

## **DRAFT Public Transportation Operational Concept**

The public transportation operational concept describes the statewide concept for advanced public transportation systems in Oregon.<sup>1</sup> It describes advanced public transportation systems that can be applied to improve the customer experience including systems that deliver real-time transit traveler information, and improve the speed and reliability of transit vehicles. The operational concept is intended to be a high level planning document because the number of stakeholders, and variety of systems applied in Oregon varies significantly. As stakeholders consider the public transportation operational concept, understand that each public transportation provider will likely not deploy all the systems presented in this concept. But, the advanced systems presented here could be used by any public transportation agency as they grow and take advantage of new technologies. Therefore, this operational concept should be a resource for public transportation stakeholders considering new technologies to improve service and the customer experience.

The public transportation operational concept primarily describes the roles and responsibilities of the stakeholders as they relate to advanced public transportation systems such as automatic vehicle location (AVL), transit signal priority (TSP), transit security systems and traveler information. To achieve this end, the operational concept presents the statewide public transportation vision, applications in use today, issues impacting implementation, applications envisioned tomorrow (in the future), and concludes with a description of stakeholder roles and responsibilities relative to the “future” applications. Figure 1 depicts the Oregon public transportation operational concept.

Stakeholders should understand that the systems presented in the Oregon Architecture and Operational Concept categories have some overlap. For example, the public transportation operational concept describes transit traveler information applications, but these systems are also described briefly in the traveler information operational concept. Therefore, when considering traveler information projects, the reader should also refer to the other operational concepts for a complete description of the envisioned services.

### ***Public Transportation Vision***

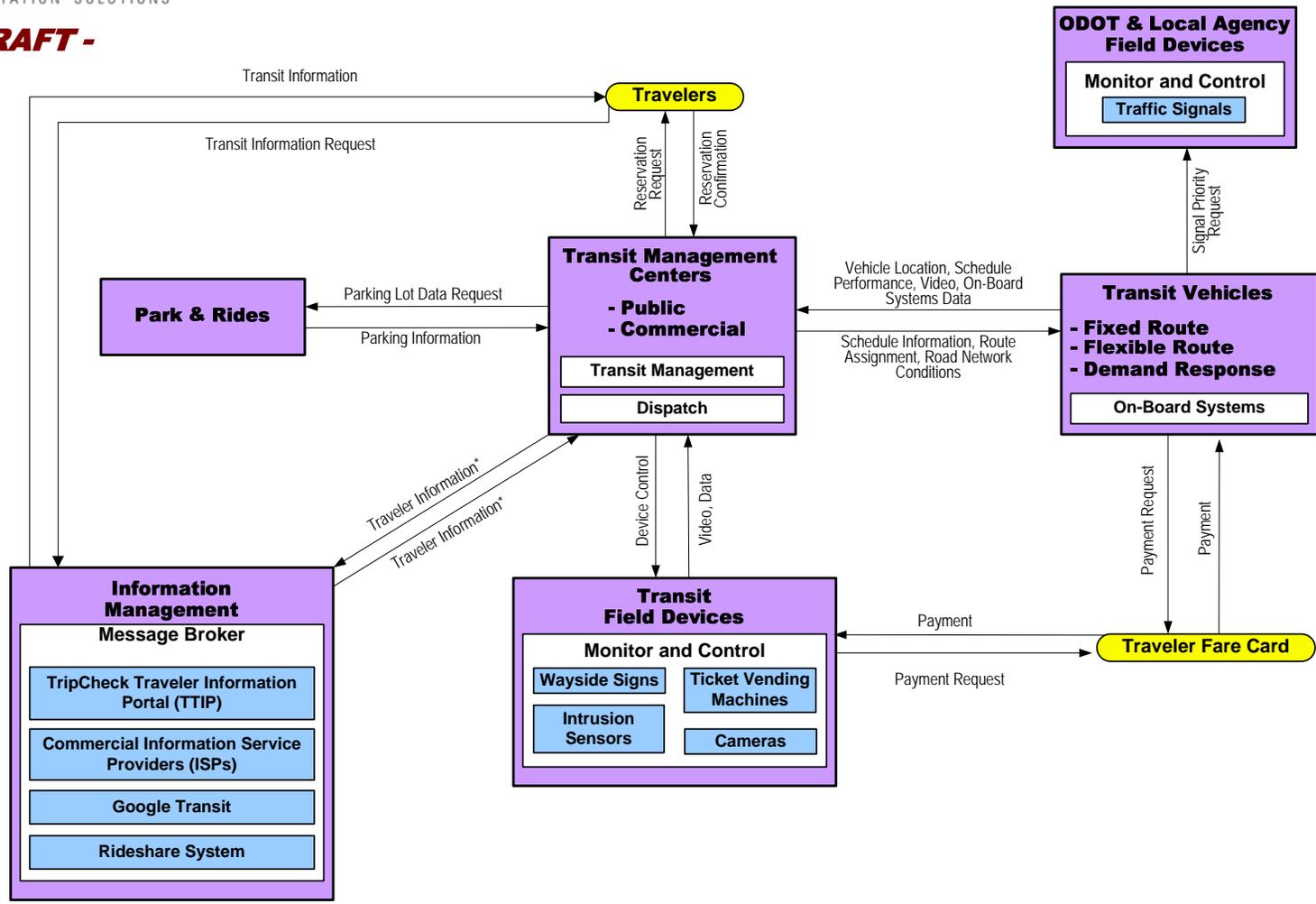
The role of public transportation is to support and enable the attainment of the vision for transportation as outlined in ODOT’s *Oregon Transportation Plan*. That vision is:

