Regional ITS Architecture

PennDOT District 2-0
ITS Architecture Region

Updated Version 1.1
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Submitted by:

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Regional Champion

The Regional Champion supported the RAP by facilitating the RAP meetings and played a critical role in coordinating with the Statewide Working Group for merging statewide visions with Regional characteristics. The Champion for this Region was:

Denny Prestash – PennDOT District 2-0

Regional Advisory Panel

The Regional Advisory Panel lead and guided the Regional ITS Architecture development in the Southwest ITS Architecture Region. The Architecture was developed with input from regional stakeholders, channeled and focused by the RAP.

Mike Baglio – PennDOT District 2-0
Mike Bloom – Centre County Metropolitan Planning Commission
Steve Herman – SEDA Council of Governments
Jim Hunt – Federal Highway Administration
Ron Keim – PennDOT District 2-0
Amy Kessler – North Central PA Regional Planning and Development Commission
Robert Kingsley – Federal Highway Administration
Hugh Mose – CATA

Brenda Murphy – BHSTE
Dennis Prestash – PennDOT District 2-0
Kim Reese – Clearfield County Maintenance Department
Jim Roman – PennDOT District 2-0
Jeff Walker – PennDOT District 2-0
Matt Weaver – BHSTE
Tom Zilla – Centre County Metropolitan Planning Commission

Orth-Rodgers & Associates, Inc & Jacobs Edwards and Kelcey

The principal role of Orth-Rodgers & Associates, Inc was to oversee and produce the Regional ITS Architectures. Jacobs Edwards and Kelcey re-formatted the architecture and updated the turbo Architecture files. District 2-0 projects were updated to reflect the needs addressed by stakeholders through the Regional Operations Plan (ROP).
Conformity Statement

The District 2-0 Region of the Commonwealth of Pennsylvania is in compliance with the requirements of the “Intelligent Transportation Systems Architecture and Standards,” as mandated by the Federal Highway Administration (23 CFR 940) and supported by the policy of the Federal Transit Administration.

The following policy objectives are enumerated in 23 CFR 940.5: “ITS projects shall conform to the National ITS Architecture and standards in accordance with the requirements contained in this [Federal rule]. Conformance with the National ITS Architecture is interpreted to mean the use of the National ITS Architecture to develop a [R]egional ITS Architecture, and the subsequent adherence of all ITS projects to that [R]egional ITS Architecture. Development of the [R]egional ITS Architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning.”

The District 2-0 Region’s ITS Architecture was developed to address these specific policy objectives. The resultant Regional ITS Architecture is consistent with Pennsylvania’s statewide and metropolitan transportation planning processes.
1 Introduction

This document, developed under the Pennsylvania Intelligent Transportation Systems (ITS) Architecture initiative, presents the ITS Architecture for Pennsylvania’s District 2-0 Region, which is comprised of nine counties in Region 2 of the state. The District 2-0 Region encompasses PennDOT Engineering District 2-0. This document is the result of intensive data-gathering, research, and planning activities conducted in 2001. The current version of the ITS Architecture was updated in July 2007.

The District 2-0 Regional ITS Architecture was prepared under the auspices of a Regional Advisory Panel (RAP), a panel of experts drawn from transportation stakeholder organizations across the Region and State. Additional stakeholder organizations participated in the process of “validating” the Architecture. Jacobs Edwards and Kelcey executed an update of the Architecture under contract to the Pennsylvania Department of Transportation (PennDOT). PennDOT appointed an ITS Statewide Working Group to establish statewide ITS Architecture standards, advise and guide the statewide process, and ensure consistency across the Regions.

The District 2-0 Regional ITS Architecture is one of nine Regional Architectures being developed across the Commonwealth of Pennsylvania, as shown in Figure 1-1, below:

![Figure 1-1: PennDOT ITS Architecture Regions](image)
1.1 Architecture Process

PennDOT took a structured approach to developing Regional ITS Architectures throughout the State. The Regional ITS Architecture development process was defined and documented in the “Pennsylvania ITS Architecture Phase I Report,” dated February 2003. PennDOT, the Federal Highway Administration (FHWA), the Pennsylvania State Police (PSP), and the Planning Partners championed the former effort.

The Phase I Report describes PennDOT’s approach towards developing Regional ITS Architectures in Pennsylvania while utilizing the national guidance. The approach ensures that the resultant Architectures depict the ITS infrastructure in the Region and conform to the National ITS Architecture. The process developed is inherently flexible and adaptable so that special conditions and circumstances in each Region can be effectively addressed or otherwise accommodated, while maintaining a statewide consistency.

The development process was specifically designed to support the preparation and refinement of Regional ITS Architectures across Pennsylvania. The process benefits the Pennsylvania environment, optimizes the national guidance, and creates an efficient and effective response to regional needs and circumstances.

The complete process for developing Regional ITS Architectures in Pennsylvania, as described in the Phase I Report, is:

- Task 1.0 — Define Architecture Scope
- Task 2.0 — Inventory Systems and Define Needs, Services, and Operations Concept
- Task 3.0 — Generate Strawman Regional ITS Architecture
- Task 4.0 — Conduct Outreach to Validate Regional ITS Architecture
- Task 5.0 — Finalize the Regional ITS Architecture
The process is depicted in further detail in the following schematic:

![Pennsylvania ITS Architecture Process Schematic](image)

**Figure 1-2: Pennsylvania ITS Architecture Process Schematic**

### 1.2 Using this Document

This document is, principally, a resource instrument, designed to assist engineers, planners, designers, developers, managers, and decision-makers in defining a regionally-integrated surface transportation infrastructure that promotes safety, maximizes operational efficiencies, and utilizes appropriate technologies. Materials in the document are targeted at traditional surface transportation organizations, transit agencies, and the host of entities that interface with the transportation infrastructure. The latter include incident and emergency management personnel, commercial vehicle operators, shippers, operators of tourist destinations, event managers, traveler information providers, etc.

The document is a resource instrument to be consulted during the planning process. It is not intended as a textbook to be read from cover-to-cover.

The term “ITS” implies the use of technologies or other innovations to achieve new operational efficiencies in transportation. Yet, an ITS Architecture is, itself, technology-independent; that is, it identifies *who and what* need to connect, but not *how* those connections ought to best to be accomplished.

An ITS Architecture describes the interrelationships that exist—or ought to exist—among transportation “elements” across the Region. It distinguishes between those relationships that exist now and those planned for the future. However, the Architecture
does not judge the efficacy, or utility, of those relationships or assess whether the technologies or procedures supporting those linkages are optimized. These sorts of judgments will need to be made after the Regional ITS Architecture is finalized.

**Document Organization and Access Strategies**

The ITS Architecture is presented in five primary sections:

- **Section 1 — Introduction**
- **Section 2 — Architecture Scope**
- **Section 3 — Regional Systems Inventory, Needs, and Services**
- **Section 4 — Regional Architecture**
- **Appendices**

Section 1, *Introduction*, contains important background information and establishes the “context” for the Architecture effort. This section defines key concepts and terms, examines the utility of a Regional ITS Architecture, the importance of maintaining the Architecture, ITS standards, and strategies for mainstreaming, or institutionalizing, ITS. This section should be read in its entirety.

Section 2, *Architecture Scope*, summarizes the general scope and magnitude of the Regional ITS Architecture effort. It describes the District 2-0 Region, emphasizing those characteristics that potentially impact transportation activities and performance. It further identifies major ITS stakeholders and existing and planned ITS projects across the Region. This section of the document should also be read in its totality.

Section 3, *Regional Systems Inventory, Needs, and Services*, contains the essential “building blocks” of the ITS Architecture. It identifies and defines each pertinent ITS “element” in the Region. “Elements” are the organizational entities (e.g., the PennDOT District Offices, 911 Communications Centers, and Regional Transit Agency Offices) that operate in the transportation environment. Additionally, the section presents the ITS Systems Inventory, organized by element and linked back to the Projects List in Section 2. The Needs and Services tables establish the interrelationships among the Region’s ITS elements. Each element in the Needs Table is defined in terms of the “inputs” it requires from the other elements with which it interacts; similarly, each element in the Services Table is defined in terms of the “outputs” it furnishes to other elements.

Users of the ITS Architecture should familiarize themselves with the general content of Section 3. Thereafter, when they are engaged in ITS deployment planning or related activities, they can generally proceed directly to Section 4. Users can return to Section 3, as needed, for descriptions of the elements being investigated, identification of the pertinent roadway corridors, and more comprehensive understanding of the interrelationships across elements.
Section 4, *Regional Architecture*, graphically displays the details of the ITS Architecture. Notably, Figure 4-2, *Regional Subsystem Interconnect Diagram Showing Elements*, identifies the systems and subsystems with which each regional ITS element is associated; elements are color-coded—here and throughout the remainder of the document—according to which of the four primary systems they fall under (i.e., Centers, Roadside, Vehicles, or Travelers). Similarly, Table 4-2, *Regional Interconnect Matrix*, specifies which elements gather inputs from—or furnish outputs to—other elements. The remainder of Section 4 is a compendium of the ITS elements. Each element is depicted in terms of the other elements with which it interfaces, and then each “element pair” is examined in detail. The detailed pairings show the types of information that pass between the elements, the direction of the information flow, and whether the flow currently exists or is planned.

Practitioners consulting the Regional ITS Architecture can use Table 4-2 to determine those elements pertinent to their investigations and proceed directly to the corresponding interconnect diagrams. From the diagrams, practitioners can gather the essential information.

The *Appendices* contain a wealth of supplemental materials to assist practitioners in comprehending the Architecture. These include: (1) ITS acronyms; (2) definitions of ITS terminology; (3) definitions of subsystems/terminators and architecture flows identified and defined in the National ITS Architecture; (4) “operations coverage” across the Region; and (5) summaries of Outreach and Validation meetings.

**Sample Access Scenario**

The Regional ITS Architecture is a valuable planning tool. The following sample scenario defines how a stakeholder in the Region might utilize the material presented in this document:

A transit agency planner in Pennsylvania’s District 2-0 Region preparing to deploy an automatic vehicle location (AVL) system on its buses can learn a great deal from consulting the Regional ITS Architecture. By turning to the Regional Transit Agency Offices’ Interconnect Diagram, the transit planner can immediately grasp the range of stakeholders potentially interested in receiving pertinent vehicle location and more detailed transit data (e.g., 911 Communication Centers, PennDOT Traffic Management Centers, Personal Traveler Information Devices, etc.). The planner would discover that connections between 911 Communication Centers are generally in place; that the remaining interfaces do not currently exist, but are planned for the future.

By consulting the interconnect and information flow diagrams, the transit planner would further learn that AVL inputs might effectively be used to improve the detail, precision, and timeliness of transit emergency data that already pass to other agencies in the Region. The diagrams further show that future “hooks” are planned for communicating bus status data to other agencies. For example, PennDOT would like to use the transit vehicles as probe data to identify congested corridors in the Region. Other stakeholders might be interested in broadcasting vehicle status or delay data to their users.
Access to the ITS Architecture enables users to view the pertinent infrastructure before new ITS projects are undertaken. Existing and planned interrelationships can be quickly viewed and grasped, and the realm of agencies and other entities with a potential stake in the subject matter can be easily identified. Details about the information passing between stakeholders offer insight into optimizing future deployments and concretizing the range of possibilities for important new projects.

**Accessing the Architecture On-Line**

Key sections of the Regional ITS Architecture—notably Section 4 of the hardcopy document—are accessible on-line. To access the District 2-0 Regional Architecture, go to:

http://www.paits.org

**1.3 Utility of the Architecture**

Developing, maintaining, and utilizing the ITS Architecture offers a range of significant benefits to the adopting Region. These benefits include the following:

- **A Regional ITS Architecture enables planning and deployment to occur in an organized and coordinated manner.** It offers a framework for systematically identifying and evaluating prospective solutions to the transportation problems in the Region. It establishes an environment for inter-agency cooperation and coordination. Stakeholders across the Region may use the Architecture to plan their ITS projects to support regional goals and priorities. Utilization of the Architecture also helps to ensure consistency among the state, regional, and local planning processes.

- **A Regional ITS Architecture establishes institutional mechanisms that promote the development and deployment of ITS projects.** The Architecture compels the Region to set up forums for the discussion of regional transportation requirements. These forums, in turn, encourage the building of relationships among transportation professionals and stakeholders across the Region—these professionals are thereby given opportunities to understand the needs, issues, constraints, etc. of other transportation sectors. As the regional dialogue expands, institutional barriers tend to crumble and the integration of disparate goals, concepts, approaches, and solutions is increasingly possible. With this institutional integration comes the sharing of technologies and information, so that innovative, region-wide thinking becomes a guiding principle in transportation planning and new, synergistic relationships take hold. Additionally, the Architecture provides the basis for updating the Transportation Plan, the Transportation Improvement Program (TIP), the Statewide TIP, and the State Implementation Plan (SIP).

- **A Regional ITS Architecture promotes interoperability.** The Architecture reveals to stakeholders the key interrelationships presently established in the Region and those planned for the future. These interrelationship requirements identify those areas where operational or technology bridges to multiple agencies are needed.
In this way, the Architecture helps to anticipate and plan for the integration requirements between state, regional, and local systems. Significantly, the Architecture promotes adherence to consistent and uniform standards across the Region. By its very nature, it also ensures consistency in documentation of ITS elements across the Region.

- **A Regional ITS Architecture encourages efficient investment.** As prospective new ITS projects are identified in the Region, they can be “plotted” on the Regional Architecture and their interrelationships with existing and planned components assessed. This lessens the probability that a particular project will result in a “dead-end” investment. It also helps planners to identify and invest in projects capable of addressing multiple needs, such as automated vehicle location (AVL) systems that can both improve on-road performance and inform customers of status conditions. In general, the Architecture offers regional stakeholders a basis for prioritizing ITS projects and making sound investment choices.

- **A Regional ITS Architecture satisfies the Federal mandate.** The mandate of the U.S. Federal Highway Administration (FHWA) requires that Regional ITS Architectures be completed by April 2005, in order for stakeholders in the Region to continue using Federal funds for the development and deployment of ITS projects. Consequently, promulgation of Regional ITS Architectures is necessary for continued access to Federal funds for ITS deployment.

### 1.4 ITS Standards

ITS standards are industry-consensus standards that define how system components operate within a consistent framework. By specifying how systems and components interconnect, ITS standards promote interoperability.

A seamless transportation system relies on clear communication between agencies, systems, and individuals. To ensure that different entities can communicate, the systems must be designed according to standards. For PennDOT, this might mean systems that can exchange data between regional and statewide centers. At the local level, this can mean data exchanges between jurisdictions concerning incidents, congestion, and signal timing plans.

An interoperable and seamless transportation system provides several benefits. Transportation agencies are now increasingly communicating with law enforcement, as police are usually the first to learn of incidents. Many transportation agencies are linking their transportation management centers with police dispatch. When systems are interoperable, police and emergency units can respond faster to crashes; this often relieves congestion and improves safety. In an emergency, quick and reliable communication is even more crucial.

To accrue the benefits noted above, systems and the underlying equipment must be designed according to standards that enable interoperability. Future systems and
equipment should be designed to meet these standards. Existing systems and equipment, additionally, should be updated to meet the standards.

The USDOT’s ITS Standards Program is working with existing standards development organizations (SDO’s) to establish a national collection of ITS standards. The following organizations participate in ITS standards activities:

- AASHTO (American Association of State Highway and Transportation Officials)
- ASTM (American Society for Testing and Materials)
- IEEE (Institute of Electrical and Electronics Engineers)
- ITE (Institute of Transportation Engineers)
- NEMA (National Electrical Manufacturers Association)
- SAE (Society of Automotive Engineers)

The following organization oversees the development of ITS standards:

- ANSI (American National Standards Institute)

For more information on ITS standards, visit www.standards.its.dot.gov or www.ntcip.org.

To identify ITS standards applicable to the District 2-0 Regional ITS Architecture, visit the National ITS Architecture website. This site provides a listing of all National ITS Architecture information flows and their associated standards. A District 2-0 ITS Architecture user can access applicable ITS standards by:

1. Viewing the information flow diagrams in the District 2-0 Regional ITS Architecture document.


3. Identifying a specific Architecture Flow, by name, in the Regional ITS Architecture document, clicking on that Architecture Flow name on the National ITS Architecture website, and the reviewing the details under “Standard Activities.”

The current ITS standards—or pertinent standards activities—will be displayed for the information flow that the user specifies.

1.5 Maintaining the Architecture

As ITS projects are planned and implemented, the Regional ITS Architecture was completed in 2004 and has been updated to reflect the new ITS priorities and strategies emerging through the transportation planning process. The completion of the Regional Operations Plan (ROP) in 2007 identified more projects for the District 2-0 Region. The Regional ITS Architecture is not a static document, but rather is a “living” document.
The ITS Architecture must grow and adapt as plans change, ITS projects are implemented, and ITS needs and services evolve in the Region.

In order to serve as a regional framework, the Regional Architecture must be maintained so that it continues to reflect the current and planned ITS systems, interconnections, etc. The following circumstances or conditions may all trigger the need to make changes to the Architecture:

- **Changes in Regional needs.** Regional ITS Architectures are created to support transportation planning in addressing regional needs. Over time, these needs can change and the corresponding aspects of the Regional ITS Architecture that address these needs may have to be updated. These changes in needs will also typically be expressed in updates to planning documents, such as regional transportation plans.

- **New stakeholders.** As new stakeholders become active in ITS, the Regional ITS Architecture should be updated to reflect their place in the regional view of ITS elements, interfaces, and information flows. Why might new stakeholders emerge? The stakeholders might represent new organizations that were not in place during the original Architecture development. Maybe the geographic scope of the Architecture is being expanded, bringing in new stakeholders. Perhaps additional transportation modes or transportation services are being considered that touch the systems of additional stakeholders.

- **Changes in scope of services considered.** The range of services considered by the Regional ITS Architecture expands. This might happen because the National ITS Architecture has been expanded and updated to include new user services or to better define how existing elements satisfy the user services. A Regional ITS Architecture based on an earlier version of the National ITS Architecture should take into consideration these changes as the Regional ITS Architecture is updated. The National ITS Architecture may have expanded to include a user service that has been discussed in the Region, but not included in the Architecture, or was included in a cursory manner. Changes in the National ITS Architecture are not, of themselves, a reason to update a Regional ITS Architecture, but the Region may want to consider new services in the context of their regional needs.

- **Changes in stakeholder or element names.** An agency’s name, or the name used to describe their element(s), undergoes change. Transportation agencies occasionally merge, split, or just rename themselves. In addition, element names may evolve as projects are defined. The Regional ITS Architecture should be updated to use the current names for both stakeholders and elements.

- **Changes in other Architectures.** A Regional ITS Architecture covers not only elements and interfaces within the Region, but also interfaces to elements in adjoining Regions. Changes in the Regional ITS Architecture in one Region may necessitate changes in the Architecture in an adjoining Region to maintain consistency between the two.
There are also several changes relating to project definition that will cause the need for updates.

- **Change due to project definition or implementation.** When actually defined or implemented, a project may add, subtract, or modify elements, interfaces, or information flows from the Regional ITS Architecture. Because the Regional Architecture is meant to describe the current (as well as future) regional implementation of ITS, it must be updated to accurately reflect how the developed projects integrate into the Region.

- **Change due to project addition/deletion.** Occasionally a project will be added or deleted through the planning process, or even during project delivery. Some aspects of the Regional ITS Architecture that are associated with the project may be expanded, changed, or removed.

- **Change in project priority.** Due to funding constraints or other considerations, the planned project sequencing may change. Delaying a project may have a ripple effect on other projects that depend on it; conversely, raising the priority for a project’s implementation may impact other projects that are related to it.

The purpose of maintaining the Architecture is to keep it current and relevant, so that stakeholders will use it as a technical and institutional reference when developing specific ITS project plans. In order to maintain the Architecture, three decisions must be discussed:

- **Who** — Who will lead and implement the maintenance effort?
- **When** — When will the Regional ITS Architecture change be updated?
- **What** — What parts of the Regional ITS Architecture will be maintained?
- **How** — How will the Architecture be maintained?

**Who Will Maintain the Architecture?**

In cooperation with the Pennsylvania ITS Architecture Regions, PennDOT Central Office expects to utilize a statewide approach to maintaining the Commonwealth’s nine Regional ITS Architectures. Although PennDOT Central Office will lead the maintenance effort in the District 2-0 Region, all stakeholders will still need to participate in the process. Maintenance of the Architecture is a recurring, long-term effort that requires inputs from all stakeholders in the Region.

**When Will the Architecture be Updated?**

The Regional ITS Architecture is expected to be updated every four years to coincide with updates to long-range plans throughout the Commonwealth. There will be a process planning effort prior to the update in order to ensure statewide consistency of the updates. This timeframe will be used throughout the state.
What Will be Maintained?

The constituent parts of the Regional ITS Architecture that will be maintained is referred to as the “baseline.” The baseline of the Regional ITS Architecture for the District 2-0 Region includes:

- **Description of the Region.** This description includes the geographic scope, functional scope, and architecture horizon. Geographic scope defines the ITS elements within the Region. Functional scope defines which services are included. Architecture horizon is the distance (in years) into the future that the Architecture will consider.

- **Regional ITS Projects Matrix.** The matrix includes a list of existing and planned ITS projects for the Region.

- **List of stakeholders.** The listing and description of ITS Stakeholders in the Region should be revised as stakeholders evolve, consolidate, or separate.

- **List of elements.** The inventory of ITS elements is a key aspect to the Architecture. Changes in stakeholders, as well as operational concepts, may impact the inventory of elements. Furthermore, implementation and planning status may change (i.e., change from planned to existing).

- **Systems Inventory.** Links the ITS Projects Matrix to Regional elements. Additionally, the Systems Inventory defines the functionalities of the elements.

- **Needs and Services Tables.** The Needs and Services Tables define the existing and future flow of information being shared between elements. The Needs and Services tables serve as the building blocks for the programming/building of the Architecture.

- **Interconnect diagrams.** Interfaces between elements define the interactions between one another. They provide information on “who” is talking to “whom.”

- **Information flow diagrams.** Information flows between elements define the details of the Architecture. They are the detailed description of how elements interact or will interact in the future. This is the key aspect of the baseline and will likely see the greatest amount of change.

- **Applicable ITS Standards.** The selection of standards depends on the information exchange requirements. The maintenance process should consider how ITS standards may have evolved and matured since the last update.
How Will the Architecture be Maintained?

PennDOT Central Office will be responsible for updating the aforementioned parts of the Regional ITS Architecture. In order to document the necessary changes to the Regional ITS Architecture, the Pennsylvania ITS Architecture website (www.paits.org) will be utilized as a tool for tracking changes to the Architecture.

All stakeholders in the Region involved in ITS project activity will be responsible for documenting additions, changes, and updates to the ITS Architecture.

To document an update, go to the District 2-0 Regional ITS Architecture Homepage (http://www.penndot2its.org/) and follow these steps:

1. Select the “Architecture Update Form” at the top of the screen. This link takes you to the requisite form.
2. Complete the “Architecture Update Form.” The form, shown on the following page allows a stakeholder to suggest an update to the Architecture. The form is broken into five sections: (1) Contact Information, (2) New ITS Project, (3) New Stakeholder, (4) New Element, and (5) Other Changes. Each section is described below:
   - **Contact Information** — Contains contact information (name, organization, email, and phone number) so that the stakeholder submitting the form can be contacted in the future.
   - **New ITS Project** — Future ITS projects considered for State and/or Federal funding should be documented in this section. Project name, stakeholder, type of funding requested, location, deployment date, and a brief description of the project should be inputted here.
   - **New Stakeholder** — Requests for new stakeholders and changes to stakeholder names/descriptions should be identified in this section of the form. The status, existing or planned, should also be identified.
   - **New Element** — Requests for a new element and changes to element names/descriptions should be identified in this section of the form. The status, existing or planned, should also be identified.
   - **Other Changes** — Other changes to the Regional ITS Architecture can be documented in this section.
3. Submit the “Architecture Update Form.” The form can be submitted by clicking on the “Submit” button on the bottom of the webpage. Once submitted, the form will be sent to the webmaster who will compile the information. The information will be utilized for the next update to the Regional ITS Architecture.
4. Once the “Architecture Update Form” has been submitted, the information will be sent to the webmaster. The webmaster will compile the information and post it
on the Architecture website. Once posted, the information can be accessed by (1) clicking on the “update list” link at the top of the “Architecture Maintenance Form” webpage or (2) going to http://paits.org/sa/update.htm.
# District 2-0 ITS Architecture Maintenance Form

## Contact Information

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| Project Description:  | |
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## New Stakeholder

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## Other Changes

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Contact the [PAITS Webmaster](mailto:PAITSWebmaster) with questions and comments.
1.6 Moving Forward/Institutionalizing ITS

Across the State, PennDOT has enjoyed strong commitment to ITS deployment initiatives, some through traditional funding mechanisms and most through federal funds earmarked for ITS. In virtually all Regions, there is an increasing emphasis on regional deployments and coordination among public agencies, illuminated by the cooperative effort displayed by the creation of Regional ITS Architectures. An integral part of the ITS planning, agency coordination, and program development activities is the cooperation and coordination with PennDOT Districts, MPO’s and/or RPO’s throughout the State that overlap, and regional stakeholders.

The application of advanced technologies to solve some of the transportation-related problems was first initiated by staff from DVRPC in the Philadelphia Region a few decades ago. Since then, there is a fully integrated system in place in Pittsburgh and operation centers are being explored in many other areas of the State. However, only since 2002, has there been a concerted effort to consolidate all of the individual ITS efforts by each agency and jurisdiction into a comprehensive and consolidated plan, starting with the creation of Regional ITS Architectures for each Region of the State that are coordinated and have statewide consistency.

Each regional agency represented in these Regional ITS Architectures has unique responsibilities for planning, operating, maintaining, or monitoring the transportation system.

Responsibility for, and involvement with, ITS by key agencies in the District 2-0 Region has become a joint effort between PennDOT Districts, MPO’s, and regional stakeholders. These groups, together, have assumed responsibility for coordinating regional ITS planning and deployment.

Figure 1-3 shows a map of the current PennDOT district boundaries by county. Figure 1-4 shows a map of the current MPO and RPO boundaries by county. The purpose of these figures is to give the reader context into the PennDOT district and MPO boundaries.
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Figure 1-3: PennDOT District Map

Figure 1-4: Pennsylvania MPO/RPO Map
**Mainstreaming**

To date, there have been ITS plans in place to cover a few metropolitan areas across the Commonwealth of Pennsylvania. These early plans have led to isolated, non-integrated ITS equipment being scattered throughout the State, except for in the Pittsburgh and Philadelphia Regions. The current deployments have primarily been PennDOT led. The ITS projects deployed to date have already produced important benefits for PennDOT and the traveling public. Unfortunately they have also led to questions about integration across boundaries and the costs, in labor and resources, associated with operating and maintaining these technology deployments.

The Regional ITS Architecture effort has helped to begin addressing these issues by, first, bringing regional agencies to the table to discuss regional technology deployment. Secondly, the Architectures have built a regional foundation for understanding the needs, applications, and linkages to the technologies that are currently deployed or scheduled to be deployed. Lastly, the ITS Architectures will set the stage for “mainstreaming” to occur.

“Mainstreaming” is, simply, getting technology issues in the transportation environment in front of the representative regional bodies for discussion, analysis, and decision making, in the same way that traditional transportation improvements are processed. ITS and operations can no longer be considered just a PennDOT initiative, but must now be viewed as requiring regional input.

Throughout the State, MPO’s and RPO’s will work with PennDOT and other regional stakeholders to include ITS as part of long-range plans that eventually spill into regional and statewide Transportation Improvement Programs (TIP’s). MPO’s and RPO’s should strive to go beyond the basic federal requirement of including transportation projects receiving certain types of federal funds in a Region’s TIP and use the TIP to highlight ITS projects. Project evaluation criteria used to select projects might now be modified in order for ITS projects to be fairly evaluated. Most traditional selection processes to date have excluded valuable ITS projects by not considering the regional needs and benefits associated with technology projects.

There are key factors that can contribute to increased coordination and mainstreaming of ITS within the transportation planning process throughout the Commonwealth of Pennsylvania:

- Creating and utilizing committees or task forces that foster ITS discussions and open communications.

- Cultivating support for ITS deployments, coordination, and integration from the administrators of influential state and regional transportation agencies.

- Creating committees to target coordination, integration, technical, and policy issues.

- Learning from previous ITS deployments.
• Instilling trust in representatives of area agencies in the responsibilities and performance of the MPO, RPO, PennDOT, and regional stakeholder staff that enable them to mainstream ITS and coordinate the area’s ITS/Operations efforts.

• Encouraging advocacy for ITS initiatives among top managers.

• Incorporating ITS projects in the Region’s long-range transportation plans.

• Developing ITS programs and plans.

• Utilizing the Regional ITS Architecture.

• Including ITS projects within the TIP.

• Utilizing enhanced criteria for selecting ITS projects for inclusion in the TIP.

• Educating elected officials and agency administrators in ITS terminology and strategies.

• Educating other prime stakeholders (beyond traditional transportation agencies) about ITS.

• Educating MPO and RPO staff about ITS.

• Conducting scanning reviews to ITS deployments in external regions and states.

**MPO, RPO, and PennDOT Role**

Throughout the State, transportation officials can look to the MPO/RPO to function in the role of ITS facilitator, ITS educator, and ITS project funding prioritizer. The MPO/RPO is often best able to provide a regional context for projects in geographic areas with many political boundaries and to better understand the experiences of a traveling public that tends to have minimal interest in the jurisdictions they pass through. The MPO/RPO has historically been able to recognize the different philosophies of sub-regions and fuse these philosophies into common goals and priorities when working on regional projects. In addition, the MPO/RPO offers a direct conduit to the politicians and is, therefore, seen as the only entity fully capable of educating elected officials about ITS regional applications.

MPO/RPO staff members must recognize, however, that their involvement with specific ITS projects relies on invitations to participate from the sponsoring agencies, such as PennDOT. Inclusion in non-planning activities is generally possible because the MPO/RPO staff have an established record of being knowledgeable, cooperative, and trustworthy. The MPO/RPO staff has earned the respect of the Region not only from their collective knowledge and responsiveness, but also because they have not overreached their authority. Indeed, when the MPO/RPO staff is knowledgeable about ITS applications, good listeners, and not prone to pressing a narrow agenda, the
process to mainstreaming ITS products and services is much simpler since the agency most attuned to the transportation planning process is also the agency most trusted. These conditions may prove to be the most critical toward mainstreaming ITS in the transportation planning process.

**Regional ITS Coordination Committees**

Regional agencies should consider coordinating all regional ITS efforts into a single regional operations plan. To do this, a committee composed of transportation agencies and operators should be formed. There should be a policy body and a technical body to the committee. This plan should then be used as input into the regional long-range plan.

Elected officials and transportation managers sometimes use or form committees through which they act as regional advocates for ITS. These can be non-profit government organizations composed of elected officials, as well as business interests. The primary goal of these committees is generally to use technology to improve mobility through political and project advocacy. On an annual basis, the committee members adopt a set of projects with regional significance; these include ITS products and services promoted to municipal managers and local transportation officials.

In some metropolitan areas around the country, elected officials and transportation managers have personally taken on the responsibility to act as advocates for ITS products and services. Strong leadership from top management of transportation providers can elevate ITS throughout the Region.

ITS technologies tend to be most useful when planned and deployed from a regional perspective that cuts across geographic boundaries, agencies, and transportation modes. A wide range of stakeholders should have input into ITS planning and deployment activities since many of these agencies will be required to operate these systems or provide coordination and information to enable these systems to function efficiently. This requires elected officials and staff within—and across agencies—to communicate and coordinate with one another. It can, however, be difficult to plan for and deploy ITS within a Region, especially in areas comprised of many local autonomous communities.

One role of a regional committee is to aid in coordinating ITS activities across jurisdictions and agencies. In keeping with the coordinating role, the committee can form a workgroup to improve procedures for incident clearance and make the procedures more uniform within the Region. The workgroup can consist of law enforcement personnel, MPO staff, DOT staff, and officials from select municipalities.

**Endorsement of ITS**

Public endorsement of ITS products and services demonstrates to all regional stakeholders that ITS is accepted as a tool to solve transportation problems and will be seriously considered as a funding option in the Region’s transportation planning process. Elected officials are the most important people from whom to garner support for ITS since they make funding decisions and can influence support by other stakeholders. It is also important for mid- and upper-level transportation managers to support ITS since
they inform elected officials and guide funding decisions within their respective transportation organizations. To gain their support, elected officials and transportation managers need to be provided with data and information that define ITS products and services, explain how the technologies are used, and detail the benefits of ITS that can potentially accrue.

In the District 2-0 Region, regular updates from the MPO’s to elected officials should be considered during ITS program planning, and implementation. For example, to secure support, the MPO’s can brief officials on the logical arguments supporting freeway management in order to receive congestion information and show relationships among incidents, congestion, and air pollution. Local problems can be highlighted and then examined in terms of how ITS products and services can help solve these problems. The message is that transportation professionals in the Region should aggressively manage traffic and focus on reliability and mobility.

**Education**

Education can improve coordination across jurisdictions and modes in several ways, including increasing awareness of ITS products and services, reducing tensions between agencies representing different transportation modes, and getting planners and operations staff to understand each other’s responsibilities and terminology. A lack of awareness of ITS products and services, and their associated benefits, hinders the routine consideration of ITS technologies in a Region’s planning and deployment processes. Until a few years ago, ITS education was primarily the responsibility of each agency considering ITS. However, MPO staff should consider taking the lead in creating and providing programs to educate regional stakeholders.

There are many forums available for educating and training transportation professionals in ITS, and not all require a formal classroom setting. For instance, “scanning tours” take place outside a classroom. These tours enable participants to learn how to use the technologies and then interject some first-hand knowledge about the equipment being analyzed into the ITS discussion. Invitees to these scanning tours can consist of:

- County commissioners,
- Executive boards,
- Policy boards,
- Transit operations staff,
- MPO staff,
- Politicians, and
- Public safety officials.

A mixture of upper management, operations, and policy people should be considered. Scanning tours should be taken at the beginning of regional planning efforts or when exposure is needed in advance of a specific project to help decision-makers conceptualize what they need. Elected officials and transportation managers can also become educated about ITS technologies, products, and services by participating on regional, statewide, or national committees, especially those established to consider ITS solutions.
Training courses are available for stakeholders in the Region to learn more about ITS. Such courses are available through the National Highway Institute (NHI) at the following website:

http://www nhi fhwa dot gov/default asp

National ITS Architecture and Turbo Architecture training are available through the U.S. Department of Transportation. Information on training can be found at the following website:

http://itsarch iteris com/itsarch/html/training/training htm
2 Architecture Scope

This section summarizes the study’s scope of services and identifies the matrix used to assess “conformity.” The Conformity Matrix, developed by the Statewide Working Group, is specific to Pennsylvania and has been used in every Region across the Commonwealth to ensure statewide consistency. Descriptions of the Region, regional stakeholders, and existing regional ITS projects are also included in this section.

