AVL in snow plows to track their location information and history of routes that have been plowed.
  - Need to share information between agencies to coordinate plowing.
- OSP needs to know when work zone activity has started.
  - Reduce speeding in work zones.
- Need real-time information (speeds, travel time, etc) in work-zones for better public information.
- Need to have a central list of tube-counter locations for snow plows/street sweeper use.
- Need improved alternative route designation and guidance for sidewalk closures (e.g. audible messages for ADA needs).

2.5 STRENGTHS, WEAKNESSES, CHALLENGES, AND OPPORTUNITIES

During the interviews, the project team identified strengths, weaknesses, opportunities, and challenges that may affect the deployment of ITS projects in Deschutes County. The following sections contain paraphrased summaries of the information gathered.

2.5.1 Strengths

- Established relationships amongst agencies for responding to incidents.
- Agency roles have been defined for emergency response.
- ODOT has an incident responder in Bend.
- Flexible emergency response routes created on demand.
- Red Cross is automatically involved during a fire and will find a shelter.
- Portable variable message signs (PVMS) can be used to supplement fixed message signs during fires.
- County has reverse 911.

- Significant available fiber infrastructure courtesy of franchise agreement with Bend Cable.
- Bend Police has GPS on all 29 police vehicles.
- Mobile data terminals (MDTs) in vehicles for County Sheriff.
- Cable Ch. 48 for traveler information.
- County GIS System/Database.
- City of Bend has Gig Ethernet network connection to all but two of remote City sites.
- City of Bend is testing a wireless network.
- Local ISP has given communications connections to schools (Oregon Trail – 180)
- Bend Dial-a-Ride has largest transit vehicle fleet in County.
    - Will do Medicaid call center for eastern Oregon.
    - Will do scheduling for small providers that tie into their system.

2.5.2 Weaknesses

- Lack of available funding.
- Limited cameras to view traffic condition and incident information.
- Lack of communication to field devices.
- GIS information is maintained in several projections.
- Median on the Parkway is a problem because there is no place to reroute traffic.
- Bridge crossings of the Deschutes River channelize vehicle traffic.

2.5.3 Challenges

- Large expected growth in Bend-Redmond area over next 20 years.
- Rapidly changing demographic with the high growth rate.
- Surges in traffic from tourism.
- Severe weather and related major emergencies.
- Fire is the biggest emergency/evacuation issue – hard to predict where it will occur and what routes will be impacted.
- Managing fire response through roundabouts.
- Bend west side – Century will have to be widened – there is a possible overload in the roundabouts.
    - The roundabouts are designed for two lanes – Consider using Opticom for emergency vehicles?
- 27th Street signals are frequently preempted by emergency response because the hospital is nearby.
- Multiple communication and software systems.
- Need continued ITS education for public, stakeholders, and project managers.
- Have the ITS improvements be flexible.
- No good alternate routes both north and south of Bend for Highway 97.
- Installing conduit is tough because of rock terrain. This always gets cut from projects because it's expensive to do in rock. Directional drilling is difficult.
- Power & Communication is not widely available.
- Mt. Bachelor probably does not want a camera or a dynamic message sign (DMS).
- Keeping traveler information current.
- Finding funding sources.

Opportunities

- Planned projects:
  - The 6 downtown signals will be improved next year.
  - Redmond Highway 97 reroutes (north and south).
  - Redmond ORE 126 couplet – considering Sisters alternate route.
  - Downtown Bend parking garage.
    - 560 stalls planned.
    - Considering SMART Card integrated with transit fares and other TDM measures.
    - Could collect time of day/day of week information.
  - City of Bend Wireless Network.
  - ODOT funded ITS devices.
  - 911 proximity dispatching.
  - 0809 TIP update program to widen 97 to Lava Butte: 4 lanes south to Sunriver.
  - Incorporate ITS into the Regional Transportation Plan (RTP) and System Development Charge (SDC) updates.
  - Sisters parking management.
  - Century Drive/FR 45 intersection improvement – could install video to monitor road conditions.
- Bend MPO views ITS as a component of TSM package.
  - RTP is going to be done – include ITS projects in RTP.
- Bend City Hall may be rebuilt. Engineering will need a facility for traffic operations.
- 50-60 new signals will be needed in Bend within the next 20 years – there are 30 as of right now.
- Transit – measure on November ballot for a transit district.
- Bend Cable, Deschutes County, and the City of Redmond have fiber infrastructure.
  - Look at opportunity to expand franchise agreements with Bend Cable.
  - Consider bringing Bend Cable to the table and negotiating for more access points.
- Have ODOT Department of Administrative Services fiber out of PDX on Hwy 26 into Bend.
- Interchange @ Sunriver South (Century Drive) – planned camera.
- Possible parking management system in Sisters for tourism.
- Possibly a new automated weigh station at Juniper Butte (South Bend).
- ORE 126 in Redmond, US 97 to city limits have 2" conduit, could be widened.
- The new traffic signal in Deschutes Co. (La Pine) will have remote access via cell phone.
- Construction of US 97 Reroute and US 126 Couplet in Redmond are occurring together – communicate construction activity.
- Federal Homeland Security funding could be applied to local needs.
- Deschutes County 911 CAD has capability for AVL/GPS dispatch – working now to implement.
- City of Bend fire is moving to have MDTs in their vehicles – also plan to have GPS/AVL in their vehicles.