“By 2030, Oregon’s transportation system supports people, places and the economy. We travel easily, safely and securely, and so do goods, services and information. Efficient vehicles powered by renewable fuels move all transportation modes. Community design supports walking, bicycling, travel by car and transit wherever appropriate. Our air and water are dramatically cleaner, and community sensitive and sustainable transportation solutions characterize everything we do.”

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<sup>1</sup> See Attachment A for example public transportation ITS projects as defined by the Federal Transit Administration (FTA). The attachment summarizes the following document: *National ITS Architecture Consistency Policy for Transit Projects*, which can be accessed via <http://www.fta.dot.gov/documents/dc2003.pdf>

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\*Traveler information includes, but is not limited to, transit schedule and route information, road network conditions, maintenance and construction activities, road weather information, and emergency and incident information.

See Figure 11 in the Oregon Statewide ITS Architecture for traveler information flows related to public transportation.  
 See Figure 12 in the Oregon Statewide ITS Architecture for maintenance and construction information flows related to public transportation.  
 See Figure 15 in the Oregon Statewide ITS Architecture for incident/emergency management flows related to public transportation.  
 See Figure 17 in the Oregon Statewide ITS Architecture for archived data management flows related to public transportation.

**Figure 1**  
**OREGON PUBLIC TRANSPORTATION**  
**OPERATIONAL CONCEPT FOR YEARS 2010-2020**

## ***Public Transportation Applications Today***

Currently the focus of public transportation applications in Oregon is in the areas of transit management, transit traveler information, transit security, and archived data management. The degree of transit technology in use varies from one community to another.

### *Transit Management*

Transit management includes technology services that improve transit operations by automating systems, deploying monitoring capabilities, and improving communications. Transportation providers around the state use the following transit management applications to varying degrees:

- **Fixed-Route Transit Dispatch Systems:** Some transit agencies use automated systems to dispatch, monitor, and schedule fixed-route services. These systems are often used in conjunction with transit vehicle tracking.
- **Transit Vehicle Tracking:** Some transit agencies equip transit vehicles with devices to track the vehicle location. Tracking vehicles supports dispatch activities and the dissemination of real-time transit traveler information.
- **On-board Vehicle Systems:** Some agencies equip transit vehicles with systems such as automated passenger counters, voice communication systems, and other technologies to support route planning and improving the customer experience.
- **Transit Signal Priority:** Some transit agencies use transit signal priority along corridors with fixed-route transit services. Fixed-route transit vehicles are equipped with a device that communicates with traffic signals and extends the green time of a signal phase to reduce transit travel times and improve reliability.
- **Fleet Maintenance Systems:** Some transit agencies use automated vehicle data to track when regularly scheduled maintenance is due for vehicles.