2.1 Scope of Services

At the outset of the study, the District 2-0 Architecture Region’s Regional Advisory Panel (RAP) determined that the Region would need to work through all five of the study tasks required to develop the Regional ITS Architecture. The five tasks are:

- Define an Architecture Scope,
- Inventory Systems and Define Needs, Services, and an Operations Coverage,
- Generate a Strawman Regional ITS Architecture,
- Conduct Outreach to Validate the Regional ITS Architecture, and
- Finalize the Regional ITS Architecture.

Consistent with its mandate, the RAP oversaw execution of the Architecture development methodology.

2.2 Conformity Matrix

The Pennsylvania Architecture Checklist, specified in the Phase I Report, that preceded the Architecture study, was used to verify compliance of the District 2-0 Regional ITS Architecture with the prescribed methodology. By checking off the bulleted list of outputs and considerations in the checklist tables, below, a Region and State ensures conformity with the Federal Mandate and consistency among the Architectures.

Compliance of the District 2-0 Regional ITS Architecture with the Pennsylvania Architecture Checklist is validated in the following tables:
### Checklist Table #1

<table>
<thead>
<tr>
<th>Key Task To Complete</th>
<th>Key Outputs from Task to Include in Regional ITS Architecture (Do we have?)</th>
<th>Considerations and Conformity &amp; Validation Checks (Did we consider and address?)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Define the Regional Architecture Scope</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Description-of-region map and text, that includes:</td>
<td>✓ Has a Regional Champion been identified?</td>
</tr>
<tr>
<td></td>
<td>✓ Geographic area (Districts, Counties, Cities, Corridors)</td>
<td>✓ Have traditional, existing, transportation planning documentation been reviewed?</td>
</tr>
<tr>
<td></td>
<td>✓ Service boundaries, major roadway systems</td>
<td>✓ Is there consistency between regional scope and transportation plans?</td>
</tr>
<tr>
<td></td>
<td>✓ Relationship among jurisdictions within Region</td>
<td>✓ Is there consistency between Regional scope and National ITS Architecture</td>
</tr>
<tr>
<td></td>
<td>✓ Relationship to adjacent Regions and jurisdictions</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Existing projects matrix (key projects only), that includes:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Project description</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Impacts on Region</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ ITS components</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Timetables</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Scope of services summary (If Not Previously Developed), that includes:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Regional stakeholders list</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Owners and operators of ITS systems in Region</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Entities with stake or interest in Regional transportation issues</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Conformity requirements matrix</td>
<td></td>
</tr>
</tbody>
</table>

### Checklist Table #2

<table>
<thead>
<tr>
<th>Key Task to Complete</th>
<th>Key Outputs from Task to Include in Regional ITS Architecture (Do we have?)</th>
<th>Considerations and Conformity &amp; Validation Checks (Did we consider and address?)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Develop an Inventory of Regional Systems &amp; Define Regional Needs, Services, and Operational Concept</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ System inventory, that includes:</td>
<td>✓ Is there completeness and consistency of the inventory among stakeholders?</td>
</tr>
<tr>
<td></td>
<td>✓ System name(s)</td>
<td>✓ Is the conformity to and compatibility with the Architecture?</td>
</tr>
<tr>
<td></td>
<td>✓ Descriptions</td>
<td>✓ Has the Region considered the following:</td>
</tr>
<tr>
<td></td>
<td>✓ Status (existing or planned)</td>
<td>✓ System operations that extend beyond Regional boundaries</td>
</tr>
<tr>
<td></td>
<td>✓ Associated subsystems/terminators in National ITS Architecture</td>
<td>✓ Impacts on contiguous Regions or jurisdictions</td>
</tr>
<tr>
<td></td>
<td>✓ System owner/operator (stakeholders and system elements)</td>
<td>✓ Operational characteristics along corridors and at local levels</td>
</tr>
<tr>
<td></td>
<td>✓ Needs and services summary, that includes:</td>
<td>✓ Locations and operational characteristics of planned traffic operations centers (TMC)</td>
</tr>
<tr>
<td></td>
<td>✓ Regional needs</td>
<td>✓ Working relationship among stakeholder organizations</td>
</tr>
<tr>
<td></td>
<td>✓ ITS services (planned or implemented)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Operations coverage that includes:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Operational roadways.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>✓ Assignment of operational coverage</td>
<td></td>
</tr>
</tbody>
</table>
## Checklist Table #3

<table>
<thead>
<tr>
<th>Key Task to Complete</th>
<th>Key Outputs from Task to Include in Regional ITS Architecture (Do we have?)</th>
<th>Considerations and Conformity &amp; Validation Checks (Did we consider and address?)</th>
</tr>
</thead>
</table>
| Generate Strawman (Rough Draft) Architecture | ✓ Develop a Regional systems interconnect summary, that includes:   
✓ Diagram of actual and potential connections between subsystems   
✓ Connection status (existing or planned) for each connection | ✓ Have the interconnections and information exchanges across Regional boundaries been identified? |
|                      | ✓ Develop Regional information flow diagrams, that include:   
✓ Descriptive name for the information   
✓ Information flow status (existing or planned)   
✓ Direction of information flow | ✓ Has the ability of the communications infrastructure to support the proposed interconnections been addressed at a high-level? |
|                      | ✓ Develop a Regional Strawman Architecture, that includes:   
✓ Architecture approach   
✓ Needs & services   
✓ Systems inventory   
✓ Interconnects   
✓ Information flows | ✓ Is there completeness and consistency in the interconnects summary? |

## Checklist Table #4

<table>
<thead>
<tr>
<th>Key Task to Complete</th>
<th>Key Outputs from Task to Include in Regional ITS Architecture (Do we have?)</th>
<th>Considerations and Conformity &amp; Validation Checks (Did we consider and address?)</th>
</tr>
</thead>
</table>
| Conduct Outreach to Validate Architecture | ✓ Develop Stakeholders’ guide to Regional Architecture, that could include:   
✓ Background on Regional Architecture project   
✓ Stakeholder review and validation process   
✓ Glossary of technical terms | ✓ Have real-world and program issues been considered? |
|                      | ✓ Documentation of stakeholder inputs | ✓ Have any unusual institutional Issues been identified? |
|                      | ✓ Refined and validated Architecture | ✓ Have any specialized data-sharing requirements been identified? |
|                      |                                      | ✓ Have political considerations been identified? |
|                      |                                      | ✓ Have any other unique conditions, circumstances, or issues in the Region been identified? |
|                      |                                      | ✓ Have Stakeholders from areas contiguous to the Region been involved? |
|                      |                                      | ✓ Is there conformity with FHWA Regional ITS Architecture Assessment Criteria? |
2.3 Description of the Region

This Region, in the north central part of the state, is comprised of nine counties: Cameron, Centre, Clearfield, Clinton, Elk, Juniata, McKean, Mifflin, and Potter. The District 2-0 Region encompasses PennDOT Engineering District 2-0 and is depicted in Figure 2-1.

The setting is primarily rural with the exception of State College Borough, which has a population exceeding 50,000 and can be described as an urban area. Centre County is part of a Metropolitan Planning Organization (MPO). Clinton County is its own Rural Planning Organization (RPO). McKean, Potter, Elk, Cameron, and Clearfield counties make up the North Central Rural Planning Organization (along with Jefferson County in

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**Figure 2-1: District 2-0 ITS Architecture Region**

The setting is primarily rural with the exception of State College Borough, which has a population exceeding 50,000 and can be described as an urban area. Centre County is part of a Metropolitan Planning Organization (MPO). Clinton County is its own Rural Planning Organization (RPO). McKean, Potter, Elk, Cameron, and Clearfield counties make up the North Central Rural Planning Organization (along with Jefferson County in
Table 2-1 reveals that over four hundred and thirty thousand people — or approximately three and a half percent of statewide residents of the Commonwealth of Pennsylvania — live in the District 2-0 ITS Architecture Region. Approximately one-third of the Region’s population resides in Centre County, with the remainder scattered among the other eight counties of the Region.

<table>
<thead>
<tr>
<th>County</th>
<th>% Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameron</td>
<td>1%</td>
</tr>
<tr>
<td>Centre</td>
<td>32%</td>
</tr>
<tr>
<td>Clearfield</td>
<td>19%</td>
</tr>
<tr>
<td>Clinton</td>
<td>9%</td>
</tr>
<tr>
<td>Elk</td>
<td>8%</td>
</tr>
<tr>
<td>Juniata</td>
<td>5%</td>
</tr>
<tr>
<td>McKean</td>
<td>11%</td>
</tr>
<tr>
<td>Mifflin</td>
<td>11%</td>
</tr>
<tr>
<td>Potter</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Total Population in the District 2-0 Region</strong></td>
<td><strong>431,463</strong></td>
</tr>
</tbody>
</table>

(Source: U.S. Census Bureau, 2000)

Table 2-2 compares specific population traits in the District 2-0 to those across Pennsylvania and the U.S. generally. For instance, the Region is decidedly more homogeneous than either the statewide or national populations — only 2.7 percent of the District 2-0 residents are classified as minorities. The Region’s median age is about the same as the state average (40 years old), but both skew older than the national median age (35 years old). Also, mean family size is slightly smaller, and per capita income is lower in District 2-0 than across Pennsylvania or the U.S.

<table>
<thead>
<tr>
<th>Demographic Factor</th>
<th>D 2-0 Region</th>
<th>Pennsylvania</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Population</td>
<td>431,463</td>
<td>12,281,054</td>
<td>281,421,906</td>
</tr>
<tr>
<td>% Minority Population</td>
<td>2.7%</td>
<td>14.6%</td>
<td>24.9%</td>
</tr>
<tr>
<td>Median Age (In Years)</td>
<td>37.9</td>
<td>38.0</td>
<td>35.3</td>
</tr>
<tr>
<td>Mean Family Size</td>
<td>2.97</td>
<td>3.04</td>
<td>3.14</td>
</tr>
<tr>
<td>Per Capita Income</td>
<td>$16,496</td>
<td>$20,880</td>
<td>$21,587</td>
</tr>
</tbody>
</table>

(Source: U.S. Census Bureau, 2000)

Table 2-3 examines commuting patterns in the Region to the state and national commuting conditions. Approximately three-fourths of District 2-0 workers drive to work...
alone, about the same as the state and national “drive-alone” rates. Thirteen percent of workers in the Region carpool to work, which is slightly higher than the statewide average. Less than one percent of workers use public transportation; considerably less than state and national transit usage trends. The average one-way commute time for the District 2-0 ITS Architecture Region workers is 22 minutes, which compares favorably to the 25-26 minutes for Pennsylvania and U.S. workers generally.

Table 2-3: Comparison of Commuting Patterns Among Workers 16 & Over District 2-0 ITS Architecture Region, Pennsylvania, and the United States

<table>
<thead>
<tr>
<th>Commuting Pattern</th>
<th>D 2-0 Region</th>
<th>Pennsylvania</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Workers 16 &amp; Over</td>
<td>175,142</td>
<td>5,556,311</td>
<td>128,279,228</td>
</tr>
<tr>
<td>% Commuters Driving Alone</td>
<td>76.5</td>
<td>76.5%</td>
<td>75.7%</td>
</tr>
<tr>
<td>% Commuters Carpooling</td>
<td>13.2%</td>
<td>10.4%</td>
<td>12.2%</td>
</tr>
<tr>
<td>% Commuters Using Public Transportation</td>
<td>0.7%</td>
<td>5.2%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Mean Travel Time to Work (Minutes)</td>
<td>22.0</td>
<td>25.2</td>
<td>25.5</td>
</tr>
</tbody>
</table>

(Source: U.S. Census Bureau, 2000)

As shown in Table 2-4, the District 2-0 Region encompasses a substantial network of roadways. As reported in PennDOT’s 2005 Highway Statistics, the Region contains 9,762 linear miles of roadway, signifying 8.1 percent of the Commonwealth’s total linear mileage. This includes 3,501 linear miles of roadway maintained by PennDOT, with the remaining road miles maintained by the municipalities, etc.

Table 2-4: District 2-0 ITS Architecture Region Linear Miles

<table>
<thead>
<tr>
<th>County</th>
<th>PennDOT Linear Miles</th>
<th>Total Linear Miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameron</td>
<td>112.7</td>
<td>312.5</td>
</tr>
<tr>
<td>Centre</td>
<td>575.5</td>
<td>1,707.5</td>
</tr>
<tr>
<td>Clearfield</td>
<td>802.8</td>
<td>2,065.3</td>
</tr>
<tr>
<td>Clinton</td>
<td>296.1</td>
<td>1,079.5</td>
</tr>
<tr>
<td>Elk</td>
<td>293.1</td>
<td>829.6</td>
</tr>
<tr>
<td>Juniata</td>
<td>354.9</td>
<td>734.9</td>
</tr>
<tr>
<td>McKean</td>
<td>381.7</td>
<td>1,024.5</td>
</tr>
<tr>
<td>Mifflin</td>
<td>239.7</td>
<td>713.7</td>
</tr>
<tr>
<td>Potter</td>
<td>444.9</td>
<td>1,294.2</td>
</tr>
<tr>
<td>Regional Total</td>
<td>3,501.4</td>
<td>9,761.7</td>
</tr>
<tr>
<td>Statewide Total</td>
<td>39,889.6</td>
<td>120,667.2</td>
</tr>
</tbody>
</table>

Table 2.5 depicts the daily vehicle miles of travel (DVMT) across the Region, which is substantial. Total DVMT on all roadways in the Region, as reported in the 2005
Highway Statistics was approximately 14.3 million miles. The DVMT on PennDOT roadways was approximately 11.2 million miles.

### Table 2-5: District 2-0 Daily Vehicle Miles of Travel

<table>
<thead>
<tr>
<th>County</th>
<th>PennDOT DVMT</th>
<th>Total DVMT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cameron</td>
<td>107,652</td>
<td>202,780</td>
</tr>
<tr>
<td>Centre</td>
<td>3,406,746</td>
<td>4,264,604</td>
</tr>
<tr>
<td>Clearfield</td>
<td>2,673,931</td>
<td>3,165,281</td>
</tr>
<tr>
<td>Clinton</td>
<td>1,303,410</td>
<td>1,855,703</td>
</tr>
<tr>
<td>Elk</td>
<td>763,852</td>
<td>1,054,834</td>
</tr>
<tr>
<td>Juniata</td>
<td>710,975</td>
<td>808,421</td>
</tr>
<tr>
<td>McKean</td>
<td>790,443</td>
<td>1,089,024</td>
</tr>
<tr>
<td>Mifflin</td>
<td>995,637</td>
<td>1,246,107</td>
</tr>
<tr>
<td>Potter</td>
<td>397,679</td>
<td>676,642</td>
</tr>
<tr>
<td><strong>Regional Total</strong></td>
<td><strong>11,150,325</strong></td>
<td><strong>14,363,396</strong></td>
</tr>
<tr>
<td><strong>Statewide</strong></td>
<td><strong>224,176,551</strong></td>
<td><strong>295,628,006</strong></td>
</tr>
</tbody>
</table>

The District 2-0 ITS Architect Region contains significant highway corridors as defined by the RAP, including:

### Table 2-6: Significant Highway Corridors

<table>
<thead>
<tr>
<th>Interstates</th>
<th>United States (U.S.) Routes</th>
<th>Pennsylvania (PA) Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interstate 80 (I-80)</td>
<td>US Route 6 (US-6)</td>
<td>PA Route 26 (PA-26)</td>
</tr>
<tr>
<td>Interstate 99 (I-99)</td>
<td>US Route 22 (US-22)</td>
<td>PA Route 28 (PA-28)</td>
</tr>
<tr>
<td></td>
<td>US Route 119 (US-119)</td>
<td>PA Route 120 (PA-120)</td>
</tr>
<tr>
<td></td>
<td>US Route 219 (US-219)</td>
<td>PA Route 144 (PA-144)</td>
</tr>
<tr>
<td></td>
<td>US Route 220 (US-220)</td>
<td>PA Route 449 (PA-449)</td>
</tr>
<tr>
<td></td>
<td>US Route 322 (US-322)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>US Route 522 (US-522)</td>
<td></td>
</tr>
</tbody>
</table>

The Region is also home to multiple transit providers, including:

- Centre Area Transit Agency (CATA)
- DuBois, Falss Creek, Sandy Township Joint Transportation Authority (DuFast)
- Area Transportation Authority of North Central Pennsylvania (ATA)
- STEP, Inc.
- Mifflin – Juniata Area Agency on Aging (MJAAA)
2.4 Regional Stakeholders

This section documents the Regional stakeholders defined by the RAP for inclusion and participation in the Regional ITS Architecture effort. Stakeholders are generally identified in terms of agencies and specific individuals in those agencies responsible for policy and operations. Agencies were selected by assessing the mission of operation of services related to the transportation system. Therefore Emergency Management Services (EMS), Incident Management (IM), ITS, Transit, and enforcement activities were all included. Planning agencies were included as well because capital and some Operations & Maintenance (O&M) funds are programmed through these agencies.

Aero Medical Transport Services: Life flight is a regional helicopter service designed to provide critically ill or injured patients rapid access to advanced life support care and rapid transportation to critical care facilities. The Life Flight Helicopters consist of American Eurocopter built BK-117 and Dauphin aircraft.

Area Transportation Authority of North Central PA: The Area Transportation Authority is successful in providing public transportation in the most rural region of the state of Pennsylvania (Cameron, Clearfield, Elk, Jefferson, McKean, and Potter counties). ATA has been improving its service to the six counties since its inception in 1976. ATA provides easy mobility to the public, which stimulates retail business sales and supports private industry by moving hundreds of commuters every working day of the year. Public transit decreases traffic congestion, wear and tear on highways, and accidents, all of which hold insurance premiums down.

Centre Area Transportation Authority: The Centre Area Transit Agency (CATA) coverage areas include seven municipalities in Centre County. CATA is the primary transportation provider for Penn State University (PSU). It serves an annual ridership of over 6,000,000 with 38,000 (less than 1%) of those trips being demand responsive.

Centre County Office of Transportation Services: The Centre County Office of Transportation Services provides only demand-responsive transit service within the CATA service area, but perhaps more importantly, in areas of Centre County not served by CATA. They provide trips to neighboring counties as well.

Centre County Metropolitan Planning Organization (CCMPO): The Centre County Metropolitan Planning Organization (CCMPO) basic responsibility is to approve the use of Federal funds for specific highway and mass transit projects within its geographic boundary. This responsibility is fulfilled through the development and adoption of the short-range Transportation Improvement Program (TIP).

Counties: Cameron, Centre, Clearfield, Clinton, Elk, Juniata, McKean, Mifflin, and Potter county government operations within the D2-0 Region. Departments typically having an impact on the transportation system include incident and emergency management agencies such as county police, fire, EMS, 911, and EMA's, as well as County planning departments.

DuFast Transit Authority: DuFast serves three communities (DuBois, Falls Creek, Sandy Township) in the northwest portion of Clearfield County. DuFast provides services on three fixed routes as well as Paratransit Service.
**General Public:** The community or the people as a whole using the transportation system. The general public may be an automobile driver, transit passenger, computer, or cell-phone user obtaining travel information, or any other person interacting with the transportation system in the Region.

**HAZMAT Response Teams:** Private operators that do cleanup. (Fire departments are the first responders)

**Local Fleet and Freight Management Companies:** The Fleet and Freight Management subsystem provides the capability of commercial drivers and dispatchers to receive real-time routing information and access databases containing vehicle and cargo locations as well as carrier, vehicle, cargo and driver information. In addition, the capability to purchase credentials electronically shall also be provided, with automated and efficient connections to financial institutions and regulatory agencies, along with post-trip automated mileage and fuel usage reporting.

**Mifflin- Juniata Area Agency on Aging:** A shared-ride transportation program. Sharing means that you may sometimes have to leave home a little earlier or wait a little longer for your trip home so that trips can be co-ordinated. Transportation is provided between the hours of 8 a.m. to 4 p.m., Monday through Friday.

**Municipalities:** Municipal governments located within the region, whose responsibilities include traffic signal operations, traffic management, and emergency response (fire/police/EMS). Staffing and hours of service vary widely, from cities with a large staff that operate 24 hours per day, 7 days per week to townships with only a handful of paid staff that are only open 2-3 days per week during regular business hours.

**NCPRPDC:** The North Central Pennsylvania Regional Planning and Development Commission (NCPRPDC), serving as the Rural Transportation Planning Organization (RTPO), guides the transportation planning and programming process in Cameron, Clearfield, Elk, Jefferson, McKean and Potter counties. The RTPO, operating via an agreement with the Pennsylvania Department of Transportation, approves the development and implementation of highways, transit and other transportation facilities and services. The RTPO Planning Committee acts the authority on all regional transportation planning activities.

**PennDOT BHSTE:** PennDOT’s Bureau of Highway Safety and Traffic Engineering provides leadership, guidance, and support for advancing effective highway safety and congestion management efforts to meet the needs of our customers and partners.

**PennDOT Central Bureau of Maintenance and Operations:** This center collects weather information and road closure information from local county maintenance offices.

**Pennsylvania Emergency Management Agency (PEMA):** The Pennsylvania Emergency Management Agency (PEMA) coordinates state agency emergency response, including the Office of the State Fire Commissioner and Office of Homeland Security, to support county and local governments in the areas of civil defense, disaster mitigation and preparedness, planning, and response to and recovery from man-made and natural disasters. For more information, visit PEMA's website (http://www.pema.state.pa.us).
Pennsylvania Department of Transportation (PennDOT): The Pennsylvania Department of Transportation is the Commonwealth’s statewide transportation agency responsible for building, maintaining, and operating the state’s roads, bridges and tunnels. PennDOT consists of a single Central Office and 11 District Offices throughout the state.

PennDOT’s Central Office consists of several internal organizations, including the Bureau of Maintenance and Operations (BOMO), Motor Carrier Division, Bureau of Planning and Research (BPR), Bureau of Highway Safety and Traffic Engineering (BHSTE), Bureau of Licensing, Bureau of Motor Vehicles, Bureau of Freights and Rails, Bureau of Information Systems, Communication Office of Information Technology, and Press Office. PennDOT’s Central Office oversees statewide operations and is responsible for coordination of transportation services between the 11 Districts.

PennDOT’s District Offices are responsible for the design, operation, maintenance, and construction of state highways and bridges in their respective districts. For more information, visit PennDOT’s website (http://www.dot.state.pa.us).

Pennsylvania Office of Homeland Security: Pennsylvania Homeland Security addresses the security needs of the state. Developed in response to 9/11 the Homeland Security Office is focusing on a range of important security needs and services, including transportation-related issues. Potential high-threat topics — e.g., nuclear power plants, DOE shipments, chemical industry, major distribution of gas and electric utilities, and other target infrastructure — are all covered through the Office’s Homeland Security mission. Initially, the ITS Architecture focuses on security issues as part of incident management. In the future, as the Office’s mandate is refined, additional security services and needs are likely to be reflected in the Architecture.

Pennsylvania State Police (PSP): The Pennsylvania State Police is a full service statewide law enforcement agency that fulfills the law enforcement needs of the general public across the Commonwealth of Pennsylvania. Transportation services provided by the Pennsylvania State Police include: (1) incident response, (2) commercial vehicle inspections, and (3) law enforcement on state highways. For more information, visit the Pennsylvania State Police website (http://www.psp.state.pa.us).

Penn State University: Located in State College, the university offers research capabilities and qualified staff for ITS in the region. CITrans (Center for Intelligent Transportation Systems) is a multidisciplinary research effort under Pennsylvania Transportation Institute (PTI). The progress of ITS in the region will necessitate employment of qualified personnel in the operation and maintenance of the system components.

Regional EMS Councils: Emergency Medical Service providers. Do not have their own fleets. 911 centers do the dispatching. They collect operational data from the Local 911 Centers and analyze it for planning purposes.

SEDA-COG: SEDA-Council of Governments (COG) guides the transportation planning and programming process in the rural counties and municipalities of Clinton, Columbia, Juniata, and Mifflin, Montour, Northumberland, Snyder, and Union in Central Pennsylvania. SEDA-COG coordinates public information workshops, serves as a depository for transportation-related information, develops special studies, and assists PennDOT in carrying out its mission.
2.5 Regional ITS Projects

The Regional ITS Projects Matrix identifies ITS projects in the Region and provides a high-level description of the projects. The matrix denotes the status of each project, as follows:

- **Existing** — An ITS project that is deployed and operational.
- **Planned 1** — A future ITS project that is programmed or formally documented by the MPO, DOT, transit agency, police, or other transportation stakeholder.
- **Planned 2** — A future ITS project that is not programmed or documented.

The information on projects shown in the matrix (see Table 2-7) was collected from Regional or Municipal planning documents, or otherwise enunciated by members of the RAP. Regional stakeholders went through a process of defining projects as existing, planned 1, or planned 2. A planning horizon of 20 years was used as a criterion in determining those projects to include in the matrix.
### Table 2-7: Regional ITS Projects

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Project</th>
<th>Status</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Commercial Vehicle Companies</strong></td>
<td>Private Carrier</td>
<td>Existing</td>
<td>Commercial Vehicle Tracking System provides tracking information of all the trucks using the system. Commercial vehicles also have communication devices to communicate with the trucking agency on-route.</td>
</tr>
<tr>
<td><strong>Commercial Vehicle Companies</strong></td>
<td>Private Carrier Fleet Maintenance Management</td>
<td>Existing</td>
<td>This program provides capabilities to administer preventive maintenance schedules.</td>
</tr>
<tr>
<td><strong>Commercial Vehicle Companies</strong></td>
<td>FHWA Carrier Compliance Review</td>
<td>Existing</td>
<td>The FHWA Compliance Review process involves examining carrier records to ensure that the carrier meets all safety-related regulations and does not have unsafe operating practices.</td>
</tr>
<tr>
<td><strong>Counties</strong></td>
<td>County 911 Communications Centers</td>
<td>Existing</td>
<td>The County Communication Centers dispatch and manage resources for incidents.</td>
</tr>
<tr>
<td><strong>Counties</strong></td>
<td>County Emergency Management Agency Centers</td>
<td>Existing</td>
<td>The county EMA centers maintain an emergency operations center that can be activated to coordinate incident actions.</td>
</tr>
<tr>
<td><strong>Counties</strong></td>
<td>County 911 Communication Centers – Geographic Information System (GIS)</td>
<td>Existing and Planned 1</td>
<td>County EMA Centers use a GIS to map 911 calls. The GIS helps to provide automatic location of the street address of wire line calls, and in the future it will handle cellular call location (E911).</td>
</tr>
<tr>
<td><strong>Counties</strong></td>
<td>County/Regional Planning Department</td>
<td>Existing</td>
<td>This program provides planning services to various transportation related activities.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
</tr>
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</tr>
<tr>
<td>Counties</td>
<td>Congestion Management System Studies</td>
<td>Existing</td>
<td>The MPO/RPO conducts the congestion management system study to monitor the levels of service of traffic flow on congested highways and at intersections.</td>
</tr>
<tr>
<td>Counties</td>
<td>Events Monitoring</td>
<td>Existing</td>
<td>The MPO/RPO monitors increased traffic volumes on highways and at parking facilities and levels of service and congestion during peak events for planning purposes.</td>
</tr>
<tr>
<td>Counties</td>
<td>EMS, Fire, and Police Vehicles</td>
<td>Existing</td>
<td>These vehicles respond to the incident emergencies.</td>
</tr>
<tr>
<td>General Public</td>
<td>EZ Pass</td>
<td>Existing</td>
<td>This program allows the passenger vehicles to pay toll at the toll both without stopping.</td>
</tr>
<tr>
<td>General Public</td>
<td>Personal Traveler Information System</td>
<td>Existing</td>
<td>These systems allow users to access transportation related information through their personal information devices including personal computers, PDA etc.,</td>
</tr>
<tr>
<td>Municipalities</td>
<td>Traffic Signal Systems</td>
<td>Existing</td>
<td>Municipalities maintain the closed-loop and traffic responsive traffic signal systems in the region.</td>
</tr>
<tr>
<td>Municipalities</td>
<td>Traffic Signal System Preemption</td>
<td>Existing</td>
<td>This project would allow the deployment of traffic signal preemption for transit and emergency vehicles to reduce the travel time of the emergency and transit vehicles.</td>
</tr>
<tr>
<td>Municipalities</td>
<td>Public Safety Services</td>
<td>Existing</td>
<td>These services include fire fighters, police officers, and others who are dispatched to the incident site.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
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</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Winter Road Condition Hotline for Interstate Highways</td>
<td>Existing</td>
<td>A hotline phone service that disseminates seasonal statewide road conditions including road closures, detours, alternative routes, work zone/ construction events, and road surface conditions.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Roadway Weather Information System (RWIS)</td>
<td>Existing</td>
<td>Road Weather Information Systems collect weather information/images throughout the state. RWIS information is made available to the public and transportation agencies via a webpage.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>PennDOT Performance and Registration Information Systems Management (PRISM)</td>
<td>Existing</td>
<td>This project began as an effort to explore the potential of linking the Commercial Vehicle registration process to motor carrier safety.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>PennDOT Safety and Fitness Electronic Record (SAFER)</td>
<td>Planned 1</td>
<td>SAFER is a software program that enables the enforcement community to transmit and receive data on CVO safety, credential, and inspection to and from the roadside.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>PennDOT Statewide Transportation Management Center (STMC)</td>
<td>Existing</td>
<td>PennDOT intends to enhance existing Transportation Management Centers (TMC’s), and establish new TMC’s, to monitor and control the transportation system in partnership with other transportation operations providers.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>PennDOT “Wizard” Work Zone Alert Radio</td>
<td>Planned 1</td>
<td>The alert radio alerts truck drivers to work zone conditions.</td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Project</th>
<th>Status</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PennDOT (Central Office)</td>
<td>Statewide Telecommunication</td>
<td>Planned 1</td>
<td>This project would develop a statewide telecommunication system</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Construction Projects (current and future)</td>
<td>Existing</td>
<td>This project allows for road closure, work zone and construction information dissemination through PennDOT website.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Central Repository</td>
<td>Planned 2</td>
<td>This project would involve developing a central repository for information. The central repository information would include work zone information, real time traffic information, and accident information among others. The central repository will facilitate better coordination among various PennDOT offices and the customers.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Real-time Traffic Information Website</td>
<td>Planned 2</td>
<td>This project would include deployment of a real time traffic information website which would disseminate the following real time information: traffic information, incident information, work zone information and weather advisory information.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Statewide GIS based Incident Detour Map</td>
<td>Planned 1</td>
<td>This project would develop a statewide GIS based incident detour map for various major interstate routes. The statewide GIS based data would be consistent with the Counties’ GIS data.</td>
</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Video Sharing</td>
<td>Planned 2</td>
<td>This project would involve sharing of video images among various PennDOT Districts, PSP, PEMA, and other coordinating agencies.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
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</tr>
<tr>
<td>PennDOT (Central Office)</td>
<td>Web site Portal for Assisting Commercial Vehicle Operators</td>
<td>Planned 2</td>
<td>In addition to the real time traffic information, this website would assist the commercial vehicle operators by providing video images, incident alerts, customized incident information/alerts, site restrictions. This website would also assist the commercial vehicle operators by reducing paper work necessary for their operations.</td>
</tr>
<tr>
<td>PennDOT (District 2-0)</td>
<td>HAR Systems</td>
<td>Planned 1</td>
<td>HAR Systems include radio transmitters that are used to provide travel advisories to travelers. They can be deployed at key locations and junctions to close ITS equipment gaps on the Interstates in the District 2-0 Region.</td>
</tr>
<tr>
<td><strong>PennDOT (District 2-0)</strong></td>
<td>Inter-Agency Communications Protocols</td>
<td>Planned 1</td>
<td>Develop communications protocols for effective incident management in conjunction with TSOP 05. Processes, procedures, and relationships are needed to more effectively manage roadway incidents. Improve Inter-Agency communications will help decrease the time required to respond to and clear incidents, and to manage these processes safely and efficiently.</td>
</tr>
<tr>
<td><strong>PennDOT (District 2-0)</strong></td>
<td>Links between Operations Centers</td>
<td>Planned 1</td>
<td>High-speed data links should be established between the TMC, County 9-1-1 Centers, and the State Police. These links will allow the quick and efficient exchange of data including CCTV while enhancing incident coordination and provide opportunity for redundancy.</td>
</tr>
</tbody>
</table>

Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region
<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Project</th>
<th>Status</th>
<th>Project Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>**PennDOT (District 2-0)</td>
<td>Multi-agency Regional Traffic Management Center</td>
<td>Planned 1</td>
<td>Develop a Regional TMC in the State College area that is centrally located for Districts 2-0, 9-0, and 10-0 to coordinate all traffic incidents and data gathering systems.</td>
</tr>
<tr>
<td>PennDOT (District 2-0)</td>
<td>Regional Weather Service</td>
<td>Planned 1</td>
<td>Develop a contract with the National Weather Service to enhance dissemination of weather (including forecasts) to motorists.</td>
</tr>
<tr>
<td>**PennDOT (District 2-0)</td>
<td>Traffic Surveillance</td>
<td>Planned 1</td>
<td>Closed-Circuit Television (CCTV) Cameras are used to provide visual images of highway operations and conditions. These images can then be used to verify incidents, determine what type of emergency response or management strategy should be deployed or dispatched, monitor weather conditions, and to identify field equipment such as traffic signals and signs.</td>
</tr>
<tr>
<td>**PennDOT (District 2-0)</td>
<td>Technology Assisted Speed Enforcement</td>
<td>Planned 1</td>
<td>Develop technology assisted speed enforcement in conjunction with the PSP. This will improve roadway safety and prevent speeding throughout the Region.</td>
</tr>
<tr>
<td>**PennDOT (District 2-0)</td>
<td>Permanent DMS Systems</td>
<td>Planned 1</td>
<td>Permanent DMS systems include signs where messages can be changed in order to provide real-time travel information to travelers. Deploy DMS at strategic locations in the District 2-0 Region including Centre, Clearfield and Clinton Counties.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
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</tr>
<tr>
<td><strong>PennDOT (District 2-0)</strong></td>
<td>Ramp Closures Gates</td>
<td>Planned 1</td>
<td>Ramp Closure Gates allow for easy closure of freeway entrance ramps during planned incidents such as sporting events and unplanned incidents such as freeway emergencies.</td>
</tr>
<tr>
<td><strong>PennDOT (District 2-0)</strong></td>
<td>Weigh-in-Motion</td>
<td>Planned 1</td>
<td>A weigh-in-motion device is designed to capture and recore truck axle weights and gross vehicle weights as they drive over a sensor. District 2-0 plans to deploy one at Exit 120 on I-80.</td>
</tr>
<tr>
<td><strong>PennDOT (District 2-0)</strong></td>
<td>Truck Runaway System</td>
<td>Planned 1</td>
<td>The Truck Runaway System is needed before Exit 111 on I-80 (Clearfield &amp; Penfield) to improve safety and promote safety awareness. The Runaway Truck Warning System alerts truck drivers to their speed and if traveling too fast to slow down then the system warns them via flashing lights on an overhead warning sign. The warning sign alerts the driver to the runaway escape ramp 1 mile ahead.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>PennDOT D9 Traffic Management Center (TMC)</td>
<td>Existing</td>
<td>PennDOT D9 TMC operates certain ITS devices, operates state roadways, and coordinates incident response.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>PennDOT D9 Central System Software</td>
<td>Existing</td>
<td>The Central system software will allow the D9 TMC to control and manage all the D9 field devices from single central system software.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>HAR Systems</td>
<td>Existing</td>
<td>HAR systems include radio transmitters that are used to provide travel advisories to travelers.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Permanent DMS Systems</td>
<td>Existing and Planned 1</td>
<td>Permanent DMS systems include signs where messages can be changed in order to provide real-time travel information to travelers.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
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</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Portable DMS Systems</td>
<td>Existing and Planned 1</td>
<td>Portable DMS systems include signs where messages can be changed from a number of limited messages in order to provide real-time travel information to travelers. All the counties possess portable DMS for posting messages from a mobile laptop.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Detour Route Sharing</td>
<td>Planned 1</td>
<td>Integrate Detour Routes and the ongoing Evacuation Plans into the ongoing Southern Alleghenies Regional ITS TMC Operations Manual for distribution.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Evacuation Planning</td>
<td>Planned 1</td>
<td>Support regional and state emergency management agencies develop and update evacuation plans and procedures for the region.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>CCTV Systems</td>
<td>Existing and Planned 1</td>
<td>CCTV systems include either permanent or portable cameras in the field used for incident detection, verification, and response.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Communication Network</td>
<td>Existing and Planned 1</td>
<td>PennDOT D9 currently has Fiber Optics along its roadway network with the need to extend it along I-99 to Bedford.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Broadcast Video Feeds</td>
<td>Planned 1</td>
<td>Display PennDOT 9-0s video feeds on a state website with longer term possibility of providing higher quality video feeds directly to the media.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Roadway Weather Information System (RWIS)</td>
<td>Existing</td>
<td>The RWIS collects roadway weather information using environmental sensors.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>I-99 Project, Blair County</td>
<td>Existing</td>
<td>This project involves deployment of CCTV along I-99 from US Route 22 to 17th street and deployment of DMS from Duncansville overpass to 17th street and at Pinecroft.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
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</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Park-and-Ride Lots</td>
<td>Existing</td>
<td>The park-and-ride lot facilities facilitate traffic management by providing opportunities to ride share. They also provide a critical link in auto-to-bus transfer.</td>
</tr>
<tr>
<td>PennDOT (District 9-0)</td>
<td>Welcome Centers and Rest Areas</td>
<td>Existing</td>
<td>These places act as a travel guide to provide information on the surrounding area including attractions, boarding and lodging, and events occurring in the area. It also provides directional maps. These facilities also provide restrooms and refreshments facilities.</td>
</tr>
<tr>
<td>Pennsylvania Emergency Management Agency (PEMA)</td>
<td>PEMA Emergency Operation Center</td>
<td>Existing</td>
<td>Emergency Operation Center provides agency coordination for significant incidents, events, and emergencies throughout Pennsylvania. Also collects/distributes information from various agencies for a Daily Incident Report webpage.</td>
</tr>
<tr>
<td>Pennsylvania Emergency Management Agency (PEMA)</td>
<td>PEMA Truck</td>
<td>Existing</td>
<td>PEMA truck acts as a backup to the operations of the PEMA’s Emergency Operations Center. The mobility of the truck allows establishing an Emergency Operations Center at the incidence location in case of major incident.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
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</tr>
<tr>
<td><em>Pennsylvania Emergency Management Agency (PEMA)</em></td>
<td>Regional Agile Port Intermodal Distribution System (RAPID)</td>
<td>Existing</td>
<td>This system uses global positioning satellites to keep track of any military cargo or hazardous materials moving by ship, truck or rail.</td>
</tr>
<tr>
<td><em>Pennsylvania Office of Administration</em></td>
<td>Statewide Communication System</td>
<td>Existing</td>
<td>This project involves the deployment of a statewide 800 MHz wireless communication system for state agencies.</td>
</tr>
</tbody>
</table>
| *Pennsylvania Office of Homeland Security*       | Regional Counter Terrorism Task Force                                    | Existing| This program is a major effort to properly organize the most effective scheme for Regional Counter Terrorism Task Forces to respond to the growing threat of the use of Weapons of Mass Destruction (WMD).  
PennDOT would like to be involved in the Regional Counter Terrorism task force. |
<p>| <em>Pennsylvania State Police (PSP)</em>                | Incident Information Management System (IIMS)                           | Existing| The Incident Information Management System is a database used to provide PSP vehicles incident reporting and dispatching capabilities.                                                                              |
| <em>Pennsylvania State Police (PSP)</em>                | PSP Dispatch Centers                                                    | Existing| PSP Dispatch Centers are responsible for PSP operations. Dispatch Centers dispatch PSP Vehicles to incidents and emergencies on state highways.                                                                     |
| <em>Pennsylvania State Police (PSP)</em>                | PSP Consolidated Dispatch Center                                        | Planned 1| PSP Consolidated Dispatch Centers will provide consolidated dispatch and management of PSP resources for incident/emergency operations throughout the coverage area.                                               |</p>
<table>
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<tr>
<th>Stakeholder</th>
<th>Project</th>
<th>Status</th>
<th>Project Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Pennsylvania State Police (PSP)</strong></td>
<td>Mobile Data Terminals (MDT's)</td>
<td>Existing and Planned 1</td>
<td>In-vehicle systems used by the vehicles to communicate and receive dispatch information from PSP and other agencies’ systems. MDT’s are currently being integrated with other state agencies now (i.e. PEMA) and municipal agencies in the future.</td>
</tr>
<tr>
<td><strong>Pennsylvania State University (PSU)</strong></td>
<td>PSU Event Management Plan University</td>
<td>Planned 1</td>
<td>An Event Management Plan for Penn State University Area, will identify technologies that may serve the transportation system. This project includes major roadways that go through the State College Area and are traveled by visitors to the region.</td>
</tr>
<tr>
<td><strong>Regional Media</strong></td>
<td>Information Dissemination</td>
<td>Existing</td>
<td>This program allows the regional media outlets to disseminate the weather, traffic, and other information to the general public.</td>
</tr>
<tr>
<td><strong>Regional Transit Agencies</strong></td>
<td>CATA Automated Vehicle Location (AVL) System</td>
<td>Existing</td>
<td>Implement AVL system to effectively plan routes and fleet service functions. It is the building block of advanced transit technologies.</td>
</tr>
<tr>
<td><strong>Regional Transit Agencies</strong></td>
<td>Computer Aided Reservation, Scheduling, and Dispatch (CARSD)</td>
<td>Planned 1</td>
<td>Implement system for demand responsive transit services with the capability to manage multiple functions under one system. It will improve efficiency and reduce fleet operating costs.</td>
</tr>
<tr>
<td><strong>Regional Transit Agencies</strong></td>
<td>ATA Fleet Maintenance</td>
<td>Planned 1</td>
<td>Implement advanced fleet maintenance system to reduce operating and maintenance costs of the ATA fleet.</td>
</tr>
<tr>
<td>Stakeholder</td>
<td>Project</td>
<td>Status</td>
<td>Project Description</td>
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</tr>
<tr>
<td><strong>Regional Transit Agencies</strong></td>
<td>State College Multimodal Facility</td>
<td>Planned 1</td>
<td>Construct a new facility in State College to enhance transit service in the region by providing an multimodal connection for travelers and visitors. ITS systems such as kiosk and Bus Stop VMS would enhance such a facility.</td>
</tr>
<tr>
<td>Regional Transit Agencies</td>
<td>ATA Transit Traveler Information</td>
<td>Existing</td>
<td>Implement technologies to disseminate pre-trip travel planning information such as route and schedule information via Interactive Voice Responsive (IVR) Telephone and Internet CARSD.</td>
</tr>
<tr>
<td><strong>Regional Transit Agencies</strong></td>
<td>CATA Transit Traveler Information</td>
<td>Planned 1</td>
<td>Implement system to provide pretrip (routes and schedules) and enroute (next bus arrival times) traveler information through Kiosks, Internet, and Bus Stop VMS.</td>
</tr>
<tr>
<td><strong>Regional Transit Agencies</strong></td>
<td>Regional Fare Card</td>
<td>Planned 1</td>
<td>Implement region-wide Smart Card system to support transit fare payment and regional transit connections.</td>
</tr>
<tr>
<td>Towing Industry</td>
<td>Incident Response Program</td>
<td>Existing</td>
<td>This program allows for clearance of the wrecks after an incident/event.</td>
</tr>
<tr>
<td>Towing Industry</td>
<td>Communication Medium for Wreckers</td>
<td>Planned 2</td>
<td>This program would allow towing industry responders to establish communication with other emergency response agencies.</td>
</tr>
<tr>
<td>Towing Industry</td>
<td>Incident Information for Towing Industry Responders</td>
<td>Planned 2</td>
<td>This program would allow towing industry responders to respond efficiently to the incidents. The incident information that needs to be relayed to the towing industry responders would include the exact location of the incidents, nature of the incident, and the established code for the abandoned vehicle(s).</td>
</tr>
</tbody>
</table>

**Indicates updated projects developed out of the District 2-0 Regional Operations Plan (ROP) in August, 2007.**
3 Regional Systems Inventory, Needs, and Services

It is important to have a good working knowledge of the various ITS related elements that have already been deployed and are operational throughout the region. This ensures that project recommendations resulting from the architecture development process will not be redundant. In addition, it provides an opportunity for stakeholders to evaluate their level of ITS awareness, intent to implement ITS, and identify local and region-wide interests with the available technologies. The inventory of ITS elements serves as a baseline against which ITS needs and opportunities can be assessed.

Several resources were reviewed to identify existing and planned ITS-related elements in the region and some of these include: the FHWA Deployment Tracking Surveys; State TIP; Twelve Year Transportation Plan; previous ITS reports for neighboring regions; and the National ITS Architecture documents. Representatives from various agencies were consulted to discuss other ITS related projects that are planned for their jurisdiction but not yet documented.

It should be noted that even though some agencies did not participate in the architecture development process (primarily due to their lack of interest), representatives from other key agencies, with similar or allied functions and responsibilities, provided valuable information on behalf of their peer agencies.

Based on the analysis of survey responses, telephone interviews, review of several documents, and input from stakeholders at the workshops, the ITS inventory of the region is provided in Table 2.1.

3.1 Elements

Elements refer to organizational entities that operate in the transportation environment and are stakeholders in the effort. Elements also include planning agencies that are involved in the “business” of programming ITS into the mainstream project planning process. The elements in the District 2-0 Region are listed below:

- Advanced Traveler Information and Resource Center (ATIRC)
- Aero Medical Transport Services
- ATA Transit Operations Center
- ATA Transit Operations Center Kiosks
- ATA Transit Vehicles
- Automatic Permit, Routing, and Analysis System (APRAS)
- CATA Bus Operations Center
- CATA Bus Operations Center Kiosks
- CATA Transit Vehicles
- Centre County Paratransit Services Center
- Centre County Paratransit Vehicles
- DuFAST Transit Office
- DuFAST Transit Office Kiosks
- DuFAST Transit Vehicles
- I-99 Fiber Optic Network
- Incident Information Management System (IIMS)
- Local 911 Centers
- Local EMS Dispatch
- Local EMS Vehicles
- Local Fire Vehicles
- Local Police Crash Reporting System
- Local Police Vehicles
- Mapping, Addressing & Internet Mapping
- Mifflin-Juniata Area Agency on Aging Transit Center
- Mifflin-Juniata Area Agency on Aging Transit Vehicles
- Municipalities’ Traffic Signal Equipment
- Penn State University Field Sensors
- PennDOT 2-0 Field Equipment
- PennDOT 2-0 Oversize / Overweight Permitting
- PennDOT 2-0 Traffic Management Center
- PennDOT 2-0 Traffic Section Kiosks
- PennDOT 2-0 Web Page and Media
- PennDOT 9-0 Traffic Management Center
- PennDOT BOMO Traffic Control Center
- PennDOT Central Crash Information System and Analysis
- PennDOT Central Traffic Analysis Unit Center
- PennDOT Central Traffic Analysis Unit Field Equipment
- State College Borough Parking System
- Regional EMS Coordination
- HAZMAT Cleanup
- HAZMAT Cleanup Vehicles
- HAZMAT Mitigation / Containment
- Pennsylvania State Police Highway Dispatch
- Pennsylvania State Police Patrol Vehicles
- PSU Athletic Sports Information Office
- PSU Police Emergency Response Unit
- PSU Police Emergency Response Unit Vehicles
- Commercial Vehicle Fleet Information Systems
- County Planning Commission
- Local Fleet and Freight Management Systems
- Local School District Transportation Dispatch
- Regional Emergency Medical Services Coordination
- Regional Transportation Planning and Development Programs
- Transportation Research and Education Programs
- PSUTS Dynamic Message Signs
- PSUTS Fleet Operations
- PSUTS Fleet Transit Vehicles
- PSUTS Paratransit Vehicles
- PSUTS Parking Office and Events Coordinator
- PSUTS Parking Office ISP
- PSUTS Parking Office ISP Kiosks
- PSUTS Parking, Traffic, and Transit Management
- PSUTS Traffic Management Center
3.2 Systems Inventory

Using existing documentation, ITS systems in the Region — both existing and planned — were identified. The inventory is presented in tabular format by agency. The information presented here provides traceability from the systems projects initially entered into the Architecture. Because the Architecture is a “living” document, this section will need to be updated as time passes. Projects are grouped into three categories: Existing, Planned 1, and Planned 2. As noted previously, Planned 1 projects refer to efforts that are currently programmed or funded, whereas Planned 2 projects are neither funded nor programmed.
### Table 3-1: Regional Systems Inventory

<table>
<thead>
<tr>
<th>ITS Element</th>
<th>Stakeholder</th>
<th>Status</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Advanced Traveler Information and Resource Center (ATIRC)</td>
<td>PENNDOT Central-Bureau of Highway Safety &amp; Traffic Engineering (BHSTE)</td>
<td>Planned</td>
<td>This center will manage traveler information in regions that do not have traffic management centers (TMC). The center will coordinate the sharing of traffic information between TMCs for Incident Management and Construction Coordination.</td>
</tr>
<tr>
<td>2 Aero Medical Transport Services</td>
<td>Aero Medical Transport Services</td>
<td>Existing</td>
<td>Life Flight is a regional helicopter service designed to provide critically ill or injured patients rapid access to advanced life support care and rapid transportation to critical care facilities. The Life Flight Helicopters consist of American Eurocopter built BK-117 and Dauphin aircraft. Equipped to handle any medical emergency, each helicopter fixed mount equipment includes a volume ventilator, oxygen, and a suction unit. Portable equipment includes cardiac monitors, defibrillator, suction unit, cervical immobilization device, adult and pediatric MAST trousers, intravenous infusion pumps, external and internal cardiac pacemakers, transcutaneous pulse oximeters and a full range of advanced life support drugs. Transport isolettes, complete with a full range of equipment for acute stabilization and transport of the neonate are available. Life Flight bases are located at both the Geisinger Medical Center (Danville Campus) and University Park Airport. Some of the other air ambulance services in the region include Stat Medivac and Life Lion.</td>
</tr>
<tr>
<td>ITS Element</td>
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</tr>
<tr>
<td>3 ATA Transit Operations Centers</td>
<td>Area Transportation Authority of North Central PA</td>
<td>Existing</td>
<td>The ATA Transit Operation Centers are located in DuBois, Bradford, and Johnsonburg. The Johnsonburg center coordinates the activities of the other centers. These centers manage transit vehicle fleets in the North Central Pennsylvania region covering six (6) rural counties: Cameron, Clearfield, Elk, Jefferson, McKean, and Potter counties. It also provides operations, maintenance, customer information, planning, and management functions for transit property. ATA provides a variety of fixed routes, routes with deviation, as well as demand responsive routes known as 'Call-a-Bus' Service (C.A.B.)</td>
</tr>
</tbody>
</table>
| 4 ATA Transit Operations Center Traveler Information | Area Transportation Authority of North Central       | Planned | Kiosks are public informational displays supporting various levels of interaction and information access and systems that provide security in public areas. ATA has plans to implement a transit traveler information system to provide pre-trip travel planning information such as route and schedule information via:  
- Interactive Voice Responsive IVR Telephone  
- Internet CARSD                                                                                     |
<p>| 5 ATA Transit Vehicles                           | Area Transportation Authority of North Central PA     | Existing| ATA presently operates an estimated 87 transit vehicles, with 76 of those being demand responsive vehicles.                                                                                                                                               |
| 6 Automatic Permit, Routing, and Analysis System (APRAS) | PENNDOT Central-Motor Carrier Division               | Existing| This system is operated from PENNDOT Central's Motor Carrier Division located in Harrisburg. Activities include Motor Carrier Safety Program, Hazardous Materials/Truck Access, Enforcement, and Scale Maintenance &amp; Certification.                                                       |</p>
<table>
<thead>
<tr>
<th>ITS Element</th>
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<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 CATA Bus Operations Center</td>
<td>Centre Area Transportation Authority</td>
<td>Existing</td>
<td>The CATA Bus Operations Center is located in State College. This center manages transit vehicle fleets, provides operations, maintenance, customer information, planning, and management functions for transit property. CATA's main service is the 'CentreLine', which is a regional public bus transportation system between Downtown State College/PSU Campus and surrounding areas. CATA also provides special services, which include seasonal shuttles that operate during special events in the State College area. CATA also provides a demand responsive service known as 'Centre Ride' for senior citizens and people with disabilities.</td>
</tr>
<tr>
<td>8 CATA Bus Operations Center Kiosks Transit Traveler Information</td>
<td>Centre Area Transportation Authority</td>
<td>Planned</td>
<td>Kiosks are public informational displays supporting various levels of interaction and information access and systems that provide security in public areas. CATA plans to implement a transit traveler information system to provide pre-trip (routes and schedules) and en-route (next bus arrival times) traveler information through:  - Kiosks/displays  - Internet  - Bus stop DMS</td>
</tr>
<tr>
<td>9 CATA Transit Vehicles</td>
<td>Centre Area Transportation Authority</td>
<td>Existing</td>
<td>CATA presently operates 60 transit vehicles of which 56 are fixed route buses equipped with Electronic Registering Fare Boxes</td>
</tr>
<tr>
<td>10 Centre County Paratransit Services Center</td>
<td>Centre County Office of Transportation Services</td>
<td>Existing</td>
<td></td>
</tr>
<tr>
<td>11 Centre County Paratransit Vehicles</td>
<td>Centre County Office of Transportation Services</td>
<td>Existing</td>
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<tr>
<td>ITS Element</td>
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</tr>
<tr>
<td>12 Concierge Service Centers</td>
<td>Concierge Service Provider</td>
<td>Existing</td>
<td>These include private companies that provide construction, mapping, routing, detour information, alarm validation and verification services to clients. They can specialize in different niches, including CVO. Examples today are GM Onstar, Ford RESCUE, and AAA.</td>
</tr>
<tr>
<td>13 DuFAST Transit Office</td>
<td>DuFAST Transit Authority</td>
<td>Existing</td>
<td>The DuFAST Transit Office is located in Dubois. This center manages transit vehicle fleets, provides operations, maintenance, customer information, planning, and management functions for transit property. DuFAST Transit operates three (3) fixed routes in the City of DuBois, the Borough of Falls Creek, and Sandy Township.</td>
</tr>
<tr>
<td>14 DuFAST Transit Office Kiosks</td>
<td>DuFAST Transit Authority</td>
<td>Planned</td>
<td>Kiosks are public informational displays supporting various levels of interaction and information access and systems that provide security in public areas.</td>
</tr>
<tr>
<td>15 DuFAST Transit Vehicles</td>
<td>DuFAST Transit Authority</td>
<td>Existing</td>
<td>There are currently 5 transit vehicles in operation.</td>
</tr>
<tr>
<td>16 I-99 Fiber Optics Network</td>
<td>PENNDOT Engineering District 2-0</td>
<td>Existing and Planned</td>
<td>The I-99 Corridor has a fiber optic network installed along the corridor. This provides communications links for planned ITS devices such as CCTV Cameras, DMS, RWIS, etc. Fiber Optics cable has been installed along sections of the I-99 Corridor in Altoona, Blair County. There is a need to extend fiber along I-99 to Bedford.</td>
</tr>
<tr>
<td>ITS Element</td>
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</tr>
<tr>
<td>Incident Information Management System (IIMS)</td>
<td>Pennsylvania State Police</td>
<td>Existing</td>
<td>IIMS encompasses the application of the technology to all activities related to the collection and processing of any and all information and evidence related to an event, as well as activities related to conducting investigations necessary to solve a crime or help prevent further crimes from being committed</td>
</tr>
<tr>
<td>Local 911 Centers</td>
<td>County Emergency Communications Agencies</td>
<td>Existing</td>
<td>These represent all the 911 Centers responsible for emergency management services in each county across the region: Blair County, Cameron County, Clearfield County, Clinton County, Centre County, Elk County, Juniata County, Mifflin County, McKean County, Potter County. These centers operate in various degrees, supporting public safety including police and fire stations, search and rescue special detachments, and HAZMAT response teams. They support coordinated emergency response involving multiple agencies. They may also track and manage emergency vehicle fleets using automated vehicle location technology and two-way communications with the vehicle fleet.</td>
</tr>
<tr>
<td>Local EMS Dispatch</td>
<td>Local EMS Responders</td>
<td>Existing</td>
<td>This supports efficient dispatch of emergency vehicles across the region. It tracks emergency vehicles, dispatches these vehicles to an incident, and provides safe and efficient routes based on real-time traffic information. These include Ambulance companies and Search &amp; Rescue Teams.</td>
</tr>
<tr>
<td>ITS Element</td>
<td>Stakeholder</td>
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</tr>
<tr>
<td>20 Local EMS Vehicles</td>
<td>Local EMS Responders</td>
<td>Existing</td>
<td>These include all EMS vehicles including ambulances. Some of these emergency vehicles are equipped to support signal preemption through communications with the roadside equipment such as traffic signals.</td>
</tr>
<tr>
<td>21 Local Fire Vehicles</td>
<td>Local Fire Companies</td>
<td>Existing</td>
<td>These include all operational vehicles owned by local fire companies. Some of these emergency vehicles are equipped to support signal preemption through communications with the roadside equipment such as traffic signals.</td>
</tr>
<tr>
<td>22 Local Police Crash Reporting System</td>
<td>Local Police Departments</td>
<td>Existing</td>
<td>This represents the administrative support required for preparing and filing crash reports to state agencies.</td>
</tr>
<tr>
<td>23 Local Police Vehicles</td>
<td>Local Police Departments</td>
<td>Existing</td>
<td>These include all operational vehicles owned by local police departments.</td>
</tr>
<tr>
<td>24 Mapping, Addressing &amp; Internet Mapping</td>
<td>NCPRPDC</td>
<td>Existing</td>
<td>The mapping and addressing phase is complete. The digital maps provide an accurate picture of the area for transportation planning, emergency response and (future) Automatic Vehicle Location (AVL). North Central uses Geographic Information System (GIS) software from ESRI to create interactive digital mapping applications and printed maps to support Regional and County functions.</td>
</tr>
<tr>
<td>25 Mifflin-Juniata Area Agency on Aging Transit Center</td>
<td>Mifflin-Juniata Area Agency on Aging (MJAAA)</td>
<td>Existing</td>
<td>The MJAAA operates a shared-ride transportation program. This requires passengers to schedule their trips so that other passengers’ trips can be coordinated with theirs. This service is known as Call-A-Ride-Service (C-A-R-S). The transit office is located in Lewistown and its functions include managing transit vehicle fleets, providing operations, maintenance, customer</td>
</tr>
<tr>
<td>ITS Element</td>
<td>Stakeholder</td>
<td>Status</td>
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</tr>
<tr>
<td>Mifflin-Juniata Area Agency on Aging Transit Vehicles</td>
<td>Mifflin-Juniata Area Agency on Aging (MJAAA)</td>
<td>Existing</td>
<td>MJAAA presently operates 9 wheelchair vans, 15 passenger vans, and 8 minivans. These vehicles communicate with the center via two-way radio systems.</td>
</tr>
<tr>
<td>Municipalities' Traffic Signal Control System</td>
<td>Municipalities within across the region</td>
<td>Existing</td>
<td>These include traffic signal systems with centralized control.</td>
</tr>
<tr>
<td>Municipalities' Traffic Signal Equipment</td>
<td>Municipalities within across the region</td>
<td>Existing</td>
<td>These include traffic signal equipment with vehicle pre-emption capabilities.</td>
</tr>
<tr>
<td>Penn State University Field Sensors</td>
<td>Penn State University (PSU)</td>
<td>Planned</td>
<td>These are field sensors operated and maintained by PSU for research purposes.</td>
</tr>
<tr>
<td>PENNDOT 2-0 Field Equipment</td>
<td>PENNDOT Engineering District 2-0</td>
<td>Existing</td>
<td>These include RWIS Stations, HAR Systems, CCTV Cameras, Permanent &amp; Mobile DMS, Loop detectors, and other ITS devices that are currently deployed or planned on roadways in the region</td>
</tr>
<tr>
<td>PENNDOT 2-0 Oversize/Overweight Permitting</td>
<td>PENNDOT Engineering District 2-0/PENNDOT Central-Motor Carrier Division</td>
<td>Existing</td>
<td>This supports administrative functions connected with issuance of oversize/overweight permits to commercial vehicles.</td>
</tr>
<tr>
<td>PENNDOT 2-0 Traffic Management Center</td>
<td>PENNDOT Engineering District 2-0</td>
<td>Existing</td>
<td>This center is complete and located in the District 2-0 Office in Clearfield, PA. The center communicates with roadway/field equipment to monitor and manage traffic flow in District 2-0 region. It also communicates with other Traffic Management Centers to coordinate traffic information and control strategies in neighboring jurisdictions. It may also provide information to broadcast media in the future.</td>
</tr>
<tr>
<td>ITS Element</td>
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</tr>
<tr>
<td>PENNDOT 2-0 Traffic Section Traveler Information Kiosks</td>
<td>PENNDOT Engineering District 2-0</td>
<td>Planned</td>
<td>Kiosks are public informational displays supporting various levels of interaction and information access and systems, which provide security in public areas. These kiosks would be installed at rest stops and may provide weather information, construction &amp; traffic restrictions, and roadway conditions. PennDOT District 2-0 plans to coordinate with PennDOT Central Office to provide traveler and weather information via kiosks/displays.</td>
</tr>
<tr>
<td>PENNDOT 2-0 Web Page and Media</td>
<td>PENNDOT Engineering District 2-0</td>
<td>Existing</td>
<td>This is the web page that provides regular updates on traffic alerts for major roadway maintenance and construction activities across the region (<a href="http://www.PENNDOT2.com">http://www.PENNDOT2.com</a>).</td>
</tr>
<tr>
<td>PENNDOT 9-0 Traffic Management Center</td>
<td>PENNDOT Engineering District 9-0</td>
<td>Existing</td>
<td>This center communicates with roadway/field equipment to monitor and manage traffic flow in District 9-0 region. It also communicates with other Traffic Management Centers to coordinate traffic information and control strategies in neighboring jurisdictions. It may also provide information to broadcast media in the future.</td>
</tr>
<tr>
<td>PENNDOT BOMO Traffic Control Center</td>
<td>PENNDOT Central-Bureau of Maintenance and Operations (BOMO)</td>
<td>Existing</td>
<td>This center collects weather information and road closure information from local county maintenance offices.</td>
</tr>
<tr>
<td>PENNDOT Central Crash Information System and Analysis</td>
<td>PENNDOT Central-Bureau of Highway Safety &amp; Traffic Engineering (BHSTE)</td>
<td>Existing</td>
<td>This involves Crash Reporting, Crash Analysis, Fatality Analysis Reporting, and Crash Information Systems.</td>
</tr>
<tr>
<td>ITS Element</td>
<td>Stakeholder</td>
<td>Status</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>---------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PENNDOT Central Traffic Analysis Unit Center</td>
<td>PENNDOT-Bureau of Planning and Research (BPR)</td>
<td>Existing</td>
<td>This center has its own field equipment for measuring pavement characteristics and other information, which are archived or used in transportation administration, policy evaluation, safety, planning, performance monitoring, program assessment, operations, and research applications. This center provides Highway Performance Monitoring System data, traffic data, etc.</td>
</tr>
<tr>
<td>PENNDOT Central Traffic Analysis Unit Field Equipment</td>
<td>PENNDOT-Bureau of Planning and Research (BPR)</td>
<td>Existing</td>
<td>These roadway devices (loop detectors) collect traffic information.</td>
</tr>
<tr>
<td>State College Borough Parking System</td>
<td>State College Borough</td>
<td>Existing</td>
<td>Includes on and off street parking facilities’ maintenance and operation.</td>
</tr>
<tr>
<td>Regional EMS Coordination</td>
<td>Regional EMS Councils: Seven Mountains &amp; EMMCO East, Inc.</td>
<td>Existing</td>
<td>They do not have their own fleets. 911 centers do the dispatching. They collect operational data from the 911 centers and analyze it for planning purposes.</td>
</tr>
<tr>
<td>HAZMAT Cleanup</td>
<td>HAZMAT Response Teams</td>
<td>Existing</td>
<td>Private Operators that do the cleanup. (Fire departments are the first responders.)</td>
</tr>
<tr>
<td>HAZMAT Cleanup Vehicles</td>
<td>HAZMAT Response Teams</td>
<td>Existing</td>
<td>Special Vehicles used in HAZMAT Cleanup operations.</td>
</tr>
<tr>
<td>HAZMAT Mitigation/Containment</td>
<td>Local HAZMAT Mitigation Companies</td>
<td>Existing</td>
<td>First Responders at HAZMAT incidents who evaluate the scene before the arrival of the HAZMAT Cleanup teams.</td>
</tr>
<tr>
<td>Pennsylvania State Police Highway Dispatch</td>
<td>Pennsylvania State Police</td>
<td>Existing</td>
<td>This supports the dispatch of patrol vehicles. It tracks and manages patrol vehicle fleets. It tracks the patrol vehicles, dispatches these vehicles to incidents, and provides safe and efficient routes based on real-time traffic information.</td>
</tr>
<tr>
<td>Pennsylvania State Police Patrol Vehicles</td>
<td>Pennsylvania State Police</td>
<td>Existing</td>
<td>These include all operational vehicles owned by the Pennsylvania State Police.</td>
</tr>
<tr>
<td>ITS Element</td>
<td>Stakeholder</td>
<td>Status</td>
<td>Notes</td>
</tr>
<tr>
<td>----------------------------------------------------</td>
<td>-------------------------------------------</td>
<td>---------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>PSU Athletic Sports Information Office</td>
<td>Penn State University Athletics</td>
<td>Existing</td>
<td>Performs the role of information service provider for major sporting events at Penn State University, State College.</td>
</tr>
<tr>
<td>PSU Police Emergency Response Unit</td>
<td>Penn State University Police</td>
<td>Existing</td>
<td>This supports the dispatch of PSU Police patrol vehicles. It tracks and manages patrol vehicle fleets. It tracks the patrol vehicles, dispatches these vehicles to incidents, and provides safe and efficient routes based on real-time traffic information.</td>
</tr>
<tr>
<td>PSU Police Emergency Response Unit Vehicles</td>
<td>Penn State University</td>
<td>Existing</td>
<td>These include all operational vehicles owned by the PSU Police.</td>
</tr>
<tr>
<td>Commercial Vehicle Fleet Information Systems</td>
<td>Local Fleet and Freight Management</td>
<td>Planned</td>
<td>These systems collect, processes, store, and disseminate transportation information to commercial vehicle system operators and the general traveling public.</td>
</tr>
<tr>
<td>County Planning Commission</td>
<td>Local County Planning Commissions</td>
<td>Existing</td>
<td>These agencies collect, archive, manage, and distribute data generated from ITS/transportation sources for use in transportation administration, policy evaluation, safety, planning, performance monitoring, program assessment, operations, and research applications.</td>
</tr>
<tr>
<td>Local Fleet and Freight Management Systems</td>
<td>Local Fleet and Freight Management</td>
<td>Existing</td>
<td>The Fleet and Freight Management Systems provide the capability for commercial drivers and dispatchers to receive real-time routing information and access databases containing vehicle and cargo locations as well as carrier, vehicle, cargo, and driver information. This is a private sector operation.</td>
</tr>
<tr>
<td>Local School District Transportation Dispatch</td>
<td>Local School Districts</td>
<td>Existing</td>
<td>This supports dispatch of school buses across the region. It tracks vehicles, dispatches these vehicles, and may provide safe and efficient routes based on real-time traffic information. This may also support emergency evacuation.</td>
</tr>
<tr>
<td>ITS Element</td>
<td>Stakeholder</td>
<td>Status</td>
<td>Notes</td>
</tr>
<tr>
<td>-------------</td>
<td>-------------</td>
<td>--------</td>
<td>-------</td>
</tr>
<tr>
<td>Regional Emergency Medical Services Coordination</td>
<td>Regional EMS Councils</td>
<td>Existing</td>
<td>Emergency Medical Service providers do not have their own fleets. 911 centers do the dispatching. They collect operational data from the Local 911 Centers and analyze it for planning purposes.</td>
</tr>
<tr>
<td>Regional Transportation Planning and Development Programs</td>
<td>Regional MPOs and LDDs</td>
<td>Existing</td>
<td>These include the coordination of all transportation planning and development activities by agencies such as NCPRPDC, Centre Region MPO, and SEDA Council of Governments, in partnership with PENNDOT. These agencies collect, archive, manage, and distribute data generated from ITS/transportation sources for use in transportation administration, policy evaluation, safety, planning, performance monitoring, program assessment, operations, and research applications.</td>
</tr>
<tr>
<td>Transportation Research and Education Programs</td>
<td>Penn State University</td>
<td>Existing</td>
<td>These include CITrans and PTI transportation research activities. They have their own field equipment for measuring pavement characteristics and other information that are archived or used in transportation administration, policy evaluation, safety, planning, performance monitoring, program assessment, operations, and research applications.</td>
</tr>
<tr>
<td>PSUTS Dynamic Message Signs</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>These include five (5) Portable DMS operated in conjunction with PENNDOT 2-0’s Clearfield office during special events that generate considerable traffic volume in the State College area.</td>
</tr>
<tr>
<td>PSUTS Fleet Operations</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>This element manages transit vehicle fleets, provides operations, maintenance, customer information, planning, and management</td>
</tr>
<tr>
<td>ITS Element</td>
<td>Stakeholder</td>
<td>Status</td>
<td>Notes</td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>--------------------------------------------------</td>
<td>------------</td>
<td>-----------------------------------------------------------------------</td>
</tr>
<tr>
<td>59 PSUTS Fleet Transit Vehicles</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>These include all transit vehicles operated by Penn State Transportation Services.</td>
</tr>
<tr>
<td>60 PSUTS Paratransit Vehicles</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>These include all paratransit vehicles operated by Penn State Transportation Services.</td>
</tr>
<tr>
<td>61 PSUTS Parking Office and Events Coordinator</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>This represents coordination activities during special events such as football games at Penn State University Stadium.</td>
</tr>
<tr>
<td>62 PSUTS Parking Office ISP</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>Provides Parking Information during special events hosted by Penn State.</td>
</tr>
<tr>
<td>63 PSUTS Parking Office ISP Kiosks</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>These are public informational displays supporting various levels of parking information.</td>
</tr>
<tr>
<td>64 PSUTS Parking, Traffic, and Transit Management</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>Serves as the coordination center for PSU’s transportation services.</td>
</tr>
<tr>
<td>65 PSUTS Traffic Management Center</td>
<td>Penn State University Transportation Services (PSUTS)</td>
<td>Existing</td>
<td>Serves as a remote traffic management center during special events in the State College area.</td>
</tr>
<tr>
<td>66 User Personal Devices</td>
<td>Travelers/Local Residents</td>
<td>Existing</td>
<td>These include personal computers (PC) and other personal information access (PIAs) devices.</td>
</tr>
</tbody>
</table>
3.3 Needs

This section summarizes the need identification process that resulted from the various stakeholder outreach activities (presentations, workshops, surveys). These needs will be evaluated against the existing and planned ITS projects to identify what ITS technology meet or will meet these needs. Ultimately, the prioritized needs will be matched with User Services and Market Packages in the National ITS Architecture, and used as the basis for the development of the regional ITS architecture, future planning efforts, project selection, and future implementation of ITS across the region.

Surveys

The responses from the surveys provided invaluable input in identifying local and regional transportation needs.

The primary stakeholder surveys were designed to obtain ITS inventory and relevant data from key stakeholder groups across the region. These groups include Public Transportation Agencies, Transit Providers, Emergency Management Service Providers, Municipalities, Commercial Vehicle Operators, and Traveler Information Service Providers.

The General Survey was intended primarily for stakeholders, though not directly involved in transportation operations, but still play vital roles in planning, providing supporting functions, and coordinating transportation services across the region. These stakeholders include MPOs, LDDs, Transportation Research Agencies/Academia, County Planning Commissions, Visitors’ Bureaus, and Economic Development Organizations. Nonetheless, some of the key stakeholders with direct involvement in transportation operations received and responded to the General Stakeholders Survey. The General Survey provided stakeholders the opportunity to express their opinion on major local transportation problems as it affects their agencies. The needs identified in the responses are listed in Table 3-2.

Overall, the survey response was satisfactory considering the general level of ITS awareness in the region as well as ITS being a relatively new concept. The survey responses also provided valuable discussion material at the focus group workshops.
### Table 3-2: Regional Needs Table

<table>
<thead>
<tr>
<th>Identified Needs</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Accident prone intersections and curves</td>
</tr>
<tr>
<td>2 Accidents on roadways</td>
</tr>
<tr>
<td>3 Air Quality</td>
</tr>
<tr>
<td>4 Amount of Liquid fuel reimbursement</td>
</tr>
<tr>
<td>5 Availability-Harrisburg International Airport</td>
</tr>
<tr>
<td>6 Congestion</td>
</tr>
<tr>
<td>7 Consider systems rather than &quot;points&quot;</td>
</tr>
<tr>
<td>8 Construction</td>
</tr>
<tr>
<td>9 Construction funds for access roads</td>
</tr>
<tr>
<td>10 Control speeding during incidents and inclement weather.</td>
</tr>
<tr>
<td>11 Cost of fuel</td>
</tr>
<tr>
<td>12 Deficiencies in roadway designs and routing</td>
</tr>
<tr>
<td>13 Elderly Drivers</td>
</tr>
<tr>
<td>14 Expand Route 219 to 4-lane limited access highway to Route 80</td>
</tr>
<tr>
<td>15 Funding for maintenance of infrastructure/control</td>
</tr>
<tr>
<td>16 General resurfacing (Local level)</td>
</tr>
<tr>
<td>17 Growing degradation of the environment</td>
</tr>
<tr>
<td>18 Increase inter-agency cooperation</td>
</tr>
<tr>
<td>19 Increased and uncoordinated development</td>
</tr>
<tr>
<td>20 Intermodal/multi-modal connections</td>
</tr>
<tr>
<td>21 Improve inter-agency communications.</td>
</tr>
<tr>
<td>22 Lack of paving of shoulder for bikes/pedestrian traffic</td>
</tr>
<tr>
<td>23 Lack of planning funds</td>
</tr>
<tr>
<td>24 Lack of Public Transportation county-wide</td>
</tr>
<tr>
<td>25 Lack of rail freight funds</td>
</tr>
<tr>
<td>26 Local (township, etc) bridges in need of replacement/repair</td>
</tr>
</tbody>
</table>
The regional transportation needs were ranked, prioritized and extensively reviewed to identify those needs that could be addressed by ITS solutions. These needs were categorized as ITS Needs. The other transportation needs would be addressed through other transportation projects or efforts.

The prioritized ITS Needs were reviewed, particularly for commonalities, and grouped together in developing a set of Regional ITS Objectives. The objectives and the corresponding ITS needs are listed in Table 3.3.

The needs were categorized into four (4) groups based on their relative importance as indicated by the ranking scores. The four groups are defined as follows:
• Highest Priority ===> Need will be addressed in the Short-Term
• Medium Priority ===> Need will be addressed in the Medium-Term
• Lowest Priority ===> Need will be addressed in the Long-Term
• Non-Priority ===> Need will not be addressed by this program

From the various stakeholder outreach activities (interviews, surveys, meetings, workshops) as well as an extensive review of the transportation system across the region, the ITS vision for the Regional ITS Architecture Development Program is defined as follows:

**A coherent ITS plan that would facilitate the deployment of cost effective technologies and strategies, resulting in easily identifiable improvements and benefits in the region’s transportation system.**

<table>
<thead>
<tr>
<th>1</th>
<th>Improve incident management strategies and reduce incident clearance and incident response times</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs ID# (4)</td>
<td>Incident management strategies at the scene of incidents</td>
</tr>
<tr>
<td>Needs ID# (5)</td>
<td>Coordinated Incident responses</td>
</tr>
<tr>
<td>Needs ID# (7)</td>
<td>Incident Clearance times</td>
</tr>
<tr>
<td>Needs ID# (8)</td>
<td>Incident response times</td>
</tr>
<tr>
<td>Needs ID# (14)</td>
<td>Incident detection</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Reduce congestion caused by accidents, roadway maintenance/construction, and special events through enhanced traffic management capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs ID# (1)</td>
<td>Congestion due to accidents</td>
</tr>
<tr>
<td>Needs ID# (10)</td>
<td>Congestion due to construction/maintenance operations</td>
</tr>
<tr>
<td>Needs ID# (13)</td>
<td>Congestion due to special events</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>3</th>
<th>Improve crash prevention measures and ensure the implementation of safety procedures on roadways</th>
</tr>
</thead>
<tbody>
<tr>
<td>Needs ID# (2)</td>
<td>Safety on roadways</td>
</tr>
<tr>
<td>Needs ID# (3)</td>
<td>Accidents on roadways</td>
</tr>
</tbody>
</table>

<p>| 4 | Improve and develop new strategies to encourage inter-agency/intra-agency cooperation and facilitate transportation data sharing |</p>
<table>
<thead>
<tr>
<th>Needs ID#</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>(6)</td>
<td>Increase inter-agency cooperation</td>
</tr>
<tr>
<td>(23)</td>
<td>Transportation Data Sharing</td>
</tr>
<tr>
<td>5</td>
<td>Adopt innovative strategies to improve maintenance and construction operations</td>
</tr>
<tr>
<td>(15)</td>
<td>Road Maintenance Operations</td>
</tr>
<tr>
<td>6</td>
<td>Provide accurate real-time traveler information to the public</td>
</tr>
<tr>
<td>(9)</td>
<td>Lack of traffic condition information</td>
</tr>
<tr>
<td>7</td>
<td>Provide accurate roadway weather and pavement condition information to travelers and roadway maintenance personnel</td>
</tr>
<tr>
<td>(15)</td>
<td>Road Maintenance Operations</td>
</tr>
<tr>
<td>(19)</td>
<td>Lack of roadway weather/pavement condition information</td>
</tr>
<tr>
<td>8</td>
<td>Provide region-wide traveler/tourist information service with particular emphasis on roadways that provide access to State Parks and other major tourist areas</td>
</tr>
<tr>
<td>(24)</td>
<td>Traveler services/Tourist Information</td>
</tr>
<tr>
<td>9</td>
<td>Improve and coordinate traffic signal systems across the region</td>
</tr>
<tr>
<td>(20)</td>
<td>Need to upgrade Traffic Signals in municipalities</td>
</tr>
<tr>
<td>10</td>
<td>Improve public transit services across the region</td>
</tr>
<tr>
<td>(34)</td>
<td>Schedule and Route Information</td>
</tr>
<tr>
<td>(35)</td>
<td>Travel times for transit journeys</td>
</tr>
<tr>
<td>(36)</td>
<td>Intermodal/multi-modal connections</td>
</tr>
<tr>
<td>(37)</td>
<td>Need to expand Public Transit Services</td>
</tr>
<tr>
<td>11</td>
<td>Establish a framework to facilitate ITS education, research, and marketing efforts to the public</td>
</tr>
<tr>
<td>(26)</td>
<td>Take advantage of educational/research opportunities in the area of transportation (at PSU)</td>
</tr>
</tbody>
</table>
The user services were prioritized and are listed below:

**Highest Priority**
- Incident Management
- Traffic Control
- Emergency Vehicle Management
- Archived Data Function
- Pre-Trip Travel Information
- En-Route Driver Information

**Medium Priority**
- Traveler Services Information
- Emergency Notification and Personal Security
- Travel Demand Management
- Public Transportation Management
- Automated Roadside Safety Inspection
- Public Travel Security
- Electronic Payment Services
- En-Route Transit Information

**Lowest Priority**
- Ride Matching and Reservation
- Highway-Rail Intersection
- Route Guidance
- Personalized Public Transit
- Hazardous Material Incident Response
- Commercial Vehicle Electronic Clearance

**Non-Priority**
- Safety Readiness
- Emissions Testing and Mitigation
- On-board Safety Monitoring
- Vision Enhancement for Crash Avoidance
- Commercial Vehicle Administrative Process
- Commercial Fleet Management
- Intersection Collision Avoidance
- Pre-Crash Restraint Deployment
- Longitudinal Collision Avoidance
- Lateral Collision Avoidance
- Automated Vehicle Operation
3.4 Services

“Services” refer to the information outputs from one agency operation to another; they are presented in tabular format and trace back to the systems inventory. Table 3-4 summarizes the relationship between the identified objectives and the user services.

<table>
<thead>
<tr>
<th>Regional ITS Objective</th>
<th>User Service ID#</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Improve incident management strategies and reduce incident clearance and incident</td>
<td>(7), (22), (23)</td>
</tr>
<tr>
<td>response times</td>
<td></td>
</tr>
<tr>
<td>2 Reduce congestion caused by accidents, roadway maintenance/construction, and special</td>
<td>(6), (1), (2)</td>
</tr>
<tr>
<td>events through enhanced traffic management capabilities</td>
<td></td>
</tr>
<tr>
<td>3 Improve crash prevention measures and ensure the implementation of safety procedures</td>
<td>(6), (10), (17), (20)</td>
</tr>
<tr>
<td>on roadways</td>
<td></td>
</tr>
<tr>
<td>4 Improve and develop new strategies to encourage inter-agency/intra-agency cooperation</td>
<td>(31)</td>
</tr>
<tr>
<td>and facilitate transportation data sharing</td>
<td></td>
</tr>
<tr>
<td>5 Adopt innovative strategies to improve maintenance and construction operations</td>
<td>None</td>
</tr>
<tr>
<td>6 Provide accurate real-time traveler information to the public</td>
<td>(1), (2)</td>
</tr>
<tr>
<td>7 Provide accurate roadway weather and pavement condition information to travelers</td>
<td>(1), (2)</td>
</tr>
<tr>
<td>and roadway maintenance personnel</td>
<td></td>
</tr>
<tr>
<td>8 Provide region-wide traveler/tourist information service with particular emphasis</td>
<td>(5)</td>
</tr>
<tr>
<td>on roadways that provide access to State Parks and other major tourist areas</td>
<td></td>
</tr>
<tr>
<td>9 Improve and coordinate traffic signal systems across the region</td>
<td>(6)</td>
</tr>
<tr>
<td>10 Improve public transit services across the region</td>
<td>(4), (8), (11), (12), (13),</td>
</tr>
<tr>
<td></td>
<td>(14), (15)</td>
</tr>
<tr>
<td>11 Establish a framework to facilitate ITS education, research, and marketing efforts</td>
<td>None</td>
</tr>
<tr>
<td>to the public</td>
<td></td>
</tr>
</tbody>
</table>
4 Regional ITS Architecture

The Regional ITS Architecture was created using the process discussed in Section 1.1 ‘Architecture Process’ on this document. The development of the Regional ITS Architecture consisted of: (1) developing a Strawman document using the RAP as a source of information gathering, (2) outreaching to ITS stakeholders in the Region and validating the Strawman, and (3) revising the Architecture to reflect stakeholder inputs from the outreach process. This process is further discussed below.

Strawman

Using existing documentation and information gathered from the RAP (Section 3 tables) a Strawman, or draft, Regional ITS Architecture was developed. The RAP consisted of key stakeholders in the Region and was used to gather preliminary information for Architecture development. This information was then used to assign actual and potential “interconnects” and “information flows” between among the ITS elements. The result of this effort was a draft version of this Final Report, known as the Strawman Architecture. The updated Strawman Architecture document was created and submitted to PennDOT in July 2007.

Outreach

Public Sector Course

The Public Sector Course was held on January 24 and 25, 2001 at the Penn State Conference Center Hotel, State College, PA. This course was designed to present the National ITS Architecture as a set of tools with a particular emphasis on the application of the architecture to the development of regional architectures for ITS planning and the definition of integrated projects. The target audience for this course included: traffic engineers, transportation planners, transit planners, transit operators, emergency service providers, commercial vehicle operators, and other transportation-related professionals who are involved in planning, designing or implementing ITS-related projects.

Workshops

The Tier I Workshop was held on February 28, 2001 in State, State College, PA. PENNDOT District 2-0 and FHWA organized this workshop in conjunction with Orth-Rodgers & Associates, Inc. (ORA). The workshop was a one-day gathering of local transportation professionals and non-transportation stakeholders, to introduce participants to the basic steps and concepts necessary for developing PENNDOT District 2-0's ITS Architecture. This workshop was the official start of the architecture development process: the big kickoff.

The Tier II Workshop was held on July 17-July 19, 2001 in State College, PA. PENNDOT District 2-0 and FHWA-Harrisburg organized this workshop in conjunction with ORA.
The Tier II Workshop is a three-day event aimed at providing technical assistance to the region’s transportation professionals and non-transportation stakeholders in developing a draft version of the Regional ITS Architecture. The workshop provided a forum for stakeholders to convene, review the inventory of ITS elements, identify opportunities for regional integration, educate stakeholders on the architecture development process, and identify key Post-Tier II Workshop activities that are necessary for the success of the architecture development program.

Surveys and Interviews

Following the Tier I Workshop, surveys were sent to key stakeholders to collect ITS Inventory information. The surveys were categorized into the following functional areas of transportation operations:

- Freeway/Arterial Management
- Traffic Signal Control Systems
- Transit Management and Electronic Fare Payment
- Emergency Management Services
- Incident Management
- Highway-Rail Intersections
- Regional Traveler and Tourist Information
- General Stakeholders Survey

Follow-up interviews were conducted to complement the information obtained from the survey responses. A printable format of the surveys can be obtained from the project web site at www.penndot2its.org. On-line surveys are also available on the project web site.

Final Architecture

This report, Final Regional ITS Architecture, was developed based on comments received from stakeholders during the outreach process. Stakeholder comments from the outreach process were reconciled and incorporated into the Strawman document, resulting in the Final Architecture. The following sections depict the final ITS Architecture diagrams. These diagrams include:

- Subsystem Interconnect Diagrams,
- Interconnect Diagrams, and
- Information Flow Diagrams.

Regional Operations Plan (ROP)

Jacobs Edwards and Kelcey completed the District 2-0 Regional Operations Plan (ROP) in 2007 which followed an outlined process which was based on the development of the District 2-0 Regional ITS Architecture and Transportation Systems Operation Plan (TSOP). The ROP process included two (2) workshop meetings and two (2) task force meetings to address the ITS and Operation needs of Stakeholders in the Region. The projects and needs identified in the 2004 District 2-0 Architecture were used as the basis for identifying project needs for the region. The Regional ITS projects were updated in
this re-formatted version of the District 2-0 ITS Architecture to reflect the current needs identified during the ROP process. The status of several projects in the Architecture remain as “planned” projects for the District 2-0 region based on existing needs. The Regional ITS Architecture for District 2-0 will be updated to reflect future updates of the ROP.

4.1 Subsystem Interconnect Diagram

This diagram presents the Regional ITS Architecture relationships between subsystems and the communication between them. As shown this diagram provides a visual representation of data used in the development of the Regional ITS Architecture. Subsystems that do not pertain this particular Regional ITS Architecture are denoted in a light grey text. The Subsystem Interconnect Diagram is divided into four system classes; Travelers, Centers, Vehicles, and Roadside. A color scheme (green, yellow, blue, and red) links subsystems and elements back to the System Interconnect Diagram.
Figure 4-1: Subsystem Interconnect Diagram
4.2 Regional Subsystem Interconnect Diagram showing Elements

This diagram presents the regional ITS Architecture relationships between subsystems, the communication between them, and the elements within each subsystem. As shown this diagram provides a visual representation of data used in the development of the Regional ITS Architecture. In this diagram elements have been added to make this diagram useful for regional specificity. This information is also provided in a tabular format listed by element.
Figure 4-2: Regional Subsystem Interconnect Diagram showing Elements
### Table 4-1: Regional Subsystems/Terminators

<table>
<thead>
<tr>
<th>Element</th>
<th>Subsystem/Terminator mapped to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>911 Communication Centers</td>
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<td>Commercial Vehicle Company Offices</td>
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<td>Incident Response Agency Offices</td>
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</tr>
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<td>MDSP Offices</td>
<td>Emergency Management</td>
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<td>MEMA Emergency Operation Center</td>
<td>Emergency Management</td>
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<td>Municipal Field Devices</td>
<td>Roadway</td>
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<td>Municipal Traffic Management Offices</td>
<td>Traffic Management</td>
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<tr>
<td>Municipal/Regional Public Safety Offices</td>
<td>Emergency Management</td>
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<td>Municipal/Regional Public Safety Vehicles</td>
<td>Emergency Vehicle</td>
</tr>
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<td>Passenger Vehicles</td>
<td>Vehicle</td>
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<td>PEMA Emergency Operation Center</td>
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<td>Information Service Provider</td>
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</tr>
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<td>Commercial Vehicle Check</td>
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<tr>
<td>Element</td>
<td>Subsystem/Terminator mapped to:</td>
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<td>-----------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------</td>
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<td>PennDOT Central Office Organizations</td>
<td>Archived Data Management, Commercial Vehicle Administration, Emergency Management, Information Service Provider, Maintenance and Construction Management, Traffic Management</td>
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<td>Archived Data Management, Emergency Management, Maintenance and Construction Management, Traffic Management</td>
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<td>PennDOT D8 TMC</td>
<td>Archived Data Management, Emergency Management, Maintenance and Construction Management, Traffic Management</td>
</tr>
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<td>Maintenance and Construction Management, Traffic Management</td>
</tr>
<tr>
<td>PennDOT D9 Field Devices</td>
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</tr>
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<td>PennDOT D9 Maintenance and Construction Vehicles</td>
<td>Maintenance and Construction Vehicle</td>
</tr>
<tr>
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<tr>
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<td>Archived Data Management, Commercial Vehicle Administration, Emergency Management, Information Service Provider, Maintenance and Construction Management, Traffic Management</td>
</tr>
<tr>
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</tr>
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<td>Personal Traveler Information Devices</td>
<td>Personal Information Access</td>
</tr>
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<td>PSP Offices</td>
<td>Archived Data Management, Commercial Vehicle Administration</td>
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</table>
### 4.3 Interconnect Matrix

This section documents the actual and potential “interconnects” (i.e., interfaces) among the ITS elements. Interconnects show where one operation will connect data or information with another operation. The section is primarily documented as Turbo software output.

<table>
<thead>
<tr>
<th>Element</th>
<th>Subsystem/Terminator mapped to:</th>
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</thead>
<tbody>
<tr>
<td>PSP Troop T Highspire</td>
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</tr>
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<td>PSP Troop T Vehicles</td>
<td>Emergency Vehicle</td>
</tr>
<tr>
<td>PSP Vehicles</td>
<td>Emergency Vehicle</td>
</tr>
<tr>
<td>PTC Field Devices</td>
<td>Commercial Vehicle Check, Emergency Telecommunications System, Roadway</td>
</tr>
<tr>
<td>PTC Maintenance and Construction Vehicles</td>
<td>Maintenance and Construction Vehicle</td>
</tr>
<tr>
<td>PTC Offices</td>
<td>Archived Data Management, Commercial Vehicle Administration, Emergency Management, Information Service Provider, Maintenance and Construction Management, Toll Administration, Traffic Management</td>
</tr>
<tr>
<td>PTC Service Plazas</td>
<td>Remote Traveler Support</td>
</tr>
<tr>
<td>PTC Toll Plazas</td>
<td>Commercial Vehicle Check, Toll Collection</td>
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<tr>
<td>Regional Media Outlets</td>
<td>Media</td>
</tr>
<tr>
<td>Regional Transit Agency Offices</td>
<td>Archived Data Management, Information Service Provider, Transit Management</td>
</tr>
<tr>
<td>Regional Transit Remote Traveler Support</td>
<td>Remote Traveler Support</td>
</tr>
<tr>
<td>Regional Transit Vehicles</td>
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<tr>
<td>Towing Industry Responders</td>
<td>Emergency Vehicle</td>
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<tr>
<td>TRANSCOM Center</td>
<td>Information Service Provider</td>
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<tr>
<td>Weather Information Providers</td>
<td>Weather Service</td>
</tr>
</tbody>
</table>
1 Communication Centers
djacent PennDOT District and County Offices
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ennDOT D8 TMC
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Municipal/Regional Public Safety Offices
Municipal/Regional Public Safety Vehicles

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Regional Transit Vehicles

Regional Transit Remote Traveler Support

PTC Toll Plazas

PTC Service Plazas

PTC Offices

PTC Maintenance and Construction Vehicles

PTC Field Devices

PSP Vehicles

PSP Troop T Vehicles

TRANSCOM Center

X

Towing Industry Responders

X

Regional Transit Agency Offices

X

Regional Media Outlets

X

PSP Troop T Highspire

X
X
X
X

PSP Offices

Personal Traveler Information Devices

Pennsylvania Office of Homeland Security

PennDOT Welcome Centers and Rest Areas

PennDOT STMC

PennDOT D9 TMC

PennDOT D9 Maintenance and Construction Vehicles

PennDOT D9 Field Devices

PennDOT D9 County Maintenance Offices

PennDOT D8 TMC

PennDOT D2 TMC

PennDOT Central Office Organizations

PennDOT Central Office Field Devices

PEMA Emergency Operation Center

Passenger Vehicles

Municipal Field Devices

MEMA Emergency Operation Center

MDSP Offices

MDSHA Offices

County/Regional Planning Organizations

Incident Response Agency Offices

X

High Threat Facilities

County EMA Centers

Commercial Vehicles

Commercial Vehicle Company Offices

Blair County 911 Communication Center

Attractions and Event Promoters

Adjacent PennDOT District and County Offices

911 Communication Centers

Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Table 4-2: Regional Interconnect Matrix

X

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<td>Adjacent PennDOT District and County Offices</td>
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<td>Personal Traveler Information Providers</td>
<td>Personal Traveler Information Providers</td>
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<td>Regional Transit Agency Offices</td>
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<td>Regional Transit Remote Traveler Support</td>
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<td>Regional Transit Vehicles</td>
<td>Regional Transit Vehicles</td>
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<tr>
<td>PennDOT D9 Maintenance and Construction Vehicles</td>
<td>PennDOT D9 Maintenance and Construction Vehicles</td>
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<tr>
<td>PennDOT D9 TMC</td>
<td>PennDOT D9 TMC</td>
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<td>PennDOT Welcome Centers and Rest Areas</td>
<td>PennDOT Welcome Centers and Rest Areas</td>
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<td>PSP Offices</td>
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<td>PSP Troop T Highspire</td>
<td>PSP Troop T Highspire</td>
</tr>
<tr>
<td>PSP Troop T Vehicles</td>
<td>PSP Troop T Vehicles</td>
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<td>PSP Vehicles</td>
<td>PSP Vehicles</td>
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<tr>
<td>PTC Field Devices</td>
<td>PTC Field Devices</td>
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<tr>
<td>PTC Maintenance and Construction Vehicles</td>
<td>PTC Maintenance and Construction Vehicles</td>
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<tr>
<td>PTC Service Plaza</td>
<td>PTC Service Plaza</td>
</tr>
<tr>
<td>PTC Toll Plazas</td>
<td>PTC Toll Plazas</td>
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<tr>
<td>Regional Transit Field Devices</td>
<td>Regional Transit Field Devices</td>
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<tr>
<td>Regional Transit Service Plazas</td>
<td>Regional Transit Service Plazas</td>
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<tr>
<td>PENNSCOM Center</td>
<td>PENNSCOM Center</td>
</tr>
<tr>
<td>Towing Industry Responders</td>
<td>Towing Industry Responders</td>
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<td>Weather Information Providers</td>
<td>Weather Information Providers</td>
</tr>
<tr>
<td>&quot;x&quot;</td>
<td>&quot;x&quot;</td>
</tr>
</tbody>
</table>

**Legend:**
- **"X"** indicates the presence of an entity or service.
- **"x"** indicates the absence or non-applicability of an entity or service.

---

**Notes:**
- The table reflects a summary of various entities and services within the Regional ITS Architecture framework, categorized under PennDOT District 2-0.
- Each row represents a specific category or type of service, and the columns denote the presence or absence of that service across different regions or entities.
- The "x" symbol is used to indicate either the presence or absence of a service or entity, depending on the context provided in the table.

---

**Additional Information:**
- The table may need to be interpreted with additional context to fully understand the relationships and dependencies between different services and entities.
- Further details can be sought from the Regional ITS Architecture documentation or relevant PennDOT official sources.
4.4 ITS Architecture

This section documents the “information flow” between the elements. The information flows describe what data or information is passing between one operation and another operation. The section is primarily documented as Turbo software outputs.

References

The following references were utilized in the development of the District 2-0 Regional ITS Architecture:


- PennDOT District 2-0 Regional Operations Plan (ROP) – Final Report, Jacobs, August 2007

- PennDOT Southern Alleghenies Regional Operations Plan (ROP) – Final Report, Jacobs, August 2007
# Appendix A: Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tr>
<td>24x7</td>
<td>Twenty Four Hours of Operation, Seven Days a Week</td>
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<tr>
<td>AAA</td>
<td>American Automobile Association</td>
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<tr>
<td>AASHTO</td>
<td>American Association of State Highway and Transportation Officials</td>
</tr>
<tr>
<td>ADA</td>
<td>Americans with Disabilities Act</td>
</tr>
<tr>
<td>AHS</td>
<td>Automated Highway System</td>
</tr>
<tr>
<td>AMTRAN</td>
<td>Altoona Metro Transit</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
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<tr>
<td>ARMS</td>
<td>Automatic Real-Time Messaging</td>
</tr>
<tr>
<td>ASTM</td>
<td>American Society of Testing and Materials</td>
</tr>
<tr>
<td>ATIS</td>
<td>Advanced Traveler Information System</td>
</tr>
<tr>
<td>ATR</td>
<td>Automatic Traffic Recorders</td>
</tr>
<tr>
<td>AVL</td>
<td>Automatic Vehicle Location</td>
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<tr>
<td>BHSTE</td>
<td>Bureau of Highway Safety and Traffic Engineering</td>
</tr>
<tr>
<td>BOMO</td>
<td>Bureau of Maintenance and Operations</td>
</tr>
<tr>
<td>BPR</td>
<td>Bureau of Planning and Research</td>
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<td>BRT</td>
<td>Bus Rapid Transit</td>
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<td>CamTRAN</td>
<td>Cambria County Transit Authority</td>
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<td>CCTV</td>
<td>Closed Circuit Television</td>
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<td>CDC</td>
<td>Consolidated Dispatch Centers</td>
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<td>CDL</td>
<td>Commercial Drivers License</td>
</tr>
<tr>
<td>CVC</td>
<td>Commercial Vehicle Check</td>
</tr>
<tr>
<td>CVISN</td>
<td>Commercial Vehicle Information Systems and Networks</td>
</tr>
<tr>
<td>CVO</td>
<td>Commercial Vehicle Operations</td>
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<tr>
<td>DARC</td>
<td>Data Radio Channel</td>
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<tr>
<td>DMS</td>
<td>Dynamic Message Signs</td>
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<tr>
<td>DMV</td>
<td>Department of Motor Vehicles</td>
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<tr>
<td>DOT</td>
<td>Department of Transportation</td>
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<tr>
<td>DSRC</td>
<td>Designated Short Range Communication</td>
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<td>EMA</td>
<td>Emergency Management Agency</td>
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<td>EMS</td>
<td>Emergency Medical Services</td>
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<tr>
<td>ESP</td>
<td>Emergency Service Patrol</td>
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<tr>
<td>ETC</td>
<td>Electronic Toll Collection</td>
</tr>
<tr>
<td>E-Z Pass</td>
<td>Electronic toll collection system used by a consortium of toll authorities in northeast United States</td>
</tr>
<tr>
<td>FCC</td>
<td>Federal Communication Commission</td>
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<tr>
<td>FHWA</td>
<td>Federal Highway Administration</td>
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<td>FTA</td>
<td>Federal Transit Administration</td>
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<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<td>Highway Advisory Radio</td>
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<td>HAT</td>
<td>Highway Advisory Telephone System</td>
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<td>HAZMAT</td>
<td>Hazardous Materials</td>
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<td>HIA</td>
<td>Harrisburg International Airport</td>
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<td>HOV</td>
<td>High Occupancy Vehicle</td>
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<td>HRI</td>
<td>Highway Rail Intersection</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<td>--------------</td>
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<tr>
<td>IEEE</td>
<td>Institute of Electrical and Electronics Engineers</td>
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<td>IEN</td>
<td>Information Exchange Network</td>
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<td>IM</td>
<td>Incident Management</td>
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<td>IIMS</td>
<td>Incident Information Management System</td>
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<tr>
<td>IMMS</td>
<td>Incident Management Message Sets</td>
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<tr>
<td>ISP</td>
<td>Information Service Provider</td>
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<tr>
<td>ITS</td>
<td>Intelligent Transportation System</td>
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<td>MCSAP</td>
<td>Motor Carrier Safety Assistance Program</td>
</tr>
<tr>
<td>MDSHA</td>
<td>Maryland State Highway Administration</td>
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<td>MEMA</td>
<td>Maryland Emergency Management Agency</td>
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<tr>
<td>MOE</td>
<td>Measures of Effectiveness</td>
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<td>MOU</td>
<td>Memorandum of Understanding</td>
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<tr>
<td>m.p.</td>
<td>Milepost</td>
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<td>NEMA</td>
<td>National Electrical Manufacturers Association</td>
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<td>NHII</td>
<td>National Highway Institute</td>
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<tr>
<td>NTCIP</td>
<td>National Transportation Communications for ITS Protocols</td>
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<td>NWS</td>
<td>National Weather Service</td>
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<td>Onboard</td>
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<td>OER</td>
<td>Octet Encoding Rules</td>
</tr>
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<td>O&amp;M</td>
<td>Operations and Maintenance</td>
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<td>Office of Emergency Management</td>
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<td>OEM</td>
<td>Office of Emergency Management</td>
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<tr>
<td>PDA</td>
<td>Personal Digital Assistant</td>
</tr>
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<td>PEIRS</td>
<td>Pennsylvania Emergency Information Reporting System</td>
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<tr>
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<td>Pennsylvania Emergency Management Agency</td>
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<tr>
<td>PennDOT</td>
<td>Pennsylvania Department of Transportation</td>
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<tr>
<td>PRISM</td>
<td>Performance and Registration Information Systems Management</td>
</tr>
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<td>Pennsylvania State Police</td>
</tr>
<tr>
<td>PSAP</td>
<td>Public Safety Answering Point</td>
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<tr>
<td>PTC</td>
<td>Pennsylvania Turnpike Commission</td>
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<tr>
<td>RAP</td>
<td>Regional Advisory Panel</td>
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<td>RAPID</td>
<td>Regional Agile Port Intermodal Distribution System</td>
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<td>Rural Planning Organization</td>
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<td>Regional Transportation Management Center</td>
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<td>Road Weather Information System</td>
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<td>SAFER</td>
<td>Safety and Fitness Electronic Record</td>
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<td>SATIN</td>
<td>Service Area Travelers Interactive Network</td>
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<td>SCADA</td>
<td>Supervisory Control and Data Acquisition</td>
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<td>SCH</td>
<td>Scheduling/Run Cutting</td>
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<td>Strategic Focus Area</td>
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<td>STMC</td>
<td>Statewide Transportation Management Center</td>
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<td>Simple Transportation Management Framework</td>
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<td>High Bandwidth Telephone Line</td>
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<td>Transportation Improvement Plan</td>
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<td>Transportation Management Center</td>
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<tr>
<td>WIM</td>
<td>Weigh in Motion</td>
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</table>
Appendix B: ITS Definitions
(Source: DVRPC Regional ITS Architecture)

The following definitions for ITS terms may or may not apply specifically to the Region. They are provided as reference material to support ITS terminology found in and outside of this report.

Automatic Vehicle Location: This technology is used by various agencies, including transit and emergency management agencies, to constantly monitor the location of their vehicles. Transit agencies utilize AVL as a management tool to track the progress of buses and to determine when remedial action is required if buses are not adhering to schedule. Emergency dispatchers rely upon AVL to help guide their selection of which vehicle to dispatch to a call. AVL technology relies upon GPS or triangulation as the mechanism for locating vehicles.

Cellular Phone Number for Incident Reporting: Several toll authorities have reserved cellular phone numbers, such as *11 for the Pennsylvania Turnpike, for use by motorists to report disabled vehicles or incidents while en-route. The numbers are usually toll-free and go directly to the agency’s operations center. Several highway departments have posted signs directing motorists to dial cellular 911 to report incidents.

Closed Circuit Television: CCTV is real-time video surveillance equipment, monitored and manipulated by operations personnel. For highways, CCTV’s are installed at locations where accident rates and/or congestion levels are known to be high. The cameras dispatch real-time video images to the traffic operation centers so that in emergency situations a quicker response can be provided. Transit agencies deploy CCTV cameras to observe transit passengers for transit management (crowding levels), fare collection, and security purposes.

Closed Loop Traffic Signal System: For this system, traffic signals are interconnected along specified corridors to provide for ease in traffic flow. The signals may be monitored by detectors and adjusted according to current traffic conditions, or preprogrammed with a number of signal timing plans that vary by time of day and day of week.

Commercial Vehicle Electronic Administration Processes: This process allows commercial vehicle operators to obtain necessary permits via computer and supports the exchange of safety and credentials data among multiple jurisdictions and between agencies within a single jurisdiction.

Dynamic Message Sign: The purpose of the DMS’s is to provide real-time en-route travel advisories to travelers. For highways, the DMS signs are either centered over travel lanes or placed alongside the roadway. Messages on permanent DMS signs typically originate from a traffic control center. For transit systems, DMS’s take the form of dynamic message boards located in waiting areas and/or platforms to provide information on train arrivals, departures, and platform locations.
Emergency Call Boxes: Emergency call boxes permit travelers who do not have cellular phones a mechanism to report accidents and other emergency situations. They are used by both highway and transit travelers. Call boxes are typically located along the side of an expressway at mile or half mile intervals. Transit agencies place them in waiting areas and on platforms to improve the security of passengers.