### *Transit Traveler Information*

Traveler information allows transit users to make pre-trip and en-route plans using phone, web-based, or kiosk systems. Transit agencies around the state use the following traveler information technology services:

- **Pre-Trip Traveler Information:** Numerous transit agencies provide a web or phone based system that provides travelers with route and fare information.
- **En-Route Traveler Information:** Several transit agencies provide a web or phone based system that allows travelers to access real-time schedule information while en-route. En-route transit information is also provided remotely on electronic signs at transit stops or at information kiosks. Real-time information often includes, but is not limited to, next arrival times, trip planning, and detour information.
- **Automated Stop Announcements:** Transit agencies use automated announcements on fixed-route transit vehicles to inform passengers of the next stop. These announcements are typically verbal but some transit vehicles also include visual announcements on electronic signs.

More information about connections between traveler information systems and public transportation is included in the Traveler Information Operational Concept of this Oregon Statewide ITS Architecture and Operational Concept Plan document.

### Transit Security

Transit security applications allow transit agencies to monitor transit areas and improve the safety of transit users. Transit agencies around the state use the following transit security technology services:

- **Closed-Circuit Television (CCTV) Cameras:** Several transit agencies use CCTV cameras to monitor security on-board vehicles, at transit stops or centers, at park and ride facilities, or at agency facilities (e.g. transit garage or lot).
- **Intrusion Sensors:** Intrusion sensors are used on a limited basis to monitor key transit infrastructure (e.g. tunnel used for light rail).
- **Emergency Telephones:** Some transit agencies provide telephones at transit stops, centers, or park and rides that travelers may use for emergency assistance.

### Archived Data Management

Several transit agencies use automated methods to transfer data from transit vehicles or systems to a database for archiving. The archived data is used for performance measurement, transit planning, and federal transit reports. For example, TriMet uses an automated method to transfer their transit data to the Portland regional transportation data warehouse (PORTAL). More information about connections between data management systems and public transportation is included in the Archived Data Management Operational Concept of this Oregon Statewide ITS Architecture and Operational Concept Plan document.

### **Public Transportation Issues**

The prominent public transportation issues affecting implementation in Oregon today include the following:

- Few public transportation service providers are currently able to provide comprehensive real-time transit traveler information, which is in high demand from the traveling public.
- Lack of a statewide transit plan limits our ability to move to common system standards.
- Smaller public transportation service providers must dedicate most or all of their resources to providing services instead of advancing transit technology.
- Federal reporting does not take full advantage of automated transit systems.
- The lack of common system standards presents difficulties sharing data between public transportation service providers as well as providing statewide transit traveler information.
- Coordination between public transportation service providers and emergency management agencies is done through phone calls and does not use automated data exchange between systems.

### **Public Transportation Applications Tomorrow**

Public transportation applications of tomorrow will automate many transit management activities, provide comprehensive statewide transit traveler information, enhance transit security, archive transit data, and support emergency management.