E-Z Pass: E-Z Pass is an electronic toll collection system developed by a consortium of toll agencies located in the northeast United States. When a vehicle passes through an E-Z Pass designated toll lane, an electronic tag, in the form of a small box mounted on a vehicle windshield, is detected by an antenna and the appropriate toll is deducted from the customer's prepaid E-Z Pass account. Because of the alliance, E-Z Pass will eventually be employed on all toll bridges and roads in the region.

Highway Advisory Radio: HAR provides travelers with real-time roadway information, including weather information, agency hotline numbers, incident information, and roadway construction advisories, directly over their car radio. The FCC reserves certain AM and FM frequencies specific to whatever jurisdiction in which they are located for public agencies to broadcast these special travel advisories.

Kiosks: A number of organizations have plans to install travel information kiosks at tourist centers, government buildings, and highway service areas. Travelers will be able to obtain current traffic and transit information, information about places to visit, route planning information, and hotel reservations. Generally kiosks will be more interactive and offer more choices than the static traveler information services currently available.

Management Center: Management centers are the focal point and communications hub of an agency's operation. Almost all transit, highway and bridge agencies in the region have their own control centers. These facilities monitor and control an agency's highway or transit network and are responsible for incident management. While the equipment in each operating center varies by agency, the typical control center consists of any number of computer workstations, radio scanners, TV monitors, audio text recording booths to record HAR messages, and fax machines for broadcasting information to other agencies. Depending on agency needs, a highway control center can include capabilities to operate computerized traffic signal systems, Dynamic message signs and highway advisory radios, monitor CCTV's, manage emergency service patrols, and coordinate incident management response teams. Composition of transit operation centers vary based upon whether rail or bus operations are involved.

Ramp Metering: Ramp metering is designed to control the rate of traffic entering a freeway. The objective is to maintain a predetermined level of service on the freeway by adjusting the on-ramp traffic volume with a traffic control signal. Typical waiting times at ramp metering signals are between 5 to 6 seconds per vehicle.

Road Weather Information System: RWIS are typically installed at locations that experience a higher-than-average number of accidents attributable to fog, snow or icy conditions. Sensor information can be used to more effectively deploy road maintenance resources, issue weather-specific warnings to drivers and general advisories to motorists. Weather sensors are connected to remote processing units.
located in the field which measure, collect, and pre-process environmental data and then transmit the information to an operations center where staff can act on the information.

**Signal Priority:** This technology allows transit vehicles to send direct control requests to signalized intersections. These messages result in preemption of the current signal control plan and grants right-of-way to the requesting transit and emergency vehicles.

**Service Patrols:** The Service Patrol program is designed to improve the efficiency of the highway system through the quick resolution of minor incidents, including disabled vehicles, vehicles out of gas, and minor accidents that impact traffic flow. Service Patrol vans patrol along highways and provide assistance to disabled vehicles. Service Patrol operators are equipped to perform minor repairs such as changing a flat tire or providing gasoline. When major repairs are needed, Service Patrol operators can assist the motorist in contacting a towing company to remove the disabled vehicle. Service Patrol’s also reduce the risk of secondary accidents by deploying appropriate warning devices.

**Traveler Cards:** This technology provides the capability for the traveler to use a common fare instrument for all surface transportation services (i.e., multiple transit agencies, parking facilities, toll roads), to pay without stopping, and have the payment media automatically identified as invalid or its eligibility verified. In addition, smart cards have the capability to provide expansion into other uses as payment for retail purchases, telephone services and for off-line billing for fares paid to agencies.

**Traveler Information Website:** This type of website is used to access traveler information prior to starting a trip. Currently, most of the existing travel websites in the region offer only construction or special event information. Eventually, real-time, route-specific travel reports will be found on the websites. SmartRoute, under contract to PennDOT, provides real-time travel information on selected highways and transit facilities in the region.

**Weigh-In-Motion Station:** Weight measuring equipment, including fixed sensors embedded in the pavement, can ascertain the weight of a commercial vehicle at highway speeds to ensure the vehicle is operating within legal weight limits. Ultimately, WIM stations will be utilized to assess motor vehicle taxes on commercial carriers.
Appendix C: Subsystem and Terminator Definitions  
(Source: National ITS Architecture)

Appendix C contains the subsystems and terminators from the National ITS Architecture exclusive to the Regional ITS Architecture:

**Archived Data Management:** The Archived Data Management Subsystem collects, archives, manages, and distributes data generated from ITS sources for use in transportation administration, policy evaluation, safety, planning, performance monitoring, program assessment, operations, and research applications. The data received is formatted, tagged with attributes that define the data source, conditions under which it was collected, data transformations, and other information (i.e. meta data) necessary to interpret the data. The subsystem can fuse ITS generated data with data from non-ITS sources and other archives to generate information products utilizing data from multiple functional areas, modes, and jurisdictions. The subsystem prepares data products that can serve as inputs to Federal, State, and local data reporting systems. This subsystem may be implemented in many different ways. It may reside within an operational center and provide focused access to a particular agency's data archives. Alternatively, it may operate as a distinct center that collects data from multiple agencies and sources and provides a general data warehouse service for a region.

**Archived Data User Systems:** This terminator represents the systems users employ to access archived data. The general interface provided from this terminator allows a broad range of users (e.g. planners, researchers, analysts, operators) and their systems (e.g. databases, models, analytical tools, user interface devices) to acquire data and analyses results from the archive.

**Commercial Vehicle Administration:** The Commercial Vehicle Administration Subsystem will operate at one or more fixed locations within a region. This subsystem performs administrative functions supporting credentials, tax, and safety regulations. It issues credentials, collects fees and taxes, and supports enforcement of credential requirements. This subsystem communicates with the Fleet Management Subsystems associated with the motor carriers to process credentials applications and collect fuel taxes, weight/distance taxes, and other taxes and fees associated with commercial vehicle operations. The subsystem also receives applications for, and issues special Oversize/Overweight and HAZMAT permits in coordination with other cognizant authorities. The subsystem coordinates with other Commercial Vehicle Administration Subsystems (in other states/regions) to support nationwide access to credentials and safety information for administration and enforcement functions. This subsystem supports communications with Commercial Vehicle Check Subsystems operating at the roadside to enable credential checking and safety information collection. The collected safety information is processed, stored, and made available to qualified stakeholders to identify carriers and drivers that operate unsafely.

**Commercial Vehicle Check:** The Commercial Vehicle Check Subsystem supports automated vehicle identification at mainline speeds for credential checking, roadside safety inspections, and weigh-in-motion using two-way data exchange. These capabilities include providing warnings to the commercial vehicle drivers, their fleet
managers, and proper authorities of any safety problems that have been identified, accessing and examining historical safety data, and automatically deciding whether to allow the vehicle to pass or require it to stop with operator manual override. The Commercial Vehicle Check Subsystem also provides supplemental inspection services to current capabilities by supporting expedited brake inspections, the use of operator hand-held devices, on-board safety database access, and the enrollment of vehicles and carriers in electronic clearance.

**Commercial Vehicle Subsystem:** This subsystem resides in a commercial vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient commercial vehicle operations. The Commercial Vehicle Subsystem provides two-way communications between the commercial vehicle drivers, their fleet managers, and roadside officials, and provides HAZMAT response teams with timely and accurate cargo contents information after a vehicle incident. This subsystem provides the capability to collect and process vehicle, cargo, and driver safety data and status and alert the driver whenever there is a potential safety problem. Basic identification and safety status data are supplied to inspection facilities at mainline speeds.

**Emergency Management:** The Emergency Management Subsystem represents public safety and other allied agency systems that support coordinated traffic incident management and emergency response. The subsystem includes the functions associated with fixed and mobile public safety communications centers includes various public safety call taker and dispatch centers operated by police, fire, and emergency medical services. This subsystem also represents other allied systems including centers associated with towing and recovery, freeway service patrols, HAZMAT response teams, mayday service providers, and security/surveillance services that improve traveler security in public areas. This subsystem interfaces with other Emergency Management Subsystems to support coordinated emergency response involving multiple agencies. The subsystem creates, stores, and utilizes emergency response plans to facilitate coordinated response. The subsystem tracks and manages emergency vehicle fleets using automated vehicle location technology and two way communications with the vehicle fleet. Real-time traffic information received from the other center subsystems is used to further aide the emergency dispatcher in selecting the emergency vehicle(s) and routes that will provide the timeliest response. Interface with the Traffic Management Subsystem allows strategic coordination in tailoring traffic control to support en-route emergency vehicles. Interface with the Transit Management Subsystem allows coordinated use of transit vehicles to facilitate response to major emergencies.

**Emergency Telecommunications System:** This terminator represents the telecommunications systems that connect a caller with a Public Safety Answering Point (PSAP). These systems transparently support priority wireline and wireless caller access to the PSAP through 9-1-1 and other access mechanisms like 7 digit local access numbers, and motorist aid call boxes. The calls are routed to the appropriate PSAP, based on caller location when this information is available.

**Emergency Vehicle:** This subsystem resides in an emergency vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient incident response. The subsystem represents a range of vehicles including those operated by police, fire, and emergency medical services. In addition, this
subsystem represents other incident response vehicles including towing and recovery vehicles and freeway service patrols. The Emergency Vehicle Subsystem includes two-way communications to support coordinated response to emergencies in accordance with an associated Emergency Management Subsystem. Emergency vehicles are equipped with automated vehicle location capability for monitoring by vehicle tracking and fleet management functions in the Emergency Management Subsystem. Using these capabilities, the appropriate emergency vehicle to respond to each emergency is determined. Route guidance capabilities within the vehicle enable safe and efficient routing to the emergency. In addition, the emergency vehicle may be equipped to support signal preemption through communications with the Roadway Subsystem.

**Fleet and Freight Management:** The Fleet and Freight Management Subsystem provides the capability for commercial drivers and dispatchers to receive real-time routing information and access databases containing vehicle and cargo locations as well as carrier, vehicle, cargo and driver information. In addition, the capability to purchase credentials electronically shall also be provided, with automated and efficient connections to financial institutions and regulatory agencies, along with post-trip automated mileage and fuel usage reporting. The Fleet Management Subsystem also provides the capability for fleet managers to monitor the safety of their commercial vehicle drivers and fleet. The subsystem also supports application for hazmat credentials and makes information about hazmat cargo available to agencies as required. Within this subsystem lies all the functionality associated with subsystems and components necessary to enroll and participate in international goods movement programs aimed at enhancing trade and transportation safety.

**Information Service Provider:** This subsystem collects, processes, stores, and disseminates transportation information to system operators and the traveling public. The subsystem can play several different roles in an integrated ITS. In one role, the ISP provides a general data warehousing function, collecting information from transportation system operators and redistributing this information to other system operators in the region and other ISPs. In this information redistribution role, the ISP provides a bridge between the various transportation systems that produce the information and the other ISPs and their subscribers that use the information. The second role of an ISP is focused on delivery of traveler information to subscribers and the public at large. Information provided includes basic advisories, traffic and road conditions, transit schedule information, yellow pages information, ride matching information, and parking information. The subsystem also provides the capability to provide specific directions to travelers by receiving origin and destination requests from travelers, generating route plans, and returning the calculated plans to the users. In addition to general route planning for travelers, the ISP also supports specialized route planning for vehicle fleets. In this third role, the ISP function may be dedicated to, or even embedded within, the dispatch system. Reservation services are also provided in advanced implementations. The information is provided to the traveler through the Personal Information Access Subsystem, Remote Traveler Support Subsystem, and various Vehicle Subsystems through available communications links. Both basic one-way (broadcast) and personalized two-way information provision is supported. The subsystem provides the capability for an informational infrastructure to connect providers and consumers, and gather that market information needed to assist in the planning of service improvements and in maintenance of operations.
Maintenance and Construction Management: The Maintenance and Construction Management Subsystem monitors and manages roadway infrastructure construction and maintenance activities. Representing both public agencies and private contractors that provide these functions, this subsystem manages fleets of maintenance, construction, or special service vehicles (e.g., snow and ice control equipment). The subsystem receives a wide range of status information from these vehicles and performs vehicle dispatch, routing, and resource management for the vehicle fleets and associated equipment. The subsystem participates in incident response by deploying maintenance and construction resources to an incident scene, in coordination with other center subsystems. The subsystem manages equipment at the roadside, including environmental sensors and automated systems that monitor and mitigate adverse road and surface weather conditions. The subsystem manages the repair and maintenance of both non-ITS and ITS equipment including the traffic controllers, detectors, dynamic message signs, signals, and other equipment associated with the roadway infrastructure. Additional interfaces to weather information providers (the weather service and surface transportation weather service providers) provide current and forecast weather information that can be fused with other data sources and used to support advanced decision support systems that increase the efficiency and effectiveness of maintenance and construction operations.

The subsystem remotely monitors and manages ITS capabilities in work zones, gathering, storing, and disseminating work zone information to other systems. It manages traffic in the vicinity of the work zone and advises drivers of work zone status (either directly at the roadside or through an interface with the Information Service Provider or Traffic Management subsystems.) It schedules and manages the location and usage of maintenance assets (such as portable dynamic message signs). Construction and maintenance activities are tracked and coordinated with other systems, improving the quality and accuracy of information available regarding closures and other roadway construction and maintenance activities.

Maintenance and Construction Vehicle: This subsystem resides in a maintenance, construction, or other specialized service vehicles or equipment and provides the sensory, processing, storage, and communications functions necessary to support highway maintenance and construction. All types of maintenance and construction vehicles are covered, including heavy equipment and supervisory vehicles. The subsystem provides two-way communications between drivers/operators and dispatchers and maintains and communicates current location and status information. A wide range of operational status is monitored, measured, and made available, depending on the specific type of vehicle or equipment. For example, for a snow plow, the information would include whether the plow is up or down and material usage information. The subsystem may also contain capabilities to monitor vehicle systems to support maintenance of the vehicle itself and other sensors that monitor environmental conditions including the road condition and surface weather information. This subsystem can represent a diverse set of mobile environmental sensing platforms, including wheeled vehicles and any other vehicle that collects and reports environmental information.

Media: This terminator represents the information systems that provide traffic reports, travel conditions, and other transportation-related news services to the traveling public through radio, TV, and other media. Traffic and travel advisory information that are
collected by ITS are provided to this terminator. It is also a source for traffic flow information, incident and special event information, and other events which may have implications for the transportation system.

**Parking Management:** The Parking Management Subsystem provides electronic monitoring and management of parking facilities. It supports a DSRC communications link to the Vehicle Subsystem that allows electronic collection of parking fees. It also includes the instrumentation, signs, and other infrastructure that monitors parking lot usage and provides local information about parking availability and other general parking information. This portion of the subsystem functionality must be located in the parking facility where it can monitor, classify, and share information with customers and their vehicles. The subsystem also interfaces with the financial infrastructure and broadly disseminates parking information to other operational centers in the region. Note that the latter functionality may be located in a back office, remote from the parking facility.

**Personal Information Access:** This subsystem provides the capability for travelers to receive formatted traffic advisories from their homes, place of work, major trip generation sites, personal portable devices, and over multiple types of electronic media. These capabilities shall also provide basic routing information and allow users to select those transportation modes that allow them to avoid congestion, or more advanced capabilities to allow users to specify those transportation parameters that are unique to their individual needs and receive travel information. This subsystem shall provide capabilities to receive route planning from the infrastructure at fixed locations such as in their homes, their place of work, and at mobile locations such as from personal portable devices and in the vehicle or perform the route planning process at a mobile information access location. In addition to end user devices, this subsystem may also represent a device that is used by a merchant or other service provider to receive traveler information and relay important information to their customers. This subsystem shall also provide the capability to initiate a distress signal and cancel a prior issued manual request for help.

**Remote Traveler Support:** This subsystem provides access to traveler information at transit stations, transit stops, other fixed sites along travel routes (e.g., rest stops, merchant locations), and at major trip generation locations such as special event centers, hotels, office complexes, amusement parks, and theaters. Traveler information access points include kiosks and informational displays supporting varied levels of interaction and information access. At transit stops, simple displays providing schedule information and imminent arrival signals can be provided. This basic information may be extended to include multi-modal information including traffic conditions and transit schedules along with yellow pages information to support mode and route selection at major trip generation sites. Personalized route planning and route guidance information can also be provided based on criteria supplied by the traveler. In addition to traveler information provision, this subsystem also supports public safety monitoring using CCTV cameras or other surveillance equipment and emergency notification within these public areas. Fare card maintenance, and other features which enhance traveler convenience may also be provided at the discretion of the deploying agency.

**Roadway:** This subsystem includes the equipment distributed on and along the roadway which monitors and controls traffic and monitors and manages the roadway itself. Equipment includes traffic detectors, environmental sensors, traffic signals,
highway advisory radios, dynamic message signs, CCTV cameras and video image processing systems, grade crossing warning systems, and freeway ramp metering systems. HOV lane management and reversible lane management functions are also available. This subsystem also provides the capability for environmental monitoring including sensors that measure road conditions, surface weather, and vehicle emissions. In adverse conditions, automated systems can be used to apply anti-icing materials, disperse fog, etc. Work zone systems including work zone surveillance, traffic control, driver warning, and work crew safety systems are also included. In advanced implementations, this subsystem supports automated vehicle safety systems by safely controlling access to and egress from an Automated Highway System through monitoring of, and communications with, AHS vehicles. Intersection collision avoidance functions are provided by determining the probability of a collision in the intersection and sending appropriate warnings and/or control actions to the approaching vehicles.

**Toll Administration:** The Toll Administration Subsystem provides general payment administration capabilities and supports the electronic transfer of authenticated funds from the customer to the transportation system operator. This subsystem supports traveler enrollment and collection of both pre-payment and post-payment transportation fees in coordination with the existing, and evolving financial infrastructure supporting electronic payment transactions. The system may establish and administer escrow accounts depending on the clearinghouse scheme and the type of payments involved. This subsystem posts a transaction to the customer account and generates a bill (for post-payment accounts), debits an escrow account, or interfaces to the financial infrastructure to debit a customer designated account. It supports communications with the Toll Collection Subsystem to support fee collection operations. The subsystem also sets and administers the pricing structures and includes the capability to implement road pricing policies in coordination with the Traffic Management Subsystem. The electronic financial transactions in which this subsystem is an intermediary between the customer and the financial infrastructure shall be cryptographically protected and authenticated to preserve privacy and ensure authenticity and auditability.

**Toll Collection:** The Toll Collection Subsystem provides the capability for vehicle operators to pay tolls without stopping their vehicles using locally determined pricing structures and including the capability to implement various variable road pricing policies. Each transaction is accompanied by feedback to the customer who indicates the general status of the customer account. A record of the transactions is provided to the Toll Administration subsystem for reconciliation.

**Traffic Management:** The Traffic Management Subsystem operates within a traffic management center or other fixed location. This subsystem communicates with the Roadway Subsystem to monitor and manage traffic flow. Incidents are detected and verified and incident information is provided to the Emergency Management Subsystem, travelers (through Roadway Subsystem Highway Advisory Radio and Dynamic Message Signs), and to third party providers. The subsystem supports HOV lane management and coordination, road pricing, and other demand management policies that can alleviate congestion and influence mode selection. The subsystem monitors and manages maintenance work and disseminates maintenance work schedules and road closures. The subsystem also manages reversible lane facilities, and processes probe vehicle information. The subsystem communicates with other Traffic Management Subsystems to coordinate traffic information and control strategies neighboring
jurisdictions. It also coordinates with rail operations to support safer and more efficient highway traffic management at highway-rail intersections. Finally, the Traffic Management Subsystem provides the capabilities to exercise control over those devices utilized for AHS traffic and vehicle control.

**Transit Management:** The transit management subsystem manages transit vehicle fleets and coordinates with other modes and transportation services. It provides operations, maintenance, customer information, planning, and management functions for the transit property. It spans distinct central dispatch and garage management systems and supports the spectrum of fixed route, flexible route, paratransit services, and bus rapid transit (BRT) service. The subsystem's interfaces allow for communication between transit departments and with other operating entities such as emergency response services and traffic management systems. This subsystem receives special event and real-time incident data from the traffic management subsystem. It provides current transit operations data to other center subsystems. The Transit Management Subsystem collects and stores accurate ridership levels and implements corresponding fare structures. It collects operational and maintenance data from transit vehicles, manages vehicle service histories, and assigns drivers and maintenance personnel to vehicles and routes. The Transit Management Subsystem also provides the capability for automated planning and scheduling of public transit operations. It furnishes travelers with real-time travel information, continuously updated schedules, schedule adherence information, transfer options, and transit routes and fares. In addition, the monitoring of key transit locations with both video and audio systems is provided with automatic alerting of operators and police of potential incidents including support for traveler activated alarms.

**Transit Vehicle:** This subsystem resides in a transit vehicle and provides the sensory, processing, storage, and communications functions necessary to support safe and efficient movement of passengers. The Transit Vehicle Subsystem collects accurate ridership levels and supports electronic fare collection. An optional traffic signal prioritization function communicates with the roadside subsystem to improve on-schedule performance. Automated vehicle location functions enhance the information available to the Transit Management Subsystem enabling more efficient operations. On-board sensors support transit vehicle maintenance. The Transit Vehicle Subsystem also furnishes travelers with real-time travel information, continuously updated schedules, transfer options, routes, and fares.

**Traveler Card:** This terminator represents the entity that enables the actual transfer of electronic information from the user of a service (i.e. a traveler) to the provider of the service. This may include the transfer of funds through means of an electronic payment instrument. The device, like a smart card, may also hold and update the traveler's information such as personal profiles or trip histories.

**Vehicle:** This subsystem provides the sensory, processing, storage, and communications functions necessary to support efficient, safe, and convenient travel. These functions reside in general vehicles including personal automobiles, commercial vehicles, emergency vehicles, transit vehicles, or other vehicle types. Information services provide the driver with current travel conditions and the availability of services along the route and at the destination. Both one-way and two-way communications options support a spectrum of information services from low-cost broadcast services to advanced, pay for use personalized information services. Route guidance capabilities
assist in formulation of an optimal route and step by step guidance along the travel route. Advanced sensors, processors, enhanced driver interfaces, and actuators complement the driver information services so that, in addition to making informed mode and route selections, the driver travels these routes in a safer and more consistent manner. Initial collision avoidance functions provide “vigilant co-pilot” driver warning capabilities. More advanced functions assume limited control of the vehicle to maintain safe headway. Ultimately, this subsystem supports completely automated vehicle operation through advanced communications with other vehicles in the vicinity and in coordination with supporting infrastructure subsystems. Pre-crash safety systems are deployed and emergency notification messages are issued when unavoidable collisions do occur.
Appendix D: Architecture Flow Definitions
(Source: National ITS Architecture)

Appendix D contains the architecture flow definitions from the National ITS Architecture exclusive to the Regional ITS Architecture:

**accident report:** Report of commercial vehicle safety accident. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.

**archive coordination:** Catalog data, meta data, published data, and other information exchanged between archives to support data synchronization and satisfy user data requests.

**archive requests:** A request to a data source for information on available data (i.e. "catalog") or a request that defines the data to be archived. The request can be a general subscription intended to initiate a continuous or regular data stream or a specific request.

**archive status:** Notification that data provided to an archive contains erroneous, missing, or suspicious data or verification that the data provided appears valid. If an error has been detected, the offending data and the nature of the potential problem are identified.

**audit data:** Information to support a tax audit.

**broadcast information:** General broadcast information that contains link travel times, incidents, advisories, transit services and a myriad of other traveler information.

**commercial vehicle archive data:** Information describing commercial vehicle travel and commodity flow characteristics. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.

**compliance review report:** Report containing results of carrier compliance review, including concomitant out-of-service notifications, carrier warnings/notifications. The information may be provided as a response to a real-time query or proactively by the source.

**credential application:** Application for commercial vehicle credentials. Authorization for payment is included.

**credentials information:** Response containing full credentials information. "Response" may be provided in reaction to a real-time query or a standing request for updated information. The query flow is not explicitly shown.

**credentials status information:** Credentials information such as registration, licensing, insurance, check flags, and electronic screening enrollment data. A unique identifier is included. Corresponds to the credentials portion of CVISN "snapshots."
current asset restrictions: Restrictions levied on transportation asset usage based on infrastructure design, surveys, tests, or analyses. This includes standard facility design height, width, and weight restrictions, special restrictions such as spring weight restrictions.

daily site activity data: Record of daily activities at commercial vehicle check stations including summaries of screening events and inspections.

data collection and monitoring control: Information used to configure and control data collection and monitoring systems.

driver instructions: Transit service instructions, traffic information, road conditions, and other information for both transit and paratransit drivers.

driver to fleet request: Requests from the driver and vehicle for routing, payment, and enrollment information.

emergency archive data: Logged incident information that characterizes the identified incidents and provides a record of the corresponding incident response. Content may include a catalog of available information, the actual information to be archived, and associated meta data.

emergency dispatch requests: Emergency vehicle dispatch instructions including incident location and available information concerning the incident.

emergency dispatch response: Request for additional emergency dispatch information (e.g., a suggested route) and provision of en route status.

emergency notification: An emergency request for assistance originated by a traveler using an in-vehicle, public access, or personal device.

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

emergency traffic control response: Status of the special traffic signal control strategy implemented in response to the emergency traffic control request.

emergency vehicle tracking data: The current location and operating status of the emergency vehicle.

environmental conditions data: Current road conditions (e.g., surface temperature, subsurface temperature, moisture, icing, treatment status) and surface weather conditions (e.g., air temperature, wind speed, precipitation, visibility) as measured and reported by environmental sensors.

environmental sensors control: Data used to configure and control environmental sensors.
equipment maintenance status: Current status of field equipment maintenance actions.

event confirmation: Confirmation that special event details have been received and processed.

event information: Special event information for travelers. This would include a broader array of information than the similar "event plans" that conveys only information necessary to support traffic management for the event.

event plans: Plans for major events possibly impacting traffic.

external reports: Traffic and incident information that is collected by the media through a variety of mechanisms (e.g., radio station call-in programs, air surveillance).

fare and payment status: Current fare collection information including the operational status of the fare collection equipment and financial payment transaction data.

fare management information: Transit fare information and transaction data used to manage transit fare processing on the transit vehicle.

field device status: Reports from field equipment (sensors, signals, signs, controllers, etc.) which indicate current operational status.

fleet to driver update: Updated instructions to the driver including dispatch, routing, and special instructions.

freeway control data: Control commands and operating parameters for ramp meters, mainline metering/lane controls and other systems associated with freeway operations.

freeway control status: Current operational status and operating parameters for ramp meters, mainline metering/lane controls and other control equipment associated with freeway operations.

hazmat information: Information about a particular hazmat load including nature of the load and unloading instructions. May also include hazmat vehicle route and route update information.

hazmat information request: Request for information about a particular hazmat load.

high threat facility incident information: Threats regarding transportation infrastructure, facilities, or systems detected by a variety of methods (sensors, surveillance, threat analysis of advisories from outside agencies, etc.

incident command information: Information that supports local management of an incident. It includes resource deployment status, hazardous material information, traffic, road, and weather conditions, evacuation advice, and other information.
incident command request: Request for resources, commands for relay to other allied response agencies, and other requests that reflect local command of an evolving incident response.

incident information: Notification of existence of incident and expected severity, location, time and nature of incident.

incident information for media: Report of current desensitized incident information prepared for public dissemination through the media.

incident information request: Request for incident information, clearing time, severity. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.

incident notification: The notification of an incident including its nature, severity, and location.

incident notification response: Interactive acknowledgement and verification of the incident information received, requests for additional information, and general information on incident response status.

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

incident response coordination: Incident response procedures, resource coordination, and current incident response status that are shared between allied response agencies to support a coordinated response to incidents.

incident response status: Status of the current incident response including traffic management strategies implemented at the site (e.g., closures, diversions, traffic signal control overrides).

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

infrastructure monitoring sensor control: Data used to configure and control infrastructure monitoring sensors.

infrastructure monitoring sensor data: Data read from infrastructure-based sensors that monitor the condition of pavement, bridges, culverts, signs, and other roadway infrastructure.

ISP coordination: Coordination and exchange of transportation information between centers. This flow allows a broad range of transportation information collected by one ISP to be redistributed to many other ISPs and their clients.

maint and constr dispatch information: Information used to dispatch maintenance and construction vehicles, equipment, and crews. This information includes routing information, traffic information, road restrictions, incident information, environmental information, and decision support information.
**maint and constr dispatch status:** Current maintenance and construction status including work data, operator status, crew status, and equipment status.

**maint and constr resource coordination:** Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response.

**maint and constr resource request:** Request for road maintenance and construction resources that can be used in the diversion of traffic (cones, portable signs), clearance of a road hazard, repair of ancillary damage, or any other incident response.

**maint and constr resource response:** Current status of maintenance and construction resources including availability and deployment status.

**maint and constr vehicle conditions:** Vehicle diagnostics information that is collected, filtered, and selectively reported by a maintenance and construction vehicle. The information includes engine temperature, mileage, tire wear, brake wear, belt wear, and any warnings or alarms.

**maint and constr vehicle location data:** The current location and related status (e.g., direction and speed) of the maintenance/construction vehicle.

**maint and constr vehicle operational data:** Data that describes the maintenance and construction activity performed by the vehicle. Operational data includes materials usage (amount stored and current application rate), operational state of the maintenance equipment (e.g., blade up/down, etc.).

**maint and constr vehicle system control:** Configure and control data that supports remote control of on-board maintenance and construction vehicle systems and field equipment that is remotely controlled by the vehicle. For example, the data can be used to adjust material application rates.

**maint and constr work plans:** Future construction and maintenance work schedules and activities including anticipated closures with anticipated impact to the roadway, alternate routes, anticipated delays, closure times, and durations.

**media information request:** Request from the media for current transportation information.

**on-board safety data:** Safety data measured by on-board sensors. Includes information about the vehicle, vehicle components, cargo, and driver.

**on-board safety request:** Request for on-board vehicle safety data by the roadside equipment.

**on-board vehicle data:** Information about the commercial vehicle stored on-board (for maintenance purposes, gate access, cargo status, lock status, etc.).

**on-board vehicle request:** Request for on-board vehicle data.
personal transit information: General and personalized transit information for a particular fixed route, flexible route, or paratransit system.

remote surveillance control: The control commands used to remotely operate another center’s sensors or surveillance equipment so that roadside surveillance assets can be shared by more than one agency.

request for right-of-way: Forwarded request from signal prioritization, signal preemption, pedestrian call, multi-modal crossing activation, or other source for right-of-way.

request for road network conditions: Request for traffic information, road conditions, surface weather conditions, incident information, and other road network status. The request specifies the region/route of interest, the desired effective time period, and other parameters.

request tag data: Request for tag information including credit identity, stored value card cash, etc.

resource deployment status: Status of traffic management center resource deployment identifying the resources available and their current deployment status.

resource request: A request for traffic management resources to implement special traffic control measures, assist in clean up, verify an incident, etc.

road network conditions: Current and forecasted traffic information, road and weather conditions, incident information, and other road network status. Either raw data, processed data, or some combination of both may be provided by this architecture flow.

road weather information: Road conditions and weather information that are made available by road maintenance operations to other transportation system operators.

roadway information system data: Information used to initialize, configure, and control roadside systems that provide driver information (e.g., dynamic message signs, highway advisory radio, and beacon systems). This flow can provide message content and delivery attributes.

roadway information system status: Current operating status of dynamic message signs, highway advisory radios, beacon systems, or other configurable field equipment that provides dynamic information to the driver.

roadway maintenance status: Summary of maintenance fleet operations affecting the road network. This includes the status of winter maintenance (snow plow schedule and current status).

roadway treatment system control: Control data for remotely located, automated devices that affect the roadway surface (e.g. de-icing applications).
roadway treatment system status: Current operational status of automated roadway treatment devices (e.g., anti-icing systems).

safety inspection record: Record containing results of commercial vehicle safety inspection.

safety inspection report: Report containing results of commercial vehicle safety inspection. The information may be provided as a response to a real-time query or proactively by the source. The query flow is not explicitly shown.

safety status information: Safety information such as safety ratings, inspection summaries, and violation summaries. A unique identifier is included. Corresponds to the safety portion of CVISN "snapshots." The status information may be provided as a response to a real-time query screening event record Results of CVO electronic screening activity.

secure area monitoring support: Commands that control surveillance equipment and security sensors that monitor secure public transportation areas. Also includes information for general advisories and alerts intended for general dissemination in these same public areas.

secure area surveillance data: Data collected from surveillance systems used to monitor secure areas. Includes video, audio, and other security sensor outputs.

signal control data: Information used to configure and control traffic signal systems.

signal control status: Status of surface street signal controls.

speed monitoring control: Information used to configure and control automated speed monitoring, speed warning, and speed enforcement systems.

speed monitoring information: System status including current operational state and logged information including measured speeds, warning messages displayed, and violation records.

suggested route: Suggested route for a dispatched emergency or maintenance vehicle that may reflect current network conditions and the additional routing options available to en route emergency or maintenance vehicles that are not available to the general public.

tag data: Unique tag ID and related vehicle information.

tax filing: Commercial vehicle tax filing data. Authorization for payment is included.

threat information coordination: Sensor, surveillance, and threat data including raw and processed data that is collected by sensor and surveillance equipment located in secure areas.

toll instructions: Demand management toll pricing information based on current congestion.
**toll transactions**: Detailed list of transactions from a toll station.

**traffic archive data**: Information describing the use and vehicle composition on transportation facilities and the traffic control strategies employed. Content may include a catalog of available information, the actual information to be archived, and associated meta data.

**traffic control coordination**: Information transfers that enable remote monitoring and control of traffic management devices. This flow is intended to allow cooperative access to, and control of, field equipment during incidents and special events and during day-to-day operations.

**traffic flow**: Raw and/or processed traffic detector data which allows derivation of traffic flow variables (e.g., speed, volume, and density measures) and associated information (e.g., congestion, potential incidents).

**traffic images**: High fidelity, real-time traffic images suitable for surveillance monitoring by the operator or for use in machine vision applications. This flow includes the images and the operational status of the surveillance system.

**traffic information coordination**: Traffic information exchanged between TMC’s. Normally would include incidents, congestion data, traffic data, signal timing plans, and real-time signal control information.

**transit archive data**: Data used to describe and monitor transit demand, fares, operations, and system performance. Content may include a catalog of available information, the actual information to be archived, and associated meta data that describes the archived information.

**transit emergency coordination data**: Data exchanged between centers dealing with a transit-related incident.

**transit emergency data**: Initial notification of transit emergency at a transit stop or on transit vehicles and further coordination as additional details become available and the response is coordinated.

**transit incident information**: Information on transit incidents that impact transit services for public dissemination.

**transit incidents for media**: Report of an incident impacting transit operations for public dissemination through the media.

**transit information for media**: Report of transit schedule deviations for public dissemination through the media.

**transit information request**: Request for transit operations information including schedule and fare information. The request can be a subscription that initiates as-needed information updates as well as a one-time request for information.
transit information user request: Request for special transit routing, real-time schedule information, and availability information.

transit request confirmation: Confirmation of a request for transit information or service.

transit schedule information: Current and projected transit schedule adherence.

transit traveler information: Transit information prepared to support transit users and other travelers. It contains transit schedules, real-time arrival information, fare schedules, and general transit service information.

transit vehicle location data: Current transit vehicle location and related operational conditions data provided by a transit vehicle.

transit vehicle passenger and use data: Data collected on board the transit vehicle pertaining to availability and/or passenger count.

transit vehicle schedule performance: Estimated times of arrival and anticipated schedule deviations reported by a transit vehicle.

traveler information: Traveler information comprised of traffic status, advisories, incidents, payment information and many other travel-related data updates and confirmations.

traveler information for media: General traveler information regarding incidents, unusual traffic conditions, transit issues, or other advisory information that has been desensitized and provided to the media.

traveler request: Request by a traveler to summon assistance, request information, make a reservation, or initiate any other traveler service.

trip identification number: The unique trip load number for a specific cross-border shipment.

trip log: Driver's daily log, vehicle location, mileage, and trip activity (includes screening, inspection and border clearance event data as well as fare payments).

trip log request: Request for trip log.

vehicle probe data: Vehicle probe data indicating identity, route segment identity, link time and location.

video surveillance control: Information used to configure and control video surveillance systems.

violation notification: Notification to enforcement agency of a violation. The violation notification flow describes the statute or regulation that was violated and how it was violated.
weather information: Accumulated forecasted and current weather data (e.g., temperature, pressure, wind speed, wind direction, humidity, precipitation, visibility, light conditions, etc.).

work plan coordination: Coordination of work plan schedules and activities between maintenance and construction organizations or systems. This information includes the work plan schedules and comments and suggested changes that are exchanged as work plans are coordinated.

work plan feedback: Comments and suggested changes to proposed construction and maintenance work schedules and activities. This information influences work plan schedules so that they minimize impact to other system operations and the overall transportation system.

work zone information: Summary of maintenance and construction work zone activities affecting the road network including the nature of the maintenance or construction activity, location, impact to the roadway, expected time(s) and duration of impact, anticipated delays.

work zone status: Current work zone status including current location (and future locations for moving work zones), impact to the roadway, required lane shifts, expected time(s) and duration of impact, anticipated delays, alternate routes, and suggested speed limits.

work zone warning status: Status of a work zone safety monitoring and warning devices. This flow documents system activations and includes additional supporting information (e.g., an image) that allows verification of the alarm.
Appendix E: Interconnect Diagrams
Advanced Traffic Laboratory for Automated Systems (ATLAS) Interconnect Diagram

Penn State University (PTI)
Advanced Traffic Laboratory for Automated Systems (ATLAS)

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Planned

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)
Penn State University (PTI)
Advanced Traffic Laboratory for Automated Systems (ATLAS)

data collection and monitoring control
roadside archive data

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)

Planned
Advanced Traveler Information and Resource Center (ATIRC) Interconnect Diagram

- Rail Operators
  - Rail Operation Centers

- PennDOT Central-Bureau of Maintenance
  - PennDOT BOMO Traffic Control Center (TCC)

- Concierge Service Provider
  - Concierge Service Center

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- North Central Pennsylvania Regional
  - Mapping, Addressing, and Internet Mapping

- PennDOT Central-Bureau of Highways
  - Advanced Traveler Information and Resource Center (ATIRC)

- Local Media
  - Newspaper, Radio, Television Stations

- PennDOT Engineering District 9-0
  - PennDOT 9-0 TMC

- Archived Data Users
  - Archived Data User System

- PA Emergency Management Agency
  - PA Emergency Management Agency (PEMA)

- PennDOT Central - Bureau of Planning
  - PennDOT Central Traffic Analysis Unit Center

- Pennsylvania State Police (PSP)
  - Pennsylvania State Police Highway Dispatch Center

- County Emergency Communications Coordination

- Weather Information Service Providers
  - Weather Information Service

- PennDOT Engineering Districts 1-0
  - PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

- PennDOT Central-Bureau of Highways
  - PennDOT Central Crash Information System and Analysis

Planned
PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

← weather archive data
archive requests
archive status

Weather Information Service Providers
Weather Information Service

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

**PennDOT Central-Bureau of Highway...**
Advanced Traveler Information and Resource Center (ATIRC)

- Archive analysis requests
- Archived data product requests
- Archive analysis results
- Archive request confirmation
- Archived data products

**Archived Data Users**
Archived Data User System

_________________________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Central-Bureau of Highwa...
Advanced Traveler Information and Resource Center (ATIRC)

- road network conditions
- traffic archive data
- traffic control coordination
- archive requests
- archive status
- traffic information coordination

County Emergency Communications ...
Clinton County 911 - RR Operations Coordination

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- archive requests
- archive status
- road network conditions
- fare and price information
- traveler archive data
- ISP coordination

PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

Planned
North Central Pennsylvania Regional ... Mapping, Addressing, and Internet Mapping

- map update request
- map updates

PennDOT Central-Bureau of Highway... Advanced Traveler Information and Resource Center (ATIRC)

------------------- Planned
PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

- external reports
- traveler information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

traffic control coordination
traffic information coordination

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Central-Bureau of Highwa...
Advanced Traveler Information and Resource Center (ATIRC)

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Advanced Traveler Information and Resource Center (ATIRC)

PennDOT Central-Bureau of Highway

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- archive requests
- archive status
- road network conditions
- traffic archive data
- traffic control coordination
- traffic information coordination

Planned
PennDOT Central-Bureau of Highwa... Advanced Traveler Information and Resource Center (ATIRC)

Planned

PennDOT Central-Bureau of Highwa... PennDOT Central Crash Information System and Analysis

archive requests
archive status
traffic archive data
traveler archive data
archive coordination
PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

- archive requests
- archive status
- traffic archive data
- traveler archive data
- archive coordination

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

Planned
PennDOT Central-Bureau of Highwa...
Advanced Traveler Information and Resource Center (ATIRC)

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Planned
PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

railroad advisories
railroad schedules
hri advisories

Rail Operators
Rail Operation Centers

Planned
Aero Medical Transport Services Interconnect Diagram

- Local EMS Responders
  - Local EMS Vehicles

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- Aero Medical Transport Service Provider
  - Aero Medical Transport Services

Planned
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

- resource deployment status
- incident information

Aero Medical Transport Service Providers

Aero Medical Transport Services

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Aero Medical Transport Services

- incident status
- emergency dispatch requests

Local EMS Responders

Local EMS Vehicles

Planned
Amtrak Passenger Train Terminal (Altoona) Interconnect Diagram

Concierge Service Provider
Concierge Service Center

Amtrak
Amtrak Passenger Train Terminal (Altoona)

Planned
Concierge Service Provider
Concierge Service Center

Amtrak
Amtrak Passenger Train Terminal (Altoona)

multimodal information
multimodal information request

Planned
Amtrak Passenger Train Terminal (Lewistown) Interconnect Diagram

- **Mifflin-Juniata Area Agency on Aging, Transit Center**
- **Centre Area Transportation Authority, CATA Bus Operations Center**
- **Amtrak, Amtrak Passenger Train Terminal (Lewistown)**
- **Concierge Service Provider, Concierge Service Center**

Planned connections between the aforementioned entities.
Amtrak
Amtrak Passenger Train Terminal
(Lewistown)

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging
Transit Center

planned

transit multimodal information
multimodal service data
Centre Area Transportation Authority ...
CATA Bus Operations Center

multimodal service data
transit multimodal information

Amtrak
Amtrak Passenger Train Terminal (Lewistown)

Planned
Concierge Service Provider
Concierge Service Center

Amtrak Passenger Train Terminal (Lewistown)

Planned
AMTRAN Bus Operation Center Interconnect Diagram

- **Regional MPO/LDD**
  - Regional Transportation Planning and Development Programs
- **AMTRAN**
  - AMTRAN Bus Operation Center
- **Archived Data Users**
  - Archived Data User System
- **Local School Districts**
  - Local School District Transportation Dispatch
- **Local Media**
  - Newspaper, Radio, Television Stations
- **Local Airport Management (Private a...**
  - Local Airports
- **Travelers**
  - User Personal Computing Devices
- **AMTRAN**
  - AMTRAN Transit Vehicles
- **Other Parking System Operators**
  - Other Parking Management Systems in the Study Area
- **Concierge Service Provider**
  - Concierge Service Center
- **Financial Institutions**
  - Financial Institutions
- **PennDOT Engineering District 9-0**
  - PennDOT 9-0 TMC
- **PennDOT Engineering District 2-0**
  - PennDOT 2-0 TMC

Planned
AMTRAN
AMTRAN Bus Operation Center

- alarm notification
- demand response passenger and use data
- fare collection data
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

AMTRAN
AMTRAN Transit Vehicles

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Archived Data Users
Archived Data User System

AMTRAN
AMTRAN Bus Operation Center

- traffic control priority request
- transit archive data
- transit demand management response
- transit probe data
- transit system data
- archive requests
- archive status
- request transit information
- road network conditions
- traffic control priority status
- transit demand management request

Planned
AMTRAN
AMTRAN Bus Operation Center

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Blair County 911 Center

Planned
Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

AMTRAN
AMTRAN Bus Operation Center

--- Planned
AMTRAN
AMTRAN Bus Operation Center

Financial Institutions

^ payment request
^ transaction status

------------------------ Planned
Local Airport Management (Private airports)

Local Airports

- transit multimodal information
- multimodal service data

AMTRAN
AMTRAN Bus Operation Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local School Districts
Local School District Transportation
Dispatch

- transit service coordination
- transit traveler information coordination

AMTRAN
AMTRAN Bus Operation Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Media
Newspaper, Radio, Television Stations

AMTRAN
AMTRAN Bus Operation Center

↑ transit information for media

Planned
Other Parking System Operators
Other Parking Management Systems in the Study Area

parking information

AMTRAN
AMTRAN Bus Operation Center

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

AMTRAN
AMTRAN Bus Operation Center

- Traffic control priority request
- Transit demand management response
- Transit probe data
- Transit system data
- Request transit information
- Road network conditions
- Traffic control priority status
- Transit demand management request

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- transit demand management response
- transit system data
- request transit information
- road network conditions
- transit demand management request

AMTRAN
AMTRAN Bus Operation Center

Planned
Regional MPO/LDD
Regional Transportation Planning and Development Programs

- transit archive data
- archive requests
- archive status

AMTRAN
AMTRAN Bus Operation Center

Planned
AMTRAN Transit Vehicles Interconnect Diagram

AMTRAN
AMTRAN Bus Operation Center

AMTRAN
AMTRAN Transit Vehicles

Planned
Archived Data User System Interconnect Diagram

Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Archived Data User System

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<th>Region C</th>
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<td>ATIRC (Advanced Traveler Information and Resource Center)</td>
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<td>PennDOT 9-0 TMC</td>
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<td>Centre Area Transportation Authority</td>
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<td>Regional Transportation Planning and Development Programs</td>
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<td>Centre County Paratransit Services Center</td>
<td>Regional Emergency Medical Services Coordination</td>
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<td>Centre County Office of Transportation</td>
<td>Planned</td>
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<td>Center for Transportation Systems (CITranS)</td>
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Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Penn State University (PTI)
Transportation Research and Education Programs

Planned
Archived Data Users
Archived Data User System

- emergency archive data
- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- archive requests
- archive status
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

County Emergency Communications ...
Blair County 911 Center

Planned
Archived Data Users
Archived Data User System
Archived Data Users

Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

--- Planned

Penn State University (PTI)

Center for Intelligence Transportation Systems (CITranS)
Archived Data Users
Archived Data User System

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

_________________________ Planned
Archived Data Users
Archived Data User System

Centre County Office of Transportation... Centre County Paratransit Services Center

- Traffic control priority request
- Transit archive data
- Transit demand management response
- Transit probe data
- Transit system data
- Archive requests
- Archive status
- Request transit information
- Road network conditions
- Traffic control priority status
- Transit demand management request

Planned
Archived Data Users
Archived Data User System

Local County Planning Commissions
County Planning Commission

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Planned
Financial Institutions

Archived Data Users

- payment request
- transaction status

Archived Data User System

Planned
Archived Data Users
Archived Data User System

traffic control coordination
traffic information coordination

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

Planned
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

Archived Data Users

Archived Data User System

Regional ITS Architecture

PennDOT District 2-0 ITS Architecture Region

Planned
Archived Data Users
Archived Data User System

PennDOT Central-Bureau of Mainten...
PennDOT BOMO Traffic Control Center (TCC)

Planned
Archived Data Users
Archived Data User System

- Archive analysis results
- Archive request confirmation
- Archived data products
- Archive analysis requests
- Archived data product requests

PennDOT Central-Bureau of Highwa...
PennDOT Central Crash Information System and Analysis

Planned
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- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

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**PennDOT Central - Bureau of Planning...**

**PennDOT Central Traffic Analysis Unit Center**

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Planned
Archived Data Users
Archived Data User System

Regional EMS Councils
Regional Emergency Medical Services Coordination

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Planned
Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
PennDOT Central-Bureau of Highways... Advanced Traveler Information and Resource Center (ATIRC)

- archive analysis requests
- archived data product requests
- archive analysis results
- archive request confirmation
- archived data products

Archived Data Users
Archived Data User System

Planned
ATA Transit Operations Center Interconnect Diagram

Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center_Kiosks

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Concierge Service Provider
Concierge Service Center

Area Transportation Authority of Northern Pennsylvania
ATA Transit Vehicles

DuBois, Falls Creek, Sandy Township:
DuFAST Transit Office Kiosks

North Central Pennsylvania Regional
Mapping, Addressing, and Internet Mapping

Financial Institutions
Financial Institutions

Local Media
Newspaper, Radio, Television Stations

Users
User Personal Computing Devices

Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

DuBois, Falls Creek, Sandy Township:
DuFAST Web Page

Local School Districts
Local School District Transportation Dispatch

Archived Data Users
Archived Data User System

Local County Emergency Management
Local County Emergency Management Agencies

Regional MPO/LODO
Regional Transportation Planning and Development Programs

Local Airport Management (Private and Public)
Local Airports

Regional Transportation Planning and Development Programs
Regional Transportation Planning and Development Programs

Automated Vehicle Location (AVL) Systems

Travelers

User Personal Computing Devices

Area Transportation Authority of Northern Pennsylvania
ATA Web Page

Other Parking System Operators
Other Parking Management Systems in the Study Area

Financial Institutions
Financial Institutions

Local Media
Newspaper, Radio, Television Stations

Users
User Personal Computing Devices

Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

DuBois, Falls Creek, Sandy Township:
DuFAST Web Page

Local School Districts
Local School District Transportation Dispatch

Archived Data Users
Archived Data User System

Local County Emergency Management
Local County Emergency Management Agencies

Regional MPO/LODO
Regional Transportation Planning and Development Programs

Local Airport Management (Private and Public)
Local Airports

Regional Transportation Planning and Development Programs
Regional Transportation Planning and Development Programs

Archived Data Users
Archived Data User System

Local County Emergency Management
Local County Emergency Management Agencies

Regional MPO/LODO
Regional Transportation Planning and Development Programs

Local Airport Management (Private and Public)
Local Airports

Regional Transportation Planning and Development Programs
Regional Transportation Planning and Development Programs
Area Transportation Authority of Nort...
ATA Transit Operations Center

Weather Information Service Providers
Weather Information Service

weather information

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

Archived Data Users
Archived Data User System

- archive requests
- archive status
- request transit information
- road network conditions
- traffic control priority status
- transit demand management request
- traffic control priority request
- transit archive data
- transit demand management response
- transit probe data
- transit system data

Planned
Area Transportation Authority of North...  
ATA Transit Operations Center

emergency notification  
secure area surveillance data  
transit fare and passenger status  
transit information user request  
emergency acknowledge  
secure area surveillance control  
transit fare information  
transit traveler information

Area Transportation Authority of North...  
ATA Transit Operations Center_Kiosks

------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of Nort...
ATA Transit Operations Center

- alarm notification
- demand response passenger and use data
- fare collection data
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

Area Transportation Authority of Nort...
ATA Transit Vehicles

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

Area Transportation Authority of Nort...
ATA Web Page

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of North Central Pennsylvania
ATA Transit Operations Center

- alarm notification
- fare collection data
- request for bad tag list
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- fare management information
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

North Central Pennsylvania Regional... Automated Vehicle Location (AVL) Systems

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

**Concierge Service Provider**
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

**Area Transportation Authority of North...**
ATA Transit Operations Center

Planned
Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

transaction status
payment request

Financial Institutions

Financial Institutions

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

- Incident information
- Incident response status
- Transit emergency data

County Emergency Communications...
Local 911 Centers

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of Nort... 
ATA Transit Operations Center

multimodal service data
transit multimodal information

Local Airport Management (Private a... 
Local Airports

Planned
Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

Local County Emergency Management Agencies

incident information
incident response status
transit emergency data

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

transit service coordination
transit traveler information coordination

Local School Districts
Local School District Transportation Dispatch

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of North...
ATA Transit Operations Center

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

------------------- Planned
Area Transportation Authority of Nort...
  ATA Transit Operations Center

parking information

Other Parking System Operators
  Other Parking Management Systems in the Study Area

Planned
Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of North...
ATA Transit Operations Center

- archive requests
- archive status
- transit archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
Travelers
User Personal Computing Devices

Area Transportation Authority of Nort...
ATA Transit Operations Center

个人交通信息
交通信息用户请求

---------------------
Planned
ATA Transit Operations Center Kiosks Interconnect Diagram

Area Transportation Authority of Nort... ATA Transit Operations Center

Area Transportation Authority of Nort... ATA Transit Operations Center_Kiosks

______________________________ Planned
Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

Planned
ATA Transit Vehicles Interconnect Diagram

Area Transportation Authority of Northern... ATA Transit Operations Center

__________________________ Planned

Area Transportation Authority of Northern... ATA Transit Vehicles
Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Area Transportation Authority of Norton...
ATA Web Page

____________________ Planned
Area Transportation Authority of North...  
ATA Transit Operations Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

Area Transportation Authority of North...  
ATA Web Page

_________________________  Planned
Automated Vehicle Location (AVL) Systems Interconnect Diagram

DuBois, Falls Creek, Sandy Township...
   DuFAST Transit Office

Area Transportation Authority of North...
   ATA Transit Operations Center

North Central Pennsylvania Regional...
   Automated Vehicle Location (AVL) Systems

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- alarm notification
- demand response passenger and use data
- fare collection data
- request for bad tag list
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- fare management information
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

North Central Pennsylvania Regional ...
Automated Vehicle Location (AVL) Systems

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of Nort...
ATA Transit Operations Center

- alarm notification
- demand response passenger and use data
- fare collection data
- request for bad tag list
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- fare management information
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

North Central Pennsylvania Regional ... Automated Vehicle Location (AVL) Systems

Planned
Weather Information Service Providers
Weather Information Service

weather information

County Emergency Communications ...
Blair County 911 Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

↑ incident information

County Emergency Communications ...
Blair County 911 Center

______________ Planned
Local County Planning Commissions

County Planning Commission

- emergency archive data
- archive requests
- archive status

County Emergency Communications ...
Blair County 911 Center

____________________ Planned
HAZMAT Response Teams
HAZMAT Cleanup Vehicles

emergency dispatch requests
incident status

County Emergency Communications ...
Blair County 911 Center

Planned
Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

incident report
incident response coordination
resource coordination

County Emergency Communications ...
Blair County 911 Center

Planned
Local EMS Responders
Local EMS Vehicles

emergency dispatch requests
incident status

County Emergency Communications ...
Blair County 911 Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Fire Companies
Local Fire Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Blair County 911 Center

______________________ Planned
Local Police Departments

Local Police Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...

Blair County 911 Center

------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local School Districts
Local School District Transportation Dispatch

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Blair County 911 Center

__________________________  Planned
North Central Pennsylvania Regional ...  
Mapping, Addressing, and Internet Mapping

map update request
map updates

County Emergency Communications ...  
Blair County 911 Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Media
Newspaper, Radio, Television Stations

incident information for media

County Emergency Communications ...
Blair County 911 Center

Planned
PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

incident report
incident response coordination
resource coordination

County Emergency Communications ...
Blair County 911 Center

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

emergency traffic control request
incident response status
remote surveillance control
resource request
emergency traffic control information
resource deployment status
road network conditions
traffic images
incident information

County Emergency Communications ...
Blair County 911 Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications ...
Blair County 911 Center

- alarm notification
- secure area sensor data
- secure area surveillance data
- alarm acknowledge
- secure area sensor control
- secure area surveillance control

PennDOT Engineering District 9-0
PennDOT 9-0 Traffic Section Kiosks

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

Emergency dispatch requests
Incident status

County Emergency Communications...
Blair County 911 Center

Planned
Regional EMS Councils
Regional Emergency Medical Services Coordination

Emergency archive data
Archive requests
Archive status
Incident report
Incident response coordination
Resource coordination

County Emergency Communications ...
Blair County 911 Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Bureau of State Parks
State and National Parks

\[ \text{event confirmation} \]
\[ \text{event plans} \]

County Emergency Communications ...
Blair County 911 Center

Planned
Towing Companies
Tow Dispatch Vehicles

County Emergency Communications ...
Blair County 911 Center

emergency dispatch requests
incident status

Planned
Travelers
User Personal Computing Devices

- emergency acknowledge
- emergency notification

County Emergency Communications ...
Blair County 911 Center

------------------ Planned
Archived Data Users
Archived Data User System

- emergency archive data
- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- archive requests
- archive status
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

County Emergency Communications ...
Blair County 911 Center

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

Weather Information Service Providers
Weather Information Service

weather information

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

- emergency notification
- secure area surveillance data
- transit fare and passenger status
- transit information user request
- emergency acknowledge
- secure area surveillance control
- transit fare information
- transit traveler information

Centre Area Transportation Authority ...
CATA Bus Operations Center_Kiosks

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...

CATA Bus Operations Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

Centre Area Transportation Authority ...

CATA Web Page

___________________________________________ Planned
Centre Area Transportation Authority ...
    CATA Bus Operations Center

- transit service coordination
- transit traveler information coordination

Centre County Office of Transportation...
    Centre County Paratransit Services Center

_________________________ Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

Concierge Service Provider
Concierge Service Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

Transaction status
Payment request

Financial Institutions
Financial Institutions

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ... CATA Bus Operations Center

- incident information
- incident response status
- transit emergency data

County Emergency Communications ... Local 911 Centers

___________________________ Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

multimodal service data
transit multimodal information

Local Airport Management (Private a...
Local Airports

_________________________ Planned
Centre Area Transportation Authority...
CATA Bus Operations Center

Local County Emergency Management...
Local County Emergency Management Agencies

incident information
incident response status
transit emergency data

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

- transit service coordination
- transit traveler information coordination

Local School Districts
Local School District Transportation Dispatch

Planned
Centre Area Transportation Authority ...
  CATA Bus Operations Center

Mifflin-Juniata Area Agency on Aging,...
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority...
CATA Bus Operations Center

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Other Parking System Operators
Other Parking Management Systems in the Study Area

parking information

Centre Area Transportation Authority ...
CATA Bus Operations Center

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

parking information

Penn State University Athletics
PSU Athletic Sports Information Office

Planned
Centre Area Transportation Authority ... CATA Bus Operations Center

transit service coordination
transit traveler information coordination

Penn State University-Department of ... PSUTS Fleet Operations

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

Parking information

Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Planned
Regional ITS Architecture

PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

- request transit information
- road network conditions
- traffic control priority status
- transit demand management request
- traffic control priority request
- transit demand management response
- transit system data

Penn State University-Department of ...
PSUTS TMC

__________________________  Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

↑ parking information

University Park Airport Management
University Park Airport Parking

__________________________ Planned
Centre Area Transportation Authority ... CATA Bus Operations Center

transit information user request
personal transit information

Travelers
User Personal Computing Devices

-------------------------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

Archived Data Users
Archived Data User System

Planned
Centre Area Transportation Authority ...

CATA Bus Operations Center

Amtrak

Amtrak Passenger Train Terminal (Lewistown)

multimodal service data
transit multimodal information

Planned
CATA Bus Operations Center Kiosks Interconnect Diagram

Centre Area Transportation Authority ...
CATA Bus Operations Center

-----------------------  Planned

Centre Area Transportation Authority ...
CATA Bus Operations Center_Kiosks
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority...
CATA Bus Operations Center

- emergency notification
- secure area surveillance data
- transit fare and passenger status
- transit information user request
- emergency acknowledge
- secure area surveillance control
- transit fare information
- transit traveler information

Planned
CATA Transit Vehicles Interconnect Diagram

Centre Area Transportation Authority ...
CATA Bus Operations Center

Centre Area Transportation Authority ...
CATA Transit Vehicles

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

- alarm notification
- demand response passenger and use data
- fare collection data
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

Centre Area Transportation Authority ...
CATA Transit Vehicles

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

CATA Web Page Interconnect Diagram

Travelers
User Personal Computing Devices

Centre Area Transportation Authority ...
CATA Bus Operations Center

Centre Area Transportation Authority ...
CATA Web Page

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Centre Area Transportation Authority ...
CATA Web Page

_____________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

Centre Area Transportation Authority ...
CATA Web Page

Planned
Center for Intelligence Transportation Systems (CITranS) Interconnect Diagram

- Penn State University (PTI)
  - PSU Field Sensors

- Archived Data Users
  - Archived Data User System

- Center for Intelligence Transportation Systems (CITranS)

- Penn State University (PTI)
  - Transportation Research and Education Programs

Planned
Penn State University (PTI)
Transportation Research and Education Programs

---

Planned

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITranS)

- archive requests
- archive status
- other data source archive data
- archive coordination
Penn State University (PTI)
PSU Field Sensors

_data collection and monitoring control_
_roadside archive data_

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITransS)

Planned
Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITranS)

Planned
Center for Traffic Operational Analysis (CTA) Interconnect Diagram

- Penn State University (PTI) - Advanced Traffic Laboratory for Automated Systems (ATLAS)
- Penn State University (PTI) - Transportation Research and Education Programs
- Archived Data Users - Archived Data User System
- Planned

- Penn State University (PTI) - Center for Traffic Operational Analysis (CTA)
Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)

Planned
Penn State University (PTI)
Advanced Traffic Laboratory for Automated Systems (ATLAS)

data collection and monitoring control
roadside archive data

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)

Planned
Penn State University (PTI)
Transportation Research and Education Programs

- archive requests
- archive status
- other data source archive data
- archive coordination

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Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)

Planned
Centre County Paratransit Services Center Interconnect Diagram
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Archived Data Users
Archived Data User System

- traffic control priority request
- transit archive data
- transit demand management response
- transit probe data
- transit system data
- archive requests
- archive status
- request transit information
- road network conditions
- traffic control priority status
- transit demand management request

Centre County Office of Transportation...
Centre County Paratransit Services Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Weather Information Service Providers

- Weather Information Service

---

Centre County Office of Transportation...

- Centre County Paratransit Services Center

---

weather information

---

Planned
Centre County Office of Transportation... Centre County Paratransit Services Center

- demand response passenger and use data
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- transit vehicle operator information

Centre County Office of Transportation... Centre County Paratransit Vehicles

______________  Planned
Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

Centre County Office of Transportation...
Centre County Paratransit Services Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications ...
Local 911 Centers

↑ transit emergency data
incident information
incident response status

Centre County Office of Transportation...
Centre County Paratransit Services Center

______________________  Planned
Local County Emergency Management Agencies

- Transit emergency data
- Incident information
- Incident response status

Centre County Office of Transportation
Centre County Paratransit Services Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre County Office of Transportation...
Centre County Paratransit Services Center

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging Transit Center

transit service coordination
transit traveler information coordination

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Media
Newspaper, Radio, Television Stations

transit incidents for media
transit information for media

Centre County Office of Transportation
Centre County Paratransit Services Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Travelers
User Personal Computing Devices

Centre County Office of Transportation...
Centre County Paratransit Services Center

personal transit information
transit information user request

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority...
CATA Bus Operations Center

transit service coordination
transit traveler information coordination

Centre County Office of Transportation...
Centre County Paratransit Services Center

Planned
Centre County Paratransit Vehicles Interconnect Diagram

Centre County Office of Transportation...
Centre County Paratransit Services Center

Centre County Office of Transportation...
Centre County Paratransit Vehicles

Planned
Centre County Office of Transportation...
Centre County Paratransit Services Center

- Demand response passenger and use data
- Transit vehicle loading data
- Transit vehicle location data
- Transit vehicle schedule performance
- Transit vehicle operator information

Planned

Centre County Office of Transportation...
Centre County Paratransit Vehicles
Clinton County 911- RR Operations Coordination Interconnect Diagram

Local Municipalities in Study Area
- Local Traffic Signal Control Systems

County Emergency Communications...
- Local 911 Centers

Rail Operators
- Rail Operation Centers

County Emergency Communications...
- Clinton County 911 - RR Operations Coordination

Rail Operators
- Rail Operation Centers

PennDOT Central-Bureau of Highway...
- Advanced Traveler Information and Resource Center (ATIRC)

PennDOT Engineering District 2-0
- PennDOT 2-0 TMC

Planned
County Emergency Communications ...
Local 911 Centers

- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- incident information

Planned

Clinton County 911 - RR Operations Coordination
Local Municipalities in Study Area
Local Traffic Signal Control Systems

Traffic control coordination
Traffic information coordination

County Emergency Communications ...
Clinton County 911 - RR Operations
Coordination

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

traffic control coordination
traffic information coordination

County Emergency Communications ...
Clinton County 911 - RR Operations Coordination

--------------------------- Planned
Commercial Vehicle Interconnect Diagram

- **PennDOT Engineering District 2-0**
  - I-99 Weigh-In-Motion (WIM) Station

- **Local Fleet and Freight Management**
  - Local Fleet and Freight Management Systems

- **Commercial Vehicle Fleet Operators**
  - Commercial Vehicle Fleet Info. Systems

- **Planned**

- **Commercial Vehicle Fleet Operators**
  - Commercial Vehicle
Commercial Vehicle Fleet Operators

Commercial Vehicle

- broadcast traveler information
- interactive traveler information
- trip plan
- yellow pages information
- traffic probe data
- traveler profile
- traveler request
- trip confirmation
- trip request
- yellow pages request

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Commercial Vehicle Fleet Operators
Commercial Vehicle

- border clearance event
- electronic lock data request
- electronic screening request
- on-board safety request
- pass/pull-in
- safety inspection record
- electronic lock data
- on-board safety data
- screening event record

PennDOT Engineering District 2-0
I-99 Weigh-In-Motion (WIM) Station

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Commercial Vehicle Fleet Operators

Commercial Vehicle

- fleet to driver update
- driver to fleet request
- on-board vehicle data

Local Fleet and Freight Management...

Local Fleet and Freight Management Systems

Planned
Commercial Vehicle Fleet Info Systems Interconnect Diagram

- Local Fleet and Freight Management Systems
- County Emergency Communications
- HAZMAT Response Teams
- Commercial Vehicle Fleet Operators
- PennDOT Engineering District 2-0
- Planned

- Local Fleet and Freight Management Systems
- Local 911 Centers
- HAZMAT Cleanup
- Commercial Vehicle Fleet Info. Systems
- Commercial Vehicle
- PennDOT 2-0 TMC
Commercial Vehicle Fleet Operators

- broadcast traveler information
- interactive traveler information
- trip plan
- yellow pages information
- traffic probe data
- traveler profile
- traveler request
- trip confirmation
- trip request
- yellow pages request

Commercial Vehicle Fleet Info. Systems

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

HAZMAT Response Teams
HAZMAT Cleanup

Commercial Vehicle Fleet Operators
Commercial Vehicle Fleet Info. Systems

incident information

Planned
Commercial Vehicle Fleet Operators
- Commercial Vehicle Fleet Info. Systems

incident information

County Emergency Communications ...
- Local 911 Centers

Planned
Commercial Vehicle Fleet Operators
Commercial Vehicle Fleet Info. Systems

Local Fleet and Freight Management ...
Local Fleet and Freight Management Systems

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Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Commercial Vehicle Fleet Operators
Commercial Vehicle Fleet Info. Systems

Planned
Concierge Service Provider
Concierge Service Center

weather information

Weather Information Service Providers
Weather Information Service

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

DuBois, Falls Creek, Sandy Townshi...
DuFAST Transit Office

Planned
Concierge Service Provider
Concierge Service Center

- transaction status
- payment request

Financial Institutions

Planned
Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- multimodal information
- transit and fare schedules
- transit incident information
- transit request confirmation
- transit information request

Private Sector Inter-City Bus Company...
Inter-City Bus Services

Planned
Concierge Service Provider
Concierge Service Center

↑ incident information

County Emergency Communications ...
Local 911 Centers

Planned
Concierge Service Provider
Concierge Service Center

multimodal information
multimodal information request

Local Airport Management (Private a...)
Local Airports

Planned
Concierge Service Provider
Concierge Service Center

Local County Emergency Management...
Local County Emergency Management Agencies

incident information

Planned
Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging Transit Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

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Concierge Service Provider
Concierge Service Center

- external reports
- traveler information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

Other Parking System Operators
Other Parking Management Systems in the Study Area

Planned
<table>
<thead>
<tr>
<th>Concierge Service Provider</th>
</tr>
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<tbody>
<tr>
<td>Concierge Service Center</td>
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</tbody>
</table>

- Road network conditions

<table>
<thead>
<tr>
<th>PennDOT Engineering District 2-0</th>
</tr>
</thead>
<tbody>
<tr>
<td>PennDOT 2-0 TMC</td>
</tr>
</tbody>
</table>

Planned
Concierge Service Provider
Concierge Service Center

- traveler request
- trip confirmation
- trip request
- interactive traveler information
- trip plan

PennDOT Engineering District 2-0
PennDOT 2-0 Traffic Section Kiosks

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- fare and price information
- logged vehicle routes
- road network traffic probe data
- road network conditions

Concierge Service Provider
Concierge Service Center

Planned
Concierge Service Provider
Concierge Service Center

- trip confirmation
- trip request
- trip plan

PennDOT Engineering District 9-0
PennDOT 9-0 Traffic Section Kiosks

Planned
Concierge Service Provider
Concierge Service Center

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

incident information

Planned
Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Planned
Concierge Service Provider
Concierge Service Center

PSUTS Parking Office ISP

ISP coordination

Planned
Concierge Service Provider
Concierge Service Center

- trip confirmation
- trip request
- trip plan

Penn State University-Department of ...
PSUTS Parking Office Kiosks

__________________________ Planned
Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

State College Borough
State College Borough Parking System

Planned
Concierge Service Provider
Concierge Service Center

Convention and Visitors Bureaus
Tourists Information Services

- travel service information
- travel service reservations
- travel service information request
- travel service reservation request

Planned
Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

University Park Airport Management
University Park Airport Parking

Planned
Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Concierge Service Provider
Concierge Service Center

_________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

Centre County Office of Transportation...
Centre County Paratransit Services Center

- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- archive requests
- archive status
- road network conditions
- fare and price information
- traveler archive data
- ISP coordination

PennDOT Central-Bureau of Highwa...
Advanced Traveler Information and Resource Center (ATIRC)

Planned
Concierge Service Provider
Concierge Service Center

- multimodal information
- multimodal information request

Amtrak
Amtrak Passenger Train Terminal (Altoona)

Planned
Concierge Service Provider

Concierge Service Center

Amtrak

Amtrak Passenger Train Terminal (Lewistown)

multimodal information
multimodal information request

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

Area Transportation Authority of Nort...
ATA Transit Operations Center

-------------------------------------------------- Planned
Concierge Service Provider
Concierge Service Center

\[\text{incident information}\]

County Emergency Communications ...
Blair County 911 Center

\[\text{Planned}\]
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

---

Concierge Service Provider
Concierge Service Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

---

Planned
County Planning Commission Interconnect Diagram
Archived Data Users
Archived Data User System

- Archive analysis results
- Archive request confirmation
- Archived data products
- Archive analysis requests
- Archived data product requests

Local County Planning Commissions
County Planning Commission

- Planned
Local County Planning Commissions
County Planning Commission

- Emergency archive data
- Archive requests
- Archive status

County Emergency Communications ...
Blair County 911 Center

__________________________ Planned
Local County Planning Commissions
County Planning Commission

- parking archive data
- archive requests
- archive status

University Park Airport Management
University Park Airport Parking

------------------------ Planned
Economic Development Organizations
Local Chambers of Commerce & Economic Development Organizations

- archive requests
- archive status
- other data source archive data

Local County Planning Commissions
County Planning Commission

________________________ Planned
Local County Planning Commissions

County Planning Commission

- emergency archive data
- archive requests
- archive status

Local County Emergency Management...