### Transit Management

Tomorrow's applications will continue to automate as many transit management processes as possible to streamline operations:

- **Fixed-Route Transit Dispatch Systems:** Transit agencies will use an automated system to dispatch, monitor, and schedule fixed-route services. This will be used most effectively in conjunction with transit vehicle tracking.
- **Demand Response Reservation and Dispatch Systems:** Transit agencies will use a system to take reservations and to dispatch, monitor, and schedule demand response transit services.
- **Integrated Fixed-Route and Demand Response Reservation and Dispatch Systems:** Integration of these systems supports automated coordination at transfer points, optimizes service options, and maximizes the efficiency of reservations and route assignments for special transit user needs.
- **Transit Vehicle Tracking:** Transit vehicles will be equipped with vehicle tracking devices to improve transit system management and transit traveler information.
- **On-board Systems:** More transit vehicles will be equipped with automated passenger counters, voice communication systems, or other technologies to support operations.
- **Transit Signal Priority:** Transit signal priority will be used on corridors with fixed-route transportation services to improve on-time transit performance and reliability.
- **Road Network Conditions:** Transit dispatchers will have access to a variety of road network conditions from traffic management agencies and will adjust transit service as needed. Road condition information includes real-time and predictive travel speeds on key regional corridors, traffic incident impacts, and planned maintenance and construction activities.
- **Fleet Maintenance Systems:** Transit fleets will use automated monitoring services that indicate when routine maintenance is due for activities such as engine maintenance (e.g. oil changes, battery replacement), lift service, or other on-board system maintenance.
- **Regional Fare Cards:** Fare cards will be used to allow travelers to pay for transit services throughout a region using a single card.

#### Transit Traveler Information

Tomorrow's applications will include comprehensive static and real-time transit traveler information that is seamless throughout Oregon:

- **Statewide Multimodal Trip Planning Tool:** Travelers will plan multimodal trips (transit, car, bicycle, walking) throughout the state of Oregon from a single web site or smart phone application. To support statewide trip planning transportation service providers will use standardized data (general transit feed specification, GTFS) and share it with TripCheck and commercial information service providers.
- **En-Route Traveler Information:** En-route and real-time transit information (such as next arrivals, connections, delays, detours, and parking availability at transit parking lots) will be readily available to transit users.
- **Personalized Traveler Information:** Technology applications that provide information specific to individual users based on unique requests, past transit patterns and traveler preferences will be used to provide personalized information.
- **Rideshare System:** A single web site and telephone rideshare system will be used statewide to match interested travelers. This system will integrate rideshare programs currently used in different areas of Oregon. ODOT currently plans to implement a system called RideShare Online (managed by King County, Washington) in 2011.

Transit Security

Transit security systems (CCTV cameras, intrusion sensors, and emergency telephones) will continue to be installed on transit vehicles and at transit stops, centers, park and rides, and other transit facilities.

Archived Data Management

Data will automatically be archived in agency data marts and regional or statewide data warehouses. This data will be used for system network monitoring, performance measure evaluation, asset management, financial decision making, and federal transit reporting. More information is included in the Archived Data Management Operational Concept of this Oregon Statewide ITS Architecture and Operational Concept Plan document.

Emergency Management

Transportation service providers will coordinate with emergency management agencies to support emergency evacuation and reentry using transit vehicles. Emergency management systems will be integrated with transit dispatch systems so emergency management agencies are able to track transit vehicle locations in real time. More information is included in the Emergency Management Operational Concept of this Oregon Statewide ITS Architecture and Operational Concept Plan document.

**Stakeholder Roles and Responsibilities**

Table 1 lists stakeholder roles and responsibilities that involve public transportation in other operational concepts of the architecture. All non-bolded text in Table 1 indicates roles and responsibilities already included in the architecture while any bold italicized text indicates a new proposed role or responsibility and text with a strikethrough indicates deletions. Table 2 is a new table that includes the stakeholder roles and responsibilities for public transportation.