Local County Emergency Management Agencies

------------------- Planned
Local County Planning Commissions

County Planning Commission

- maint and constr archive data
- archive requests
- archive status

Local Municipalities in Study Area

Municipal Construction and Maintenance

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Penn State University-Department of ... PSUTS Parking Office and Event Coordinator

- archive requests
- archive status
- parking archive data

Local County Planning Commissions
County Planning Commission

-------------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

DuFAST Transit Office Interconnect Diagram

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- Local Media
  - Newspaper, Radio, Television Stations

- North Central Pennsylvania Regional...
  - Mapping, Addressing, and Internet Mapping

- Travelers
  - User Personal Computing Devices

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Transit Office Kiosks

- Concierge Service Provider
  - Concierge Service Center

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Transit Vehicles

- Local Airport Management (Private a...
  - Local Airports

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Web Page

- Regional MPO/LCD
  - Regional Transportation Planning and Development Programs

- Local County Emergency Management...
  - Local County Emergency Management Agencies

- Weather Information Service Providers
  - Weather Information Service

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Web Page

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Transit Office

- North Central Pennsylvania Regional...
  - Automated Vehicle Location (AVL) Systems

- County Emergency Communications...
  - Local 911 Centers

- Financial Institutions
  - Financial Institutions

- Local County Emergency Management...
  - Local County Emergency Management Agencies

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Transit Vehicles

- Regional MPO/LCD
  - Regional Transportation Planning and Development Programs

- Local County Emergency Management...
  - Local County Emergency Management Agencies

- Other Parking System Operators
  - Other Parking Management Systems in the Study Area

- Financial Institutions
  - Financial Institutions

- Planned
Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

DuBois, Falls Creek, Sandy Townshi...
DuFAST Transit Office

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

↑ weather information

Weather Information Service Providers
Weather Information Service

Planning
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- Emergency notification
- Secure area surveillance data
- Transit fare and passenger status
- Transit information user request
- Emergency acknowledge
- Secure area surveillance control
- Transit fare information
- Transit traveler information

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office Kiosks

Planned
DuBois, Falls Creek, Sandy Township...  
DuFAST Transit Office

- demand response passenger and use data
- fare collection data
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- bad tag list
- transit vehicle operator information

DuBois, Falls Creek, Sandy Township...  
DuFAST Transit Vehicles

------------------------- Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- Demand responsive transit request
- Selected routes
- Transit information request
- Demand responsive transit plan
- Transit and fare schedules
- Transit incident information
- Transit request confirmation

DuBois, Falls Creek, Sandy Township...
DuFAST Web Page

------------------------- Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- transaction status
- payment request

Financial Institutions

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Local 911 Centers

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Local Airport Management (Private a...
Local Airports

multimodal service data
transit multimodal information

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Local County Emergency Management...
Local County Emergency Management Agencies

- incident information
- incident response status
- transit emergency data

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Up
map updates
map update request

North Central Pennsylvania Regional...
Mapping, Addressing, and Internet Mapping

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

----------------------------------- Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

parking information

Other Parking System Operators
Other Parking Management Systems in the Study Area

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Regional MPO/LDD
Regional Transportation Planning and Development Programs

archive requests
archive status
transit archive data

Planned
Travelers
User Personal Computing Devices

- personal transit information
- transit information user request

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

North Central Pennsylvania Regional...
Automated Vehicle Location (AVL) Systems

- alarm notification
- demand response passenger and use data
- fare collection data
- request for bad tag list
- transit traveler request
- transit vehicle conditions
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- alarm acknowledge
- bad tag list
- fare management information
- request for vehicle measures
- transit schedule information
- transit traveler information
- transit vehicle operator information

Planned
DuFAST Transit Office Kiosks Interconnect Diagram

DuBois, Falls Creek, Sandy Township...
  DuFAST Transit Office

Area Transportation Authority of Northern Pennsylvania...
  ATA Transit Operations Center

DuBois, Falls Creek, Sandy Township...
  DuFAST Transit Office Kiosks

            Planned
DuBois, Falls Creek, Sandy Townsh... DuFAST Transit Office

DuBois, Falls Creek, Sandy Townsh... DuFAST Transit Office Kiosks

- emergency notification
- secure area surveillance data
- transit fare and passenger status
- transit information user request
- emergency acknowledge
- secure area surveillance control
- transit fare information
- transit traveler information

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

**Area Transportation Authority of Northern Pennsylvania**

ATA Transit Operations Center

- Emergency notification
- Secure area surveillance data
- Transit fare and passenger status
- Transit information user request
- Emergency acknowledge
- Secure area surveillance control
- Transit fare information
- Transit traveler information

**DuBois, Falls Creek, Sandy Township**

DuFAST Transit Office Kiosks

Planned
DuFAST Transit Vehicles Interconnect Diagram

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Vehicles

Planned
DuBois, Falls Creek, Sandy Township...

**DuFAST Transit Office**

- demand response passenger and use data
- fare collection data
- transit vehicle loading data
- transit vehicle location data
- transit vehicle schedule performance
- bad tag list
- transit vehicle operator information

**DuBois, Falls Creek, Sandy Township...**

**DuFAST Transit Vehicles**

Planned
DuFAST Web Page Interconnect Diagram

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Travelers
User Personal Computing Devices

DuBois, Falls Creek, Sandy Township...
DuFAST Web Page

Area Transportation Authority of North...
ATA Transit Operations Center

Planned
Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

DuBois, Falls Creek, Sandy Township
DuFAST Web Page

_________________________ Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

DuBois, Falls Creek, Sandy Township...
DuFAST Web Page

Planned
Travelers
User Personal Computing Devices

- Interactive traveler information
- Trip plan
- Yellow pages information
- Traveler request
- Trip confirmation
- Trip request
- Yellow pages request

DuBois, Falls Creek, Sandy Township...
DuFAST Web Page

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Financial Institutions Interconnect Diagram

- AMTRAN
  - AMTRAN Bus Operation Center

- Centre County Office of Transportation
  - Centre County Paratransit Services Center

- Financial Institutions

- Other Parking System Operators
  - Other Parking Management Systems in the Study Area

- State College Borough
  - State College Borough Parking System

- Mifflin-Juniata Area Agency on Aging
  - Mifflin-Juniata Area Agency on Aging Transit Center

- University Park Airport Management
  - University Park Airport Parking

- University Park Airport
  - University Park Airport Management
  - University Park Airport Parking

- DuBois, Falls Creek, Sandy Township
  - DuFAST Transit Office

- Centre Area Transportation Authority
  - CATA Bus Operations Center

- Area Transportation Authority of Northern Pennsylvania
  - ATA Transit Operations Center

- Archived Data Users
  - Archived Data User System

- Penn State University-Department of Transportation
  - PSUTS Parking Office and Event Coordinator

- Concierge Service Provider
  - Concierge Service Center

- Planned
DuBois, Falls Creek, Sandy Township...  
DuFAST Transit Office

- transaction status
- payment request

Financial Institutions

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Financial Institutions

<table>
<thead>
<tr>
<th>Financial Institutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>payment request</td>
</tr>
<tr>
<td>transaction status</td>
</tr>
</tbody>
</table>

AMTRAN

AMTRAN Bus Operation Center

Planned
Financial Institutions

Archived Data Users

payment request
transaction status

Archived Data User System

Planned
Area Transportation Authority of Northern Pennsylvania
ATA Transit Operations Center

Financial Institutions

(transaction status)
(payment request)

Planned
Centre Area Transportation Authority ... CATA Bus Operations Center

- transaction status
- payment request

Financial Institutions

Planned
Financial Institutions

centre Count

Office of Transportatio...n

Centre County Paratransit Services Center

payment request

transaction status

Planned
Concierge Service Provider

Concierge Service Center

--------------------- Planned

Financial Institutions

Financial Institutions

- Transaction status
- Payment request
Financial Institutions

payment request
transaction status

University Park Airport Management

University Park Airport Parking

______________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Financial Institutions

+++

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

Payment request
Transaction status

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Financial Institutions
Financial Institutions

payment request
transaction status

Other Parking System Operators
Other Parking Management Systems in the Study Area

Planned
HAZMAT Cleanup Interconnect Diagram

- Local HAZMAT Mitigation
  - HAZMAT Mitigation/Containment

- HAZMAT Response Teams
  - HAZMAT Cleanup

- Commercial Vehicle Fleet Operators
  - Commercial Vehicle Fleet Info. Systems

- Local County Emergency Management Agencies

- Pennsylvania State Police (PSP)
  - Pennsylvania State Police Highway Dispatch Center

- Weather Information Service Providers
  - Weather Information Service

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- PennDOT Engineering District 9-0
  - PennDOT 9-0 TMC

- Planned
HAZMAT Response Teams

HAZMAT Cleanup

incident information

Commercial Vehicle Fleet Operators

Commercial Vehicle Fleet Info. Systems

Planned
HAZMAT Response Teams
HAZMAT Cleanup

- incident status
- emergency dispatch requests

HAZMAT Response Teams
HAZMAT Cleanup Vehicles

______________ Planned
HAZMAT Response Teams

HAZMAT Cleanup

incident report
incident response coordination
resource coordination

Local HAZMAT Mitigation

HAZMAT Mitigation/Containment

Planned
HAZMAT Response Teams
HAZMAT Cleanup

Local County Emergency Management Agencies

- incident report
- incident response coordination
- resource coordination

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

HAZMAT Response Teams
HAZMAT Cleanup

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- incident report
- incident response coordination
- resource coordination

HAZMAT Response Teams
HAZMAT Cleanup

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Weather Information Service Providers
Weather Information Service

HAZMAT Response Teams
HAZMAT Cleanup

weather information

Planned
HAZMAT Cleanup Vehicles Interconnect Diagram

- County Emergency Communications ...
  - Blair County 911 Center

- Local Police Departments
  - Local Police Dispatch

- County Emergency Communications ...
  - Local 911 Centers

- HAZMAT Response Teams
  - HAZMAT Cleanup Vehicles

- HAZMAT Response Teams
  - HAZMAT Cleanup

Planned
HAZMAT Response Teams
HAZMAT Cleanup

incident status
emergency dispatch requests

HAZMAT Response Teams
HAZMAT Cleanup Vehicles

Planned
HAZMAT Response Teams
HAZMAT Cleanup Vehicles

County Emergency Communications ...
Blair County 911 Center

emergency dispatch requests
incident status

Planned
HAZMAT Response Teams
HAZMAT Cleanup Vehicles

Local Police Departments
Local Police Dispatch

emergency dispatch requests
incident status

Planned
HAZMAT Mitigation Containment Interconnect Diagram

- County Emergency Communications...
  - Blair County 911 Center

- Local Police Departments
  - Local Police Dispatch

- County Emergency Communications...
  - Local 911 Centers

- HAZMAT Response Teams
  - HAZMAT Cleanup

- Local HAZMAT Mitigation
  - HAZMAT Mitigation/Containment

- Local County Emergency Management Agencies

- Pennsylvania State Police (PSP)
  - Pennsylvania State Police Highway Dispatch Center

- Weather Information Service Providers
  - Weather Information Service

- Planned

- PennDOT Engineering District 9-0
  - PennDOT 9-0 TMC

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC
Local HAZMAT Mitigation

HAZMAT Mitigation/Containment

- incident report
- incident response coordination
- resource coordination

County Emergency Communications ...
Blair County 911 Center

_________________________ Planned
HAZMAT Response Teams
HAZMAT Cleanup

incident report
incident response coordination
resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
County Emergency Communications ...
Local 911 Centers

- incident report
- incident response coordination
- resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local County Emergency Management Agencies

- incident report
- incident response coordination
- resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

- incident report
- incident response coordination
- resource coordination

Local Police Departments
Local Police Dispatch

_________________________ Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

resource deployment status
road network conditions
incident information

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- incident report
- incident response coordination
- resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
Weather Information Service Providers

Weather Information Service

weather information

Local HAZMAT Mitigation

HAZMAT Mitigation/Containment

Planned
I-99 Bridge De-Icers Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

_________________________ Planned

PennDOT Engineering District 2-0
I-99 Bridge De-Icers
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0

PennDOT 2-0 TMC

- AHS status
- environmental conditions data
- freeway control status
- hov data
- hri status
- intersection blockage notification
- request for right-of-way
- reversible lane status
- roadway information system status
- signal control status
- traffic flow
- traffic images
- traffic probe data
- vehicle emissions data
- AHS control information
- environmental sensors control
- freeway control data
- hri control data
- hri request
- roadway information system data
- signal control data
- traffic sensor control
- video surveillance control

PennDOT Engineering District 2-0

I-99 Bridge De-Icers

Planned
I-99 CCTV Cameras Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Planned

PennDOT Engineering District 2-0
I-99 CCTV Cameras
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

- AHS status
- environmental conditions data
- freeway control status
- hov data
- hri status
- intersection blockage notification
- request for right-of-way
- reversible lane status
- roadway information system status
- signal control status
- traffic flow
- traffic images
- traffic probe data
- vehicle emissions data
- AHS control information
- environmental sensors control
- freeway control data
- hri control data
- hri request
- roadway information system data
- signal control data
- traffic sensor control
- video surveillance control

Planned
I-99 Detector Loops Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Central - Bureau of Planning...
I-99 Detector Loops

Planned
I-99 Dynamic Message Signs Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

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PennDOT Engineering District 2-0
I-99 Dynamic Message Signs

---

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

I-99 Dynamic Message Signs

Planned

AHS status
environmental conditions data
freeway control status
hov data
hri status
intersection blockage notification
request for right-of-way
reversible lane status
roadway information system status
signal control status
traffic flow
traffic images
traffic probe data
vehicle emissions data
AHS control information
environmental sensors control
freeway control data
hri control data
hri request
roadway information system data
signal control data
traffic sensor control
video surveillance control

Planned
I-99 HAR Stations Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

--- Planned

PennDOT Engineering District 2-0
I-99 HAR Stations
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- AHS status
- environmental conditions data
- freeway control status
- hov data
- hri status
- intersection blockage notification
- request for right-of-way
- reversible lane status
- roadway information system status
- signal control status
- traffic flow
- traffic images
- traffic probe data
- vehicle emissions data
- AHS control information
- environmental sensors control
- freeway control data
- hri control data
- hri request
- roadway information system data
- signal control data
- traffic sensor control
- video surveillance control

Planned

PennDOT Engineering District 2-0
I-99 HAR Stations
I-99 RWIS Stations Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Planned
I-99 Weigh-In-Motion (WIM) Station Interconnect Diagram

Commercial Vehicle Fleet Operators

Commercial Vehicle

PennDOT Engineering District 2-0

PennDOT 2-0 TMC

PennDOT Engineering District 2-0

I-99 Weigh-In-Motion (WIM) Station

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Commercial Vehicle Fleet Operators

Commercial Vehicle

- border clearance event
- electronic lock data request
- electronic screening request
- on-board safety request
- pass/pull-in
- safety inspection record
- electronic lock data
- on-board safety data
- screening event record

PennDOT Engineering District 2-0
I-99 Weigh-In-Motion (WIM) Station

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

I-99 Weigh-In-Motion (WIM) Station

Planned
Inter-City Bus Services Interconnect Diagram

Other Parking System Operators
Other Parking Management Systems in the Study Area

Concierge Service Provider
Concierge Service Center

Private Sector Inter-City Bus Companies
Inter-City Bus Services

Local Media
Newspaper, Radio, Television Stations

Planned
Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- multimodal information
- transit and fare schedules
- transit incident information
- transit request confirmation
- transit information request

Private Sector Inter-City Bus Company...
Inter-City Bus Services

Planned
Private Sector Inter-City Bus Company...
Inter-City Bus Services

Other Parking System Operators
Other Parking Management Systems in the Study Area

parking information

Planned
Private Sector Inter-City Bus Companies...
Inter-City Bus Services

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

Planned
County Emergency Communications ... 
Local 911 Centers

- incident status
- emergency dispatch requests

HAZMAT Response Teams
HAZMAT Cleanup Vehicles

Planned
### Archived Data Users

**Archived Data User System**

- emergency archive data
- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- archive requests
- archive status
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

### County Emergency Communications

**Local 911 Centers**

Planned
Area Transportation Authority of Nort...  
ATA Transit Operations Center

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Local 911 Centers

______________  Planned
Centre Area Transportation Authority...
CATA Bus Operations Center

- Incident information
- Incident response status
- Transit emergency data

County Emergency Communications...
Local 911 Centers

Planned
County Emergency Communications ...
   Local 911 Centers

   - transit emergency data
   - incident information
   - incident response status

Centre County Office of Transportation...
   Centre County Paratransit Services Center

______________________ Planned
County Emergency Communications ...
Local 911 Centers

- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- incident information

Clinton County 911 - RR Operations Coordination

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Commercial Vehicle Fleet Operators
- Commercial Vehicle Fleet Info. Systems

\[\text{incident information}\]

County Emergency Communications ...
- Local 911 Centers

\[\text{Planned}\]
Concierge Service Provider
Concierge Service Center

↑ incident information

County Emergency Communications ...
Local 911 Centers

------------------------ Planned
DuBois, Falls Creek, Sandy Township...  
DuFAST Transit Office

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Local 911 Centers

----------------------  Planned
Weather Information Service Providers
Weather Information Service

weather information

County Emergency Communications ...
Local 911 Centers

Planned
Local EMS Responders
Local EMS Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Local 911 Centers

Planned
Local Fire Companies
Local Fire Vehicles

Emergency dispatch requests
Incident status

County Emergency Communications ...
Local 911 Centers

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Police Departments
Local Police Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Local 911 Centers

Planned
Local School Districts
Local School District Transportation Dispatch

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Local 911 Centers

_________________________ Planned
North Central Pennsylvania Regional ... Mapping, Addressing, and Internet Mapping

map update request
map updates

County Emergency Communications ...
Local 911 Centers

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications ...
Local 911 Centers

- transit emergency data
- incident information
- incident response status

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging
Transit Center

Planned
County Emergency Communications ... Local 911 Centers

incident notification
incident notification response

North Central Pennsylvania Regional ... Mobile Voice/Data Radio Network

Planned
Local Media
Newspaper, Radio, Television Stations

incident information for media

County Emergency Communications ...
Local 911 Centers

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications...
Local 911 Centers

- incident report
- incident response coordination
- resource coordination

PA Emergency Management Agency...
PA Emergency Management Agency (PEMA)

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- remote surveillance control
- resource deployment status
- road network conditions
- traffic images
- incident information

County Emergency Communications ...
Local 911 Centers

Planned
County Emergency Communications ...
Local 911 Centers

- alarm notification
- secure area sensor data
- secure area surveillance data
- alarm acknowledge
- secure area sensor control
- secure area surveillance control

PennDOT Engineering District 2-0
PennDOT 2-0 Traffic Section Kiosks

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

| emergency dispatch requests |
| incident status |

County Emergency Communications ...
Local 911 Centers

__________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Rail Operators
Rail Operation Centers

↓ Disaster Information

County Emergency Communications ...
Local 911 Centers

Existing
Regional EMS Councils
Regional Emergency Medical Services Coordination

- emergency archive data
- archive requests
- archive status
- incident report
- incident response coordination
- resource coordination

County Emergency Communications ...
Local 911 Centers

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications ...
Local 911 Centers

incident notification
incident notification response

North Central Pennsylvania Regional ...
Regional Wireless Data Network

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Bureau of State Parks
State and National Parks

event confirmation
event plans

County Emergency Communications ...
Local 911 Centers

Planned
Convention and Visitors Bureaus
Tourists Information Services

County Emergency Communications ...
Local 911 Centers

- event confirmation
- event plans

------------ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Towing Companies
Tow Dispatch

- incident report
- incident response coordination
- resource coordination

County Emergency Communications ...
Local 911 Centers

Planned
Travelers
User Personal Computing Devices

emergency acknowledge
emergency notification

County Emergency Communications ...
Local 911 Centers

Planned
County Emergency Communications ...
Local 911 Centers

- incident report
- incident response coordination
- resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
Local Airports Interconnect Diagram

- **AMTRAN**
  - AMTRAN Bus Operation Center

- **DuBois, Falls Creek, Sandy Township**
  - DuFAST Transit Office

- **Area Transportation Authority of Northumberland County**
  - ATA Transit Operations Center

- **Local Airport Management (Private airports)**
  - Local Airports

- **Concierge Service Provider**
  - Concierge Service Center

- **Centre Area Transportation Authority**
  - CATA Bus Operations Center

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Local Airport Management (Private a...
Local Airports

multimodal service data
transit multimodal information

Planned
Local Airport Management (Private a... Local Airports

transit multimodal information
multimodal service data

AMTRAN
AMTRAN Bus Operation Center

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

multimodal service data
transit multimodal information

Local Airport Management (Private a...
Local Airports

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

multimodal service data
transit multimodal information

Local Airport Management (Private a...
Local Airports

Planned
Local Chambers of Commerce & Economic Development Organizations Interconnect Diagram

Local County Planning Commissions
County Planning Commission

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Economic Development Organizations
Local Chambers of Commerce & Economic Development Organizations

Planned
Economic Development Organizations
Local Chambers of Commerce &
Economic Development Organizations

Regional MPO/LDD
Regional Transportation Planning and
Development Programs

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Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

**Economic Development Organizations**

Local Chambers of Commerce & Economic Development Organizations

- archive requests
- archive status
- other data source archive data

**Local County Planning Commissions**

County Planning Commission

------------------------ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of Nort...
ATA Transit Operations Center

Local County Emergency Management...
Local County Emergency Management Agencies

incident information
incident response status
transit emergency data

Planned
Local County Emergency Management...
Local County Emergency Management Agencies

- incident report
- incident response coordination
- resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
Centre Area Transportation Authority...
CATA Bus Operations Center

- incident information
- incident response status
- transit emergency data

Local County Emergency Management...
Local County Emergency Management Agencies

Planned
Local County Emergency Management Agencies

- transit emergency data
- incident information
- incident response status

Centre County Office of Transportation... Centre County Paratransit Services Center

____________________ Planned
Concierge Service Provider
Concierge Service Center

Local County Emergency Management...
Local County Emergency Management Agencies

↑ incident information

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

incident information
incident response status
transit emergency data

Local County Emergency Management...
Local County Emergency Management Agencies

Planned
Local County Emergency Management
Local County Emergency Management Agencies

- incident report
- incident response coordination
- resource coordination

HAZMAT Response Teams
HAZMAT Cleanup

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Weather Information Service Providers
- Weather Information Service

-weather information

Local County Emergency Management Agencies

- Local County Emergency Management Agencies

- Planned
Local County Emergency Management Agencies

- incident status
- emergency dispatch requests

Local EMS Responders

Local EMS Vehicles

Planned
Local School Districts
Local School District Transportation
Dispatch

Local County Emergency Management...
Local County Emergency Management Agencies

incident information
incident response status
transit emergency data

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local County Emergency Management Agencies

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

- transit emergency data
- incident information
- incident response status

Planned
Local County Emergency Management Agencies

incident notification
incident notification response

North Central Pennsylvania Regional...
Mobile Voice/Data Radio Network

Planned
Local Media
Newspaper, Radio, Television Stations

Local County Emergency Management...
Local County Emergency Management Agencies

incident information for media

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local County Emergency Management Agencies
- incident report
- incident response coordination
- resource coordination

PA Emergency Management Agency (PEMA)

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- remote surveillance control
- resource deployment status
- road network conditions
- traffic images
- incident information

Local County Emergency Management...
Local County Emergency Management Agencies

Planned

Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local County Emergency Management...
Local County Emergency Management Agencies

- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- incident report
- incident response coordination
- resource coordination

Local County Emergency Management...
Local County Emergency Management Agencies

Planned
Local County Emergency Management Agencies

Regional EMS Councils
Regional Emergency Medical Services Coordination

- archive requests
- archive status
- emergency archive data
- incident report
- incident response coordination
- resource coordination

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local County Planning Commissions
County Planning Commission

- emergency archive data
- archive requests
- archive status

Local County Emergency Management...
Local County Emergency Management Agencies

Planned
Local EMS Vehicles Interconnect Diagram
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications...
Blair County 911 Center

Local Municipalities in Study Area
Local Traffic Signal Equipment

Local EMS Responders
Local EMS Vehicles

Local County Emergency Management Agencies

Aero Medical Transport Service Provider
Aero Medical Transport Services

Planned
Local County Emergency Management Agencies

Local EMS Responders

Local EMS Vehicles

incident status

emergency dispatch requests

Planned
Local EMS Responders
Local EMS Vehicles

- Emergency dispatch requests
- Incident status

County Emergency Communications...
Local 911 Centers

----------------------- Planned
Local EMS Responders
Local EMS Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Blair County 911 Center

Planned
Aero Medical Transport Service Provider
Aero Medical Transport Services

incident status
emergency dispatch requests

Local EMS Responders
Local EMS Vehicles

Planned
Local EMS Responders
  Local EMS Vehicles

Local Municipalities in Study Area
  Local Traffic Signal Equipment

local signal preemption request

Planned
Local Fire Dispatch Interconnect Diagram

Local Fire Companies
- Local Fire Vehicles

PennDOT Engineering District 2-0
- PennDOT 2-0 TMC

Local Fire Companies
- Local Fire Dispatch

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Local Fire Companies
Local Fire Dispatch

resource deployment status
road network conditions
incident information

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Fire Companies
Local Fire Vehicles

- emergency dispatch requests
- incident status

Local Fire Companies
Local Fire Dispatch

Planned
Local Fire Vehicles Interconnect Diagram

- Local Fire Companies
  - Local Fire Dispatch

- Local Municipalities in Study Area
  - Local Traffic Signal Equipment

- Local Fire Companies
  - Local Fire Vehicles

- County Emergency Communications
  - Blair County 911 Center

- Local 911 Centers

Planned
Local Fire Companies
Local Fire Vehicles

- emergency dispatch requests
- incident status

Local Fire Companies
Local Fire Dispatch

------------------ Planned
Local Fire Companies
Local Fire Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Blair County 911 Center

Planned
Local Fire Companies
Local Fire Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Local 911 Centers

Planned
Local Fire Companies
  Local Fire Vehicles

Local Municipalities in Study Area
  Local Traffic Signal Equipment

Local signal preemption request

Planned
Local Fleet and Freight Management Systems Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 Oversize/Overweight Permitting

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Local Fleet and Freight Management Systems

Planned

Commercial Vehicle Fleet Operators
Commercial Vehicle Fleet Info. Systems

Commercial Vehicle Fleet Operators
Commercial Vehicle
Commercial Vehicle Fleet Operators

- Commercial Vehicle
- fleet to driver update
- driver to fleet request
- on-board vehicle data

Local Fleet and Freight Management ...

- Local Fleet and Freight Management Systems

Planned
Commercial Vehicle Fleet Operators
  Commercial Vehicle Fleet Info.
  Systems

---

route request
route plan

Local Fleet and Freight Management ...
  Local Fleet and Freight Management Systems

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- hazmat information
- hazmat information request

Local Fleet and Freight Management ...
Local Fleet and Freight Management Systems

- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 Oversize/Overweight Permitting

credential application
- tax filing
- compliance review report
- credentials information
- safety inspection report

Local Fleet and Freight Management ...
Local Fleet and Freight Management Systems

Planned
Local Police Crash Reporting System Interconnect Diagram

PennDOT Central-Bureau of Highwa...
PennDOT Central Crash Information System and Analysis

Local Police Departments
Local Police Crash Reporting System

Planned
PennDOT Central-Bureau of Highways
PennDOT Central Crash Information System and Analysis

- emergency archive data
- archive requests
- archive status

Local Police Departments
Local Police Crash Reporting System

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Police Dispatch Interconnect Diagram

North Central Pennsylvania Regional ... Mobile Voice/Data Radio Network

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Towing Companies
Tow Dispatch Vehicles

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Local Police Departments
Local Police Dispatch

HAZMAT Response Teams
HAZMAT Cleanup Vehicles

Local Police Departments
Local Police Vehicles

Planned

PennDOT Engineering District 2-0
PennDOT 2-0 TMC
HAZMAT Response Teams
HAZMAT Cleanup Vehicles

Local Police Departments
Local Police Dispatch

emergency dispatch requests
incident status

----------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

- incident report
- incident response coordination
- resource coordination

Local Police Departments
Local Police Dispatch

------------------------ Planned

400
Local Police Departments
Local Police Dispatch

Towing Companies
Tow Dispatch Vehicles

- emergency dispatch requests
- incident status

Planned
Local Police Departments
Local Police Vehicles

- Emergency dispatch requests
- Incident status

Local Police Departments
Local Police Dispatch

----------------------- Planned
Mobile Voice/Data Radio Network

Local Police Departments
Local Police Dispatch

incident notification
incident notification response

North Central Pennsylvania Regional ...
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local Police Departments
Local Police Dispatch

- Emergency traffic control request
- Incident response status
- Remote surveillance control
- Resource request
- Emergency traffic control information
- Request for enforcement
- Resource deployment status
- Road network conditions
- Traffic images
- Traffic violation notification
- Incident information

Planned
Local Police Vehicles Interconnect Diagram

County Emergency Communications ...
Blair County 911 Center

Local Municipalities in Study Area
Local Traffic Signal Equipment

Local Police Departments
Local Police Dispatch

Local Police Departments
Local Police Vehicles

County Emergency Communications ...
Local 911 Centers

Planned
Local Police Departments
Local Police Vehicles

\[\begin{align*}
\text{emergency dispatch requests} \quad & \text{County Emergency Communications ...} \\
\text{incident status} \quad & \text{Local 911 Centers}
\end{align*}\]

Planning

Figure 16. Emergency Communications

PennDOT District 2-0 ITS Architecture Region
Local Police Departments
Local Police Vehicles

- emergency dispatch requests
- incident status

County Emergency Communications ...
Blair County 911 Center

Planned
Local Police Departments
Local Police Vehicles

- emergency dispatch requests
- incident status

Local Police Departments
Local Police Dispatch

Planned
Local Police Departments
Local Police Vehicles

Local Municipalities in Study Area
Local Traffic Signal Equipment

local signal preemption request

Planned
Local School Districts
Local School District School Buses

- transit vehicle location data
- transit vehicle schedule performance

Local School Districts
Local School District Transportation Dispatch

------------------------ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local School Districts
Local School District School Buses

- transit vehicle location data
- transit vehicle schedule performance

Local School Districts
Local School District Transportation Dispatch

Planned
Area Transportation Authority of Nort...  
ATA Transit Operations Center

Local School Districts
Local School District Transportation Dispatch

transit service coordination
transit traveler information coordination

Planned
Local School Districts
Local School District Transportation Dispatch

incident information
incident response status
transit emergency data

County Emergency Communications ...
Blair County 911 Center

Planned
Centre Area Transportation Authority ... 
CATA Bus Operations Center

transit service coordination
transit traveler information coordination

----------------- Planned

Local School Districts
Local School District Transportation Dispatch
Local School Districts
Local School District Transportation Dispatch

- incident information
- incident response status
- transit emergency data

County Emergency Communications ...
Local 911 Centers

__________________________ Planned
Local School Districts
Local School District Transportation Dispatch

Local County Emergency Management Agency

- Incident information
- Incident response status
- Transit emergency data

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- traffic control priority request
- transit demand management response
- transit system data
- request transit information
- road network conditions
- traffic control priority status
- transit demand management request

Local School Districts
Local School District Transportation Dispatch

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Road network conditions

Local School Districts
Local School District Transportation Dispatch

Planned
Local Traffic Signal Control Systems Interconnect Diagram

County Emergency Communications ...
- Clinton County 911 - RR Operations Coordination

Local Municipalities in Study Area
- Local Traffic Signal Equipment

PennDOT Engineering District 2-0
- PennDOT 2-0 TMC

Local Municipalities in Study Area
- Local Traffic Signal Control Systems

PennDOT Engineering District 9-0
- PennDOT 9-0 TMC

Planned
Local Municipalities in Study Area
Local Traffic Signal Control Systems

Traffic control coordination
Traffic information coordination

County Emergency Communications...
Clinton County 911 - RR Operations Coordination

_________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- traffic control coordination
- traffic information coordination

Local Municipalities in Study Area
Local Traffic Signal Control Systems

Planned
Local Municipalities in Study Area
Local Traffic Signal Control Systems

- hri status
- request for right-of-way
- signal control status
- traffic flow
- traffic images
- hri control data
- hri request
- signal control data
- speed monitoring control
- traffic sensor control
- video surveillance control

Local Municipalities in Study Area
Local Traffic Signal Equipment

Planned
Local Traffic Signal Equipment Interconnect Diagram
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Municipalities in Study Area
- Local Traffic Signal Control Systems

Local EMS Responders
- Local EMS Vehicles

Local Fire Companies
- Local Fire Vehicles

Local Municipalities in Study Area
- Local Traffic Signal Equipment

Local Police Departments
- Local Police Vehicles

Pennsylvania State Police (PSP)
- Pennsylvania State Police Patrol Vehicles

PennDOT Engineering District 2-0
- PennDOT 2-0 TMC

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Municipalities in Study Area
Local Traffic Signal Control Systems

- hri status
- request for right-of-way
- signal control status
- traffic flow
- traffic images
- hri control data
- hri request
- signal control data
- speed monitoring control
- traffic sensor control
- video surveillance control

Local Municipalities in Study Area
Local Traffic Signal Equipment

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local EMS Responders
Local EMS Vehicles

Local Municipalities in Study Area
Local Traffic Signal Equipment

local signal preemption request

Planned
Local Fire Companies
Local Fire Vehicles

Local Municipalities in Study Area
Local Traffic Signal Equipment

local signal preemption request

Planned
Local Police Departments
Local Police Vehicles

Local Municipalities in Study Area
Local Traffic Signal Equipment

local signal preemption request

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- signal control status
- signal control data

Local Municipalities in Study Area
Local Traffic Signal Equipment

------------------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Pennsylvania State Police (PSP)

Pennsylvania State Police Patrol Vehicles

Local signal preemption request

Local Municipalities in Study Area

Local Traffic Signal Equipment

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Mapping, Addressing, and Internet Mapping Interconnect Diagram