**Table 1. Public Transportation Roles and Responsibilities for Other Service Areas (from August 2006 Oregon Statewide ITS Architecture and Operational Concept Plan with proposed additions shown in bold italics and deletions shown with strikethroughs)**

Stakeholder	Roles and Responsibilities	Status
<b>Regional Traffic Control</b>		
Public Transportation Service Providers	<ul style="list-style-type: none"> <li><del>▪ Provide transit vehicle probe data.</del></li> <li>▪ <b><i>Provide transit operation status, incident, parking, and transfer operational information to TTIP, where ODOT and local traffic management agencies may access the information.</i></b></li> </ul>	<ul style="list-style-type: none"> <li><del>▪ Existing/Planned</del></li> <li>▪ <b><i>Planned</i></b></li> </ul>
<b>Traveler Information*</b>		
Public Transportation Service Providers	<ul style="list-style-type: none"> <li>▪ Design/construct/maintain/operate ITS equipment to support transit traveler information (e.g. transit arrival signs, on-board systems).</li> <li>▪ Provide transit traveler information (e.g. routes, <b><i>schedules, special accommodations</i></b> fares) to the TripCheck system for <b><i>Transportation Options</i></b> the Regional Trip Planner.</li> <li>▪ <b><i>Create/maintain open GTFS data.</i></b></li> <li>▪ Provide transit vehicle location information to TTIP.</li> <li>▪ Disseminate transit traveler information through public transportation agency systems (e.g. transit Web sites and phone systems) <b><i>and commercial information service providers.</i></b></li> <li>▪ <b><i>Develop and maintain a statewide ridesharing system (Web site and phone system).</i></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> <li>▪ <del>Programmed</del> <b><i>Existing</i></b></li> <li>▪ <b><i>Existing/Planned</i></b></li> <li><del>▪ Future</del> <b><i>Planned</i></b></li> <li>▪ Existing/Planned</li> <li>▪ <b><i>Planned</i></b></li> </ul>
Commercial Transportation Service Providers	<ul style="list-style-type: none"> <li>▪ Provide transit traveler information (e.g. routes, <b><i>schedules, special accommodations</i></b> fares) to the TripCheck system for <b><i>Transportation Options</i></b> the Regional Trip Planner.</li> <li>▪ Provide transit vehicle location information to TTIP.</li> <li>▪ Disseminate traveler information through commercial transportation company systems (e.g. Web sites) <b><i>and commercial information service providers.</i></b></li> <li>▪ <b><i>Create/maintain open GTFS data.</i></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <del>Programmed</del> <b><i>Existing</i></b></li> <li>▪ <del>Future</del> <b><i>Planned</i></b></li> <li>▪ Existing/Planned</li> <li>▪ <b><i>Existing/Planned</i></b></li> </ul>
Commercial Information Service Providers	<ul style="list-style-type: none"> <li>▪ Subscribe to TTIP to obtain current real-time traveler information*. <b><i>Use transit agency GTFS data to provide transit information to wider audience.</i></b></li> <li>▪ Disseminate traveler information* through commercial systems (e.g. Web sites).</li> </ul>	<ul style="list-style-type: none"> <li>▪ <del>Programmed</del> <b><i>Existing/Planned</i></b></li> <li>▪ Existing/Planned</li> </ul>
Media	<ul style="list-style-type: none"> <li>▪ Subscribe to TTIP to obtain current real-time traveler information*.</li> <li>▪ Disseminate traveler information* through the media (e.g. television and radio broadcasts).</li> </ul>	<ul style="list-style-type: none"> <li>▪ <del>Programmed</del> <b><i>Existing/Planned</i></b></li> <li>▪ Existing/Planned</li> </ul>
<b><i>Event Promoters</i></b>	<ul style="list-style-type: none"> <li>▪ <b><i>Provide special event information to transportation service providers, ODOT, and local traffic management agencies.</i></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b><i>Existing/Planned</i></b></li> </ul>

Stakeholder	Roles and Responsibilities	Status
<b>Maintenance and Construction</b>		
Oregon Department of Transportation	<ul style="list-style-type: none"> <li>▪ Coordinate maintenance and construction activities with local traffic management agencies, external state DOTs, <b>public and commercial transportation service providers</b>, and private utility companies using HTCRS/TTIP.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Programmed Existing</b></li> </ul>
Local Traffic Management Agencies	<ul style="list-style-type: none"> <li>▪ <b>Coordinate</b> Exchange maintenance and construction activities information with other public agencies <b>(including transit agencies) using direct communication</b> and private utility companies using TTIP.</li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Planned</b></li> </ul>
<b>Public Transportation Service Providers</b>	<ul style="list-style-type: none"> <li>▪ <b>Coordinate maintenance and construction activities with other public agencies and private utility companies using TTIP.</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Planned</b></li> </ul>
<b>Emergency Management</b>		
<b>Public Transportation Service Providers</b>	<ul style="list-style-type: none"> <li>▪ <b>Provide transportation services for evacuations and reentry during emergencies.</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Existing/Planned</b></li> </ul>
<b>Commercial Transportation Service Providers</b>	<ul style="list-style-type: none"> <li>▪ <b>Provide transportation services for evacuations and reentry during emergencies.</b></li> </ul>	<ul style="list-style-type: none"> <li>▪ <b>Existing/Planned</b></li> </ul>
<b>Archived Data Management</b>		
Public Transportation Service Providers	<ul style="list-style-type: none"> <li>▪ Design/construct/maintain/operate field equipment and in-vehicle systems that support automated data collection.</li> <li>▪ Maintain agency-owned data mart(s).</li> <li>▪ Design/maintain infrastructure that supports data transfer to agency-owned data mart(s) and the PORTAL data warehouse.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> </ul>
<p>* Traveler information includes, but is not limited to, information about road/traffic conditions, weather, transit, heavy rail, parking, incidents, major emergencies, maintenance and construction activities, special events, and traveler services.</p>		

Table 2. Public Transportation Roles and Responsibilities

Stakeholder	Roles and Responsibilities	Status
Public Transportation Service Providers	<ul style="list-style-type: none"> <li>▪ Design/construct/integrate/maintain/operate transit systems and transit field devices.</li> <li>▪ Dispatch fixed-route vehicles.</li> <li>▪ Manage reservations and dispatch demand response and flexible route vehicles.</li> <li>▪ Coordinate service with other public transportation service providers at system transfer points.</li> <li>▪ Lead the installation of transit signal priority with ODOT and local traffic management agencies. Provide transit signal priority equipment on transit vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> </ul>
Commercial Transportation Service Providers	<ul style="list-style-type: none"> <li>▪ Manage reservations and dispatch vehicles.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> </ul>
Oregon Department of Transportation	<ul style="list-style-type: none"> <li>▪ Encourage and support using the ITS Architecture for project planning and implementation.</li> <li>▪ Act as a liaison for the rest of ODOT.</li> <li>▪ Fund advanced public transportation system improvements.</li> <li>▪ Provide coordination and oversight in the procurement and implementation of new ITS projects.</li> <li>▪ Design/construct/maintain/operate transit signal priority equipment associated with traffic signals.</li> <li>▪ Operate traffic signals with transit signal priority and monitor performance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> </ul>
Local Traffic Management Agencies	<ul style="list-style-type: none"> <li>▪ Design/construct/maintain/operate transit signal priority equipment associated with traffic signals.</li> <li>▪ Operate traffic signals with transit signal priority and monitor performance.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> <li>▪ Existing/Planned</li> </ul>
Travelers	<ul style="list-style-type: none"> <li>▪ Provide feedback on transit system, passenger amenities, and transit information to transit management.</li> <li>▪ Pay for public transportation services using a traveler fare card.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> <li>▪ Planned</li> </ul>
Event Promoters	<ul style="list-style-type: none"> <li>▪ Coordinate with transportation service providers in advance of special events for transportation services.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Existing/Planned</li> </ul>

# Attachment A

## What Is And Is Not an ITS Project?

### What is an ITS Project?

ITS, as defined by TEA-21, is a broad array of advanced technologies and systems. An **ITS Project** is “Any project that in whole or in part funds the acquisition of technologies or systems of technologies that provide or significantly contribute to the provision of one or more ITS User Services as defined in the National ITS Architecture.” *Thus, if the project includes ITS components that implement any of the defined User Services it is considered an “ITS Project.”*

Examples of transit systems that may be implemented as part of transit ITS Projects are:

- **Pre-trip traveler information systems** through phone, 511 systems, kiosks, the web and other electronic channels that help provide route and fare information or itinerary planning;
- **En-route transit information** through 511 systems, variable message signs, enunciators, or personal devices that provide next vehicle and stop information, or route and itinerary planning;
- **Multi-modal traveler information systems** that integrate transit information with highway, rail, and other options; and
- **Personalized public transit** for route deviation, flex route, and para-transit services;
- **Transit management systems and management centers** using AVL, computer aided dispatch, GIS, and surveillance of network conditions to improve the travel time and reliability of the transit system, and provide for transfer connection protection;
- **Transit Signal Priority** to improve the travel time and reliability of the transit vehicles operating in mixed flow, or crossing major arterials at grade.
- **Carpool Ride Matching & Reservation systems;**
- **Electronic payment systems** both at transit centers and stations and on vehicles that include both fare payment and the ability to pay for other services (parking or toll charges);
- **Communications systems** that provide the backbone for the vehicle and wayside communication to each other and to the transportation management center;
- **Automatic Passenger Counters** for performance monitoring and service planning;
- **Vehicle and system monitoring** that tracks system functions and provides warning of likely malfunction or maintenance needs;
- **Vehicle, stop, or wayside surveillance** to provide for passenger, driver and system safety and security. Silent alarms to notify authorities of an incident or emergency;
- **Highway/Rail Intersection Protection** to improve the safety of rail-transit operations and buses that travel through rail intersections;
- **Collision warning/avoidance, vision enhancement, and driver assistance** to ensure safe transit operations in increasingly congested conditions, or limited right of ways; and
- **Data archiving and information management systems** to store and analyze the real time system data and assist in service planning, system monitoring, and other decisions.

### What is not an ITS project?

There are a variety of other technologies that are used that are not considered ITS. Projects including only these technologies and no ITS technologies as previously described are not subject to the FTA ITS Architecture policy. Examples of these technologies include:

- New computers for transit agency management staff
- Data management software to assist in preparing third-party bills
- Software to monitor drug and alcohol testing program

A list of the National ITS Program ITS User Services is attached. Additional information on the FTA policy is available at the ITS Architecture implementation website: [http://www.ops.fhwa.dot.gov/its\\_arch\\_imp/index.htm](http://www.ops.fhwa.dot.gov/its_arch_imp/index.htm). Still have questions? Contact your FTA Regional Office, where staff will be available to assist you.

<b>National ITS Program ITS User Services</b>		
<b>User Service</b>	<b>Bundles and Definitions</b>	<b>Description</b>
<b>1.</b>	<b>TRAVEL AND TRAFFIC MANAGEMENT</b>	
1.1	<b>Pre-Trip Travel Information</b>	<b>Provides information for selecting the best transportation mode, departure time, and route.</b>
1.2	En-Route Driver Information	Driver advisories and in-vehicle signing for convenience and safety during travel.
1.3	<b>Route Guidance</b>	<b>Provides travelers with simple instructions on how to best reach their destinations.</b>
1.4	<b>Ride Matching and Reservation</b>	<b>Makes ride sharing easier and more convenient.</b>
1.5	Traveler Services Information	Provides a business directory, or "yellow pages," of service information.
1.6	<b>Traffic Control</b>	<b>Manages the movement of traffic on streets and highways.</b>
1.7	<b>Incident Management</b>	<b>Helps public and private organizations quickly identify incidents and implement a response to minimize their effects on traffic.</b>
1.8	<b>Travel Demand Management</b>	<b>Supports policies and regulations designed to mitigate the environmental and social impacts of traffic congestion.</b>
1.9	Emissions Testing and Mitigation	Provides information for monitoring air quality and developing air quality improvement strategies.
1.10	<b>Highway-Rail Intersection (HRI)</b>	<b>Integrates ITS technology into already existing HRI warning systems to enhance their safety effectiveness and operational efficiency. At railroad grade crossings, HRI technologies located both in-vehicle and along the roadside ensure that train movements are coordinated with traffic signals and that drivers are alerted to approaching trains.</b>
<b>2.</b>	<b>PUBLIC TRANSPORTATION MANAGEMENT</b>	
2.1	<b>Public Transportation Management</b>	<b>Automates operations, planning, and management functions of public transit systems.</b>
2.2	<b>En-Route Transit Information</b>	<b>Provides information to travelers using public transportation after they begin their trips.</b>
2.3	<b>Personalized Public Transit</b>	<b>Flexibly routed transit vehicles offer more convenient service to customers.</b>
2.4	<b>Public Travel Security</b>	<b>Creates a secure environment for public transportation patrons and operators.</b>
<b>3.</b>	<b>ELECTRONIC PAYMENT</b>	
3.1	<b>Electronic Payment Services</b>	<b>Allows travelers to pay for transportation services electronically.</b>
<b>4.</b>	<b>COMMERCIAL VEHICLE OPERATIONS</b>	
4.1	Commercial Vehicle Electronic Clearance	Facilitates domestic and international border clearance, minimizing stops.
4.2	Automated Roadside Safety Inspection	Facilitates roadside inspections for CVO vehicles.
4.3	On-Board Safety Monitoring	Senses the safety status of a commercial vehicle, cargo, and driver.
4.4	Commercial Vehicle Administrative Processes	Provides electronic purchasing of credentials and automated mileage and fuel reporting and auditing.
4.5	Hazardous Material Incident Response	Provides immediate description of hazardous materials to emergency responders.
4.6	Commercial Fleet Management	Provides real time communications for vehicle location, dispatching, and tracking between drivers, dispatchers, and inter-modal transportation providers.

<b>National ITS Program ITS User Services</b>		
<b>User Service Bundles and Definitions</b>	<b>Description</b>	
<b>5.</b>	<b>EMERGENCY MANAGEMENT</b>	
<b>5.1</b>	<b>Emergency Notification and Personal Security</b>	<b>Provides immediate notification of an incident and an immediate request for assistance.</b>
5.2	Emergency Vehicle Management	Reduces the time it takes emergency vehicles to respond to an incident.
<b>6.</b>	<b>ADVANCED VEHICLE SAFETY SYSTEMS</b>	
<b>6.1</b>	<b>Longitudinal Collision Avoidance</b>	<b>Helps prevent head-on, rear-end or backing collisions between vehicles, or between vehicles and other objects or pedestrians.</b>
<b>6.2</b>	<b>Lateral Collision Avoidance</b>	<b>Helps prevent collisions when vehicles leave their lane of travel.</b>
6.4	Vision Enhancement for Crash Avoidance	Improves the driver's ability to see the roadway and objects that are on or along the roadway.
<b>6.5</b>	<b>Safety Readiness</b>	<b>Provides warnings about the condition of the driver, the vehicle, and the roadway.</b>
6.6	Pre-Crash Restraint Deployment	Anticipates an imminent collision and activates passenger safety systems before the collision occurs, or much earlier in the crash event than is currently feasible.
<b>6.7</b>	<b>Automated Highway Systems</b>	<b>Provides a fully automated, "hands-off," operating environment.</b>
<b>7.</b>	<b>INFORMATION MANAGEMENT</b>	
<b>7.1</b>	<b>Archived Data User Service (ADUS)</b>	<b>This user service will provide an ITS Historical Data Archive for all relevant ITS data and will incorporate the planning, safety, operations, and research communities into ITS. It will provide the data collection, manipulation, and dissemination functions of these groups, as they relate to data generated by ITS. The ITS Historical Data Archive will function as a data warehouse or repository to support stakeholder functions.</b>