- County Emergency Communications...
  - Blair County 911 Center
- PennDOT Central-Bureau of Highways...
  - Advanced Traveler Information and Resource Center (ATIRC)
- Area Transportation Authority of North... 
  - ATA Transit Operations Center
- North Central Pennsylvania Regional...
  - Mapping, Addressing, and Internet Mapping
- DuBois, Falls Creek, Sandy Township...
  - DuFAST Transit Office
- Regional MPO/LDD
  - Regional Transportation Planning and Development Programs
- PennDOT Engineering District 2-0...
  - PennDOT 2-0 TMC
- PennDOT Engineering District 9-0...
  - PennDOT 9-0 TMC

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

North Central Pennsylvania Regional...
Mapping, Addressing, and Internet Mapping

map update request
map updates

County Emergency Communications...
Local 911 Centers

Planned
North Central Pennsylvania Regional Region
Mapping, Addressing, and Internet Mapping

PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

map update request
map updates

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of North Pennsylvania
ATA Transit Operations Center

Map updates
Map update request

North Central Pennsylvania Regional ...
Mapping, Addressing, and Internet Mapping

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

↑ map updates
↑ map update request

North Central Pennsylvania Regional ...
Mapping, Addressing, and Internet Mapping

------------------------ Planned
North Central Pennsylvania Regional... Mapping, Addressing, and Internet Mapping

Regional MPO/LDD
Regional Transportation Planning and Development Programs

map update request
map updates

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

North Central Pennsylvania Regional...
Mapping, Addressing, and Internet Mapping

map updates
map update request

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

North Central Pennsylvania Regional ...
Mapping, Addressing, and Internet Mapping

map updates
map update request

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Mifflin-Juniata Area Agency on Aging Transit Center Interconnect Diagram

Mifflin-Juniata Area Agency on Aging... Mifflin-Juniata Area Agency on Aging Transit Vehicles

Centre County Office of Transportation... Centre County Paratransit Services Center

County Emergency Communications... Local 911 Centers

Local County Emergency Management... Local County Emergency Management Agencies

Mifflin-Juniata Area Agency on Aging... Mifflin-Juniata Area Agency on Aging Transit Center

Amtrak Amtrak Passenger Train Terminal (Lewistown)

Weather Information Service Providers Weather Information Service

Local Media Newspaper, Radio, Television Stations

Travelers User Personal Computing Devices

Centre Area Transportation Authority... CATA Bus Operations Center

Financial Institutions Financial Institutions

PennDOT Engineering District 2-0 PennDOT 2-0 TMC

Concierge Service Provider Concierge Service Center

Planned
Financial Institutions

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging
Transit Center

payment request
transaction status

Planned
County Emergency Communications...
Local 911 Centers

- transit emergency data
- incident information
- incident response status

Mifflin-Juniata Area Agency on Aging,
Mifflin-Juniata Area Agency on Aging
Transit Center

Planned
Local County Emergency Management Agencies

Regional ITS Architecture

PennDOT District 2-0 ITS Architecture Region

Mifflin-Juniata Area Agency on Aging

Transit Center

Transit emergency data

Incident information

Incident response status

Local County Emergency Management Agencies

Planned
Amtrak
Amtrak Passenger Train Terminal
(Lewistown)

Mifflin-Juniata Area Agency on Aging,
Mifflin-Juniata Area Agency on Aging
Transit Center

Planned

---

transit multimodal information
multimodal service data
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre County Office of Transportation...
Centre County Paratransit Services Center

transit service coordination
transit traveler information coordination

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation
- demand responsive transit request
- selected routes
- transit information request

Mifflin-Juniata Area Agency on Aging,
Mifflin-Juniata Area Agency on Aging
Transit Center

---------------------------------- Planned

452
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Weather Information Service Providers
Weather Information Service

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

weather information

Planned
Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

- transit vehicle location data
- transit vehicle schedule performance

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Vehicles

Planned
Local Media
Newspaper, Radio, Television Stations

- transit incidents for media
- transit information for media

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging
Transit Center

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging
Transit Center

Planned
Travelers
User Personal Computing Devices

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging
Transit Center

__________________________ Planned

personal transit information
transit information user request
Mifflin-Juniata Area Agency on Aging Transit Vehicles Interconnect Diagram

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging
Transit Center

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging
Transit Vehicles

Planned
Mifflin-Juniata Area Agency on Aging,
Mifflin-Juniata Area Agency on Aging
Transit Center

\[\text{transit vehicle location data} \rightarrow \text{transit vehicle schedule performance}\]

Mifflin-Juniata Area Agency on Aging,
Mifflin-Juniata Area Agency on Aging
Transit Vehicles

\[\text{Planned}\]
Mobile Voice Data Radio Network Interconnect Diagram

Local Police Departments
  Local Police Dispatch

County Emergency Communications
  Local 911 Centers

Local County Emergency Management Agencies

North Central Pennsylvania Regional
  Mobile Voice/Data Radio Network

Pennsylvania State Police (PSP)
  Pennsylvania State Police Highway Dispatch Center

Planned
Local County Emergency Management... 
Local County Emergency Management Agencies

incident notification
incident notification response

North Central Pennsylvania Regional ... 
Mobile Voice/Data Radio Network

Planned
Local Police Departments
Local Police Dispatch

incident notification
incident notification response

North Central Pennsylvania Regional ...
Mobile Voice/Data Radio Network

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications ...
Local 911 Centers

incident notification
incident notification response

North Central Pennsylvania Regional ...
Mobile Voice/Data Radio Network

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway
Dispatch Center

incident notification
incident notification response

North Central Pennsylvania Regional ...
Mobile Voice/Data Radio Network

Planned
Municipal Construction and Maintenance Interconnect Diagram

Local County Planning Commissions
  County Planning Commission

PennDOT Engineering District 2-0
  PennDOT 2-0 TMC

PennDOT Engineering District 2-0
  PennDOT 2-0 Maintenance Districts (2-1 to 2-9)

Local Municipalities in Study Area
  Municipal Construction and Maintenance

Existing
Planned
Local County Planning Commissions
County Planning Commission

- maint and constr archive data
- archive requests
- archive status

Local Municipalities in Study Area
Municipal Construction and Maintenance

----------------------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- current asset restrictions
- maint and constr resource response
- maint and constr resource request
- road network conditions

Local Municipalities in Study Area
Municipal Construction and Maintenance

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts (2-1 to 2-9)

- Road and Lane Closure Plans
- Roadway maintenance status
- Work plan coordination
- Work zone information

Local Municipalities in Study Area
Municipal Construction and Maintenance

Existing
Planned
Newspaper, Radio, Television Stations Interconnect Diagram

PennDOT Engineering District 9-0
- PennDOT 9-0 TMC

Mifflin-Juniata Area Agency on Aging
- Mifflin-Juniata Area Agency on Aging Transit Center

Concierge Service Provider
- Concierge Service Center

Area Transportation Authority of Nort...
- ATA Transit Operations Center

PennDOT Engineering District 2-0
- PennDOT 2-0 TMC

Local Media
- Newspaper, Radio, Television Stations

DuBois, Falls Creek, Sandy Townshi...
- DuFAST Transit Office

Centre Area Transportation Authority
- CATA Bus Operations Center

Private Sector Inter-City Bus Compan...
- Inter-City Bus Services

AMTRAN
- AMTRAN Bus Operation Center

County Emergency Communications ...
- Local 911 Centers

Pennsylvania State Police (PSP)
- Pennsylvania State Police Highway Dispatch Center

County Emergency Communications ...
- Blair County 911 Center

PennDOT Central-Bureau of Highwa...
- Advanced Traveler Information and Resource Center (ATIRC)

Centre County Office of Transportatio...
- Centre County Paratransit Services Center

Local County Emergency Manage...
- Local County Emergency Management Agencies

Planned
Local Media
Newspaper, Radio, Television Stations

Mifflin-Juniata Area Agency on Aging, ...
Mifflin-Juniata Area Agency on Aging Transit Center

--- Planned

transit incidents for media
transit information for media
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

- external reports
- traveler information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Local Media
Newspaper, Radio, Television Stations

AMTRAN
AMTRAN Bus Operation Center

↑ transit information for media

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Media
Newspaper, Radio, Television Stations

incident information for media

County Emergency Communications ...
Blair County 911 Center

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

------------------ Planned
Local Media
Newspaper, Radio, Television Stations

Transit incidents for media
Transit information for media

Centre County Office of Transportation...
Centre County Paratransit Services Center

Planned
Concierge Service Provider
Concierge Service Center

Local Media
Newspaper, Radio, Television Stations

---
Planned

- external reports
- traveler information for media
DuBois, Falls Creek, Sandy Townshi...
DuFAST Transit Office

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Private Sector Inter-City Bus Company... Inter-City Bus Services

- transit incidents for media
- transit information for media

Local Media
Newspaper, Radio, Television Stations

Planned
Local Media
Newspaper, Radio, Television Stations

Incident information for media

County Emergency Communications...
Local 911 Centers

Planned
Local Media
Newspaper, Radio, Television Stations

incident information for media

Local County Emergency Management...
Local County Emergency Management Agencies

Planned
Local Media
Newspaper, Radio, Television Stations

incident information for media

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Planned
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

Road network conditions

Local Media

Newspaper, Radio, Television Stations

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local Media
Newspaper, Radio, Television Stations

External reports
Road network conditions

Planned
NYSDOT-Regions 5 & 6 TMCs Interconnect Diagram

PennDOT Engineering District 2-0
PenndOT 2-0 TMC

New York State DOT-Regions 5 & 6
NYSDOT- Regions 5 & 6 TMCs

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

New York State DOT-Regions 5 & 6
NYSDOT- Regions 5 & 6 TMCs

traffic control coordination
traffic information coordination

Planned
Other Parking Management Systems in the Study Area

- AMTRAN
  - AMTRAN Bus Operation Center

- Regional MPO/LDD
  - Regional Transportation Planning and Development Programs

- Other Parking System Operators
  - Other Parking Management Systems in the Study Area

- Penn State University-Department of...
  - PSUITS Parking Office and Event Coordinator

- Regional ITS Architecture Region
  - University Park Airport Management
    - University Park Airport Parking
  - Local County Planning Commissions
    - County Planning Commission

- Private Sector Inter-City Bus Company...
  - Inter-City Bus Services

- Financial Institutions
  - Financial Institutions

- Centre Area Transportation Authority...
  - CATA Bus Operations Center

- Area Transportation Authority of Nor...
  - ATA Transit Operations Center

- DuBois, Falls Creek, Sandy Township...
  - DuFAST Transit Office

- Concierge Service Provider
  - Concierge Service Center

- Planned
Private Sector Inter-City Bus Company...

Inter-City Bus Services

Parking information

Other Parking System Operators

Other Parking Management Systems in the Study Area

Planned
Other Parking System Operators

Other Parking Management Systems in the Study Area

parking information

AMTRAN

AMTRAN Bus Operation Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of Northeastern Pennsylvania
ATA Transit Operations Center

Other Parking System Operators
Other Parking Management Systems in the Study Area

planned

parking information
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
  CATA Bus Operations Center

↑ parking information

Other Parking System Operators
Other Parking Management Systems in the Study Area

________________________  Planned
Concierge Service Provider
Concierge Service Center

Other Parking System Operators
Other Parking Management Systems in the Study Area

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

Planned
Local County Planning Commissions
County Planning Commission

- parking archive data
- archive requests
- archive status

Other Parking System Operators
Other Parking Management Systems in the Study Area

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Other Parking System Operators
Other Parking Management Systems in the Study Area

parking information

Planned
University Park Airport Management
University Park Airport Parking

Other Parking System Operators
Other Parking Management Systems in the Study Area

parking coordination

Planned
Penn State University-Department of...
PSUTS Parking Office and Event Coordinator

Parking coordination

Other Parking System Operators
Other Parking Management Systems in the Study Area

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Regional MPO/LDD
Regional Transportation Planning and Development Programs

- parking archive data
- archive requests
- archive status

Other Parking System Operators
Other Parking Management Systems in the Study Area

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Financial Institutions

Other Parking System Operators
Other Parking Management Systems in the Study Area

--- Planned

Payment request
Transaction status
PA Emergency Management Agency (PEMA) Interconnect Diagram

- County Emergency Communications...
  - Blair County 911 Center

- Local County Emergency Management Agencies
  - Local County Emergency Management Agencies

- Pennsylvania State Police (PSP)
  - Pennsylvania State Police Highway Dispatch Center

- PennDOT Central-Bureau of Highways
  - Advanced Traveler Information and Resource Center (ATIRC)

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

County Emergency Communications ...
Local 911 Centers

- incident report
- incident response coordination
- resource coordination

PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

__________________________ Planned
Local County Emergency Management Agencies

PA Emergency Management Agency (PEMA)

- incident report
- incident response coordination
- resource coordination

Planned
PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

- Emergency archive data
- Emergency traffic control request
- Incident response status
- Remote surveillance control
- Resource request
- Archive requests
- Archive status
- Emergency traffic control information
- Resource deployment status
- Incident information

PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

Planned
PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA) ...

incident report
incident response coordination
resource coordination

County Emergency Communications ...  
Blair County 911 Center

________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- resource deployment status
- road network conditions
- incident information

PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

Planned
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs Interconnect Diagram
Archived Data Users
Archived Data User System

traffic control coordination
traffic information coordination

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

- traffic control coordination
- traffic information coordination

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

------------------ Planned
PennDOT Engineering Districts 1-0, ...

PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

------------------- Planned

traffic control coordination
traffic information coordination

PennDOT Engineering District 9-0
PennDOT 9-0 TMC
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

traffic control coordination
traffic information coordination

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

------------------------ Planned
PennDOT 2-0 Construction Interconnect Diagram

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- PennDOT Engineering District 2-0
  - PennDOT 2-0 Construction

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Closure Coordination (reverse)
equipment maintenance status
maint and constr resource response
work zone information
field equipment status
maint and constr resource request
work plan feedback

-- Planned --

PennDOT Engineering District 2-0
PennDOT 2-0 Construction
PennDOT 2-0 Field Equipment Interconnect Diagram

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2
(Blair County)

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Engineering District 2-0
PennDOT 2-0 Field Equipment

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- environmental conditions data
- freeway control status
- roadway information system status
- traffic flow
- traffic images
- environmental sensors control
- freeway control data
- roadway information system data
- speed monitoring control
- traffic sensor control
- video surveillance control

PennDOT Engineering District 2-0
PennDOT 2-0 Field Equipment

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- environmental conditions data
- freeway control status
- roadway information system status
- traffic flow
- traffic images
- AHS control information
- environmental sensors control
- freeway control data
- roadway information system data
- traffic sensor control
- video surveillance control

PennDOT Engineering District 2-0
PennDOT 2-0 Field Equipment

Planned
PennDOT 2-0 Maintenance Districts (2-1 to 2-9) Interconnect Diagram

Local Municipalities in Study Area
Municipal Construction and Maintenance

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Existing

Planned

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts (2-1 to 2-9)

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts (2-1 to 2-9) Vehicles
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

Closure Coordination (reverse)
equipment maintenance status
maint and constr resource response
work zone information
field equipment status
maint and constr resource request
work plan feedback

PennDOT Engineering District 2-0

PennDOT 2-0 Maintenance Districts (2-1 to 2-9) Vehicles

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Current asset restrictions
Maint and constr resource response
Road weather information
Maint and constr resource request
Road network conditions

Planned

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts
(2-1 to 2-9)
PennDOT 2-0 Maintenance Districts (2-1 to 2-9) Vehicles Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts (2-1 to 2-9)

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts (2-1 to 2-9) Vehicles

Existing
Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- current asset restrictions
- maintain and construct resource response
- road weather information
- maintain and construct resource request
- road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts (2-1 to 2-9)

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts
(2-1 to 2-9)

- environmental sensor data
- infrastructure conditions data
- maint and constr dispatch status
- maint and constr vehicle conditions
- maint and constr vehicle location data
- maint and constr vehicle operational data

Maintenance Vehicle Response
- work zone status
- work zone warning status
- environmental sensors control
- maint and constr dispatch information
- maint and constr vehicle system control

Maintenance Vehicle Request

PennDOT Engineering District 2-0
PennDOT 2-0 Maintenance Districts
(2-1 to 2-9) Vehicles

Existing
Planned
PennDOT 2-0 Oversize Overweight Permitting Interconnect Diagram

Local Fleet and Freight Management...
  Local Fleet and Freight Management Systems

PennDOT Engineering District 2-0
  PennDOT 2-0 TMC

PennDOT Engineering District 2-0
  PennDOT 2-0 Oversize/Overweight Permitting

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 Oversize/Overweight Permitting

- credential application
- tax filing
- compliance review report
- credentials information
- safety inspection report

Local Fleet and Freight Management ...
Local Fleet and Freight Management Systems

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

traffic control coordination
traffic information coordination

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

archive requests
archive status
road network conditions
traffic archive data

PennDOT Central-Bureau of Highway...
Advanced Traveler Information and Resource Center (ATIRC)

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

resource deployment status
incident information

Aero Medical Transport Service Provider
Aero Medical Transport Services

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Traffic control priority request
Transit demand management response
Transit probe data
Transit system data
Request transit information
Road network conditions
Traffic control priority status
Transit demand management request

AMTRAN
AMTRAN Bus Operation Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Archived Data Users

Archived Data User System

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

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Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

_________________________ Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Centre County Office of Transportation...
Centre County Paratransit Services Center

road network conditions

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

traffic control coordination
traffic information coordination

County Emergency Communications ...
Clinton County 911 - RR Operations Coordination

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Commercial Vehicle Fleet Operators
Commercial Vehicle Fleet Info.
Systems

Planned
Concierge Service Provider
  Concierge Service Center

road network conditions

PennDOT Engineering District 2-0
  PennDOT 2-0 TMC

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

resource deployment status
road network conditions
incident information

HAZMAT Response Teams
HAZMAT Cleanup

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- resource deployment status
- road network conditions
- incident information

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

_________________________ Planned
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

- AHS status
- environmental conditions data
- freeway control status
- hov data
- hri status
- intersection blockage notification
- request for right-of-way
- reversible lane status
- roadway information system status
- signal control status
- traffic flow
- traffic images
- traffic probe data
- vehicle emissions data
- AHS control information
- environmental sensors control
- freeway control data
- hri control data
- hri request
- roadway information system data
- signal control data
- traffic sensor control
- video surveillance control

PennDOT Engineering District 2-0

I-99 Dynamic Message Signs

Planned
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

- AHS status
- environmental conditions data
- freeway control status
- hov data
- hri status
- intersection blockage notification
- request for right-of-way
- reversible lane status
- roadway information system status
- signal control status
- traffic flow
- traffic images
- traffic probe data
- vehicle emissions data
- AHS control information
- environmental sensors control
- freeway control data
- hri control data
- hri request
- roadway information system data
- signal control data
- traffic sensor control
- video surveillance control

Planned

PennDOT Engineering District 2-0

I-99 HAR Stations
PennDOT Engineering District 2-0

PennDOT 2-0 TMC

- AHS status
- environmental conditions data
- freeway control status
- hov data
- hri status
- intersection blockage notification
- request for right-of-way
- reversible lane status
- roadway information system status
- signal control status
- traffic flow
- traffic images
- traffic probe data
- vehicle emissions data
- AHS control information
- environmental sensors control
- freeway control data
- hri control data
- hri request
- roadway information system data
- traffic control data
- traffic sensor control
- video surveillance control

Planned

PennDOT Engineering District 2-0

I-99 RWIS Stations
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

AHS status
environmental conditions data
freeway control status
hov data
hri status
intersection blockage notification
request for right-of-way
reversible lane status
roadway information system status
signal control status
traffic flow
traffic images
traffic probe data
vehicle emissions data
AHS control information
environmental sensors control
freeway control data
hri control data
hri request
roadway information system data
signal control data
traffic sensor control
video surveillance control

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- remote surveillance control
- resource deployment status
- road network conditions
- traffic images
- incident information

County Emergency Communications ...
Local 911 Centers

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- remote surveillance control
- resource deployment status
- road network conditions
- traffic images
- incident information

Local County Emergency Management...
Local County Emergency Management Agencies

____________________  Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- resource deployment status
- road network conditions
- incident information

Local Fire Companies
Local Fire Dispatch

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

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**PennDOT Engineering District 2-0**

**PennDOT 2-0 TMC**

- resource deployment status
- road network conditions
- incident information

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**Local Police Departments**

**Local Police Dispatch**

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Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

- road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Local School Districts
Local School District Transportation Dispatch

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

signal control status
signal control data

Local Municipalities in Study Area
Local Traffic Signal Equipment

------------------------ Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- current asset restrictions
- maint and constr resource response
- maint and constr resource request
- road network conditions

Local Municipalities in Study Area
Municipal Construction and Maintenance

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Local Media
Newspaper, Radio, Television Stations

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

New York State DOT-Regions 5 & 6
NYSDOT- Regions 5 & 6 TMCs

------------------- Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

resource deployment status
road network conditions
incident information

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

traffic control coordination
traffic information coordination

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

---------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Permit Information

PennDOT Central-Motor Carrier Division
PennDOT Central Automatic Permit, Routing, and Analysis System (APRAS)

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central-Bureau of Highwa...
PennDOT Central Crash Information System and Analysis

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

resource deployment status
road network conditions
incident information

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Rail Operators
Rail Operation Centers

railroad advisories
railroad schedules
hri advisories

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Bureau of State Parks
State and National Parks

---------- Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- resource deployment status
- road network conditions
- incident information

Towing Companies
Tow Dispatch

Planned
PennDOT 2-0 Traffic Section Kiosks Interconnect Diagram

- County Emergency Communications ...
  - Local 911 Centers

- Concierge Service Provider
  - Concierge Service Center

- PennDOT Engineering District 2-0
  - PennDOT 2-0 Web Page and Media

- Planned

- PennDOT Engineering District 2-0
  - PennDOT 2-0 Traffic Section Kiosks
County Emergency Communications ... Local 911 Centers

- alarm notification
- secure area sensor data
- secure area surveillance data
- alarm acknowledge
- secure area sensor control
- secure area surveillance control

PennDOT Engineering District 2-0
PennDOT 2-0 Traffic Section Kiosks

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- traveler request
- trip confirmation
- trip request
- interactive traveler information
- trip plan

PennDOT Engineering District 2-0
PennDOT 2-0 Traffic Section Kiosks

----------- Planned
PennDOT 2-0 Web Page and Media Interconnect Diagram

1. **PennDOT Engineering District 2-0**
   - PennDOT 2-0 Traffic Section Kiosks

2. **Travelers**
   - User Personal Computing Devices

3. **PennDOT Engineering District 2-0**
   - PennDOT 2-0 TMC

4. **PennDOT Engineering District 2-0**
   - PennDOT 2-0 Web Page and Media

5. **Planned**

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PennDOT District 2-0 ITS Architecture Region

Regional ITS Architecture

580
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

PennDOT Engineering District 2-0
PennDOT 2-0 Web Page and Media

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 Web Page and Media

- traveler request
- trip confirmation
- trip request
- interactive traveler information
- trip plan

PennDOT Engineering District 2-0
PennDOT 2-0 Traffic Section Kiosks

________________________  Planned
Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

PennDOT Engineering District 2-0
PennDOT 2-0 Web Page and Media

Planned
PennDOT 9-0 Construction Interconnect Diagram

PennDOT Engineering District 9-0
  PennDOT 9-0 TMC

PennDOT Engineering District 9-0
  PennDOT 9-0 Construction

Existing
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Closure Coordination (reverse)
- equipment maintenance status
- maint and constr resource response
- work zone information
- field equipment status
- maint and constr resource request
- work plan feedback

Existing
Planned
PennDOT 9-0 Field Equipment (Blair County) Interconnect Diagram

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2 (Blair County)

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

PennDOT Engineering District 9-0
PennDOT 9-0 Field Equipment (Blair County)

Existing
Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- environmental conditions data
- freeway control status
- roadway information system status
- traffic flow
- traffic images
- environmental sensors control
- freeway control data
- roadway information system data
- speed monitoring control
- traffic sensor control
- video surveillance control

Existing
Planned

PennDOT Engineering District 9-0
PennDOT 9-0 Field Equipment (Blair County)
PennDOT Engineering District 9-0
PennDOT 9-0 Field Equipment (Blair County)

Environmental sensors control
Environmental sensor data

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2 (Blair County)

Planned
PennDOT 9-0 Maintenance District 9-2 (Blair County) Interconnect Diagram

- PennDOT Engineering District 9-0
  - PennDOT 9-0 Maintenance District 9-2 Vehicles

- PennDOT Engineering District 2-0
  - PennDOT 2-0 Field Equipment

- PennDOT Engineering District 9-0
  - PennDOT 9-0 Maintenance District 9-2 (Blair County)

- PennDOT Engineering District 9-0
  - PennDOT 9-0 Field Equipment (Blair County)

- PennDOT Engineering District 9-0
  - PennDOT 9-0 TMC
PennDOT Engineering District 2-0
PennDOT 2-0 Field Equipment

- environmental sensors control
- environmental sensor data

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2
(Blair County)

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 Field Equipment (Blair County)

environmental sensors control
environmental sensor data

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2 (Blair County)

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2
(Blair County)

Road and Lane Closure Plans

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2
Vehicles

Existing
PennDOT 9-0 Maintenance District 9-2 Vehicles Interconnect Diagram

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2 (Blair County)

Existing
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Road and Lane Closure Plans

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2
(Blair County)

Existing

PennDOT Engineering District 9-0
PennDOT 9-0 Maintenance District 9-2
Vehicles
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

archive requests
archive status
road network conditions
traffic archive data
traffic control coordination
traffic information coordination

PennDOT Central-Bureau of Highwa...
Advanced Traveler Information and Resource Center (ATIRC)

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

AMTRAN
AMTRAN Bus Operation Center

- transit demand management response
- transit system data
- request transit information
- road network conditions
- transit demand management request

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

AHS status
archive requests
archive status
environmental conditions data
freeway control status
hov data
hri data
intersection blockage notification
request for right-of-way
reversible lane status
roadway information system status
signal control status
speed monitoring information
traffic flow
traffic images
traffic probe data
vehicle emissions data
AHS control information
environmental sensors control
freeway control data
hri control data
hri request
roadway information system data
signal control data
speed monitoring control
traffic archive data
traffic sensor control
video surveillance control
traffic control coordination
traffic information coordination

Archived Data Users
Archived Data User System

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- fare and price information
- logged vehicle routes
- road network traffic probe data
- road network conditions

Concierge Service Provider
Concierge Service Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

HAZMAT Response Teams
HAZMAT Cleanup

- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Emergency traffic control request
Incident response status
Remote surveillance control
Resource request
Emergency traffic control information
Resource deployment status
Road network conditions
Traffic images
Incident information

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local County Emergency Management Agencies

- Emergency traffic control request
- Incident response status
- Remote surveillance control
- Resource request
- Emergency traffic control information
- Resource deployment status
- Road network conditions
- Traffic images
- Incident information

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- emergency traffic control information
- request for enforcement
- resource deployment status
- road network conditions
- traffic images
- traffic violation notification
- incident information

Local Police Departments
Local Police Dispatch

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local Municipalities in Study Area
Local Traffic Signal Control Systems

traffic control coordination
traffic information coordination

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

North Central Pennsylvania Regional ...
Mapping, Addressing, and Internet Mapping

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Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Local Media
Newspaper, Radio, Television Stations

External reports
Road network conditions

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

traffic control coordination
traffic information coordination

PennDOT Engineering Districts 1-0, ...
PennDOT 1-0, 3-0, 8-0, and 10-0 TMCs

-------------------- Planned
PennDOT Engineering District 9-0

PennDOT 9-0 TMC

- environmental conditions data
- freeway control status
- roadway information system status
- traffic flow
- traffic images
- environmental sensors control
- freeway control data
- roadway information system data
- speed monitoring control
- traffic sensor control
- video surveillance control

PennDOT Engineering District 2-0

PennDOT 2-0 Field Equipment

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Traffic control coordination
Traffic information coordination

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

qualified environmental conditions data
weather information
environmental conditions data

Weather Information Service Providers
Weather Information Service

------------------------ Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- fare and price information
- logged vehicle routes
- road network traffic probe data
- road network conditions

Planned

PennDOT Engineering District 9-0
PennDOT 9-0 Web Page and Media
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0

- archive requests
- archive status
- Closure Coordination (reverse)
- equipment maintenance status
- maint and constr resource response
- work zone information
- field equipment status
- maint and constr resource request
- traffic archive data
- work plan feedback

PennDOT Central-Bureau of Maintenance

- Planned

PennDOT BOMO Traffic Control Center (TCC)
PennDOT Engineering District 9-0

PennDOT 9-0 TMC

Permit Information

PennDOT Central-Motor Carrier Division

PennDOT Central Automatic Permit, Routing, and Analysis System (APRAS)

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central-Bureau of Highway...
PennDOT Central Crash Information System and Analysis

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

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archive requests
archive status
traffic archive data

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

___________________________  Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- traffic violation notification
- incident information

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

------- Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Rail Operators
Rail Operation Centers

railroad advisories
railroad schedules
hri advisories

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

event plans
event confirmation

Bureau of State Parks
State and National Parks

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Event plans
Event confirmation

Convention and Visitors Bureaus
Tourists Information Services

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Emergency traffic control request
Incident response status
Remote surveillance control
Resource request
Resource deployment status
Incident information
Traffic images
Road network conditions
Emergency traffic control information

Towing Companies
Tow Dispatch

Planned
PennDOT 9-0 Traffic Section Kiosks Interconnect Diagram

- County Emergency Communications ...
  - Blair County 911 Center

- Concierge Service Provider
  - Concierge Service Center

- PennDOT Engineering District 9-0
  - PennDOT 9-0 Web Page and Media

- Planned

- PennDOT Engineering District 9-0
  - PennDOT 9-0 Traffic Section Kiosks
Concierge Service Provider
Concierge Service Center

- trip confirmation
- trip request
- trip plan

PennDOT Engineering District 9-0
PennDOT 9-0 Traffic Section Kiosks

______________________ Planned
County Emergency Communications ...
Blair County 911 Center

- alarm notification
- secure area sensor data
- secure area surveillance data
- alarm acknowledge
- secure area sensor control
- secure area surveillance control

PennDOT Engineering District 9-0
PennDOT 9-0 Traffic Section Kiosks

Planned
PennDOT 9-0 Web Page and Media Interconnect Diagram

PennDOT Engineering District 9-0
PennDOT 9-0 Traffic Section Kiosks

Travelers
User Personal Computing Devices

PennDOT Engineering District 9-0
PennDOT 9-0 Web Page and Media

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Planned
PennDOT Engineering District 9-0

Planned

- fare and price information
- logged vehicle routes
- road network traffic probe data
- road network conditions

PennDOT 9-0 TMC

PennDOT Engineering District 9-0

PennDOT 9-0 Web Page and Media
PennDOT Engineering District 9-0
PennDOT 9-0 Web Page and Media

- trip confirmation
- trip request
- trip plan

——— Planned

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PennDOT Engineering District 9-0
PennDOT 9-0 Traffic Section Kiosks
Travelers
User Personal Computing Devices

- broadcast traveler information
- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

PennDOT Engineering District 9-0
PennDOT 9-0 Web Page and Media

Planned
PennDOT BOMO Traffic Control Center (TCC) Interconnect Diagram

- Archived Data Users
  - Archived Data User System

- PennDOT Central-Bureau of Highways...
  - Advanced Traveler Information and Resource Center (ATIRC)

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- PennDOT Central-Bureau of Maintenance...
  - PennDOT BOMO Traffic Control Center (TCC)

- PennDOT Engineering District 9-0
  - PennDOT 9-0 TMC

Planned
Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

PennDOT Central-Bureau of Maintenance...
PennDOT BOMO Traffic Control Center (TCC)

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central-Bureau of Maintenance...
PennDOT BOMO Traffic Control Center (TCC)

Planned
PennDOT Central Automatic Permit, Routing, and Analysis System (APRAS) Interconnect Diagram

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

PennDOT Central-Motor Carrier Division
PennDOT Central Automatic Permit, Routing, and Analysis System (APRAS)

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Central-Motor Carrier Division
PennDOT Central Automatic Permit, Routing, and Analysis System (APRAS)

Permit Information

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Permit Information

PennDOT Central-Motor Carrier Division
PennDOT Central Automatic Permit, Routing, and Analysis System (APRAS)

Planned
PennDOT Central Crash Information System and Analysis Interconnect Diagram

Local Police Departments
Local Police Crash Reporting System

Archived Data Users
Archived Data User System

PennDOT Central-Bureau of Highways
Advanced Traveler Information and Resource Center (ATIRC)

PennDOT Central-Bureau of Highways
PennDOT Central Crash Information System and Analysis

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central-Bureau of Highway...
PennDOT Central Crash Information System and Analysis

Planned
PennDOT Central-Bureau of Highway...
Advanced Traveler Information and Resource Center (ATIRC)

Planed
Archived Data Users
Archived Data User System

Planned
PennDOT Central-Bureau of Highways
PennDOT Central Crash Information System and Analysis

Emergency archive data
Archive requests
Archive status

Local Police Departments
Local Police Crash Reporting System

Planned
PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

roadside archive data
data collection and monitoring control

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Field Equipment

Planned
PennDOT Central-Bureau of Highways
Advanced Traveler Information and Resource Center (ATIRC)

- archive requests
- archive status
- traffic archive data
- traveler archive data
- archive coordination

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

____________________ Planned
Archived Data Users
Archived Data User System

archive analysis results
archive request confirmation
archived data products
archive analysis requests
archived data product requests

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

archive requests
archive status
traffic archive data

PennDOT Central-Bureau of Highwa...
PennDOT Central Crash Information System and Analysis

Planned
PennDOT Central Traffic Analysis Unit Field Equipment Interconnect Diagram

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Center

------------------------- Planned

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit Field Equipment
PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit
Center

roadside archive data
data collection and monitoring control

PennDOT Central - Bureau of Planning...
PennDOT Central Traffic Analysis Unit
Field Equipment

Planned
Pennsylvania State Police Highway Dispatch Center Interconnect Diagram
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local Media
Newspaper, Radio, Television Stations

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

incident information for media

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

incident report
incident response coordination
resource coordination

PA Emergency Management Agency ...
PA Emergency Management Agency (PEMA)

--------------------- Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

resource deployment status
road network conditions
incident information

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

_________________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- emergency traffic control request
- incident response status
- remote surveillance control
- resource request
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- traffic violation notification
- incident information

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

incident information

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- incident report
- incident response coordination
- resource coordination

HAZMAT Response Teams
HAZMAT Cleanup

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

- incident report
- incident response coordination
- resource coordination

Local HAZMAT Mitigation
HAZMAT Mitigation/Containment

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Local County Emergency Management Agencies

incident report
incident response coordination
resource coordination

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Hazmat information
Hazmat information request

Local Fleet and Freight Management ...
Local Fleet and Freight Management Systems

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

North Central Pennsylvania Regional...
Mobile Voice/Data Radio Network

incident notification
incident notification response

Planned
PennDOT Central-Bureau of Highways
Advanced Traveler Information and Resource Center (ATIRC)

emergency archive data
emergency traffic control request
incident response status
remote surveillance control
resource request
archive requests
archive status
emergency traffic control information
resource deployment status
incident information

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Weather Information Service Providers
Weather Information Service

weather information

Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

_________________ Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

incident status
emergency dispatch requests

Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Towing Companies
Tow Dispatch Vehicles

incident status
emergency dispatch requests

Planned
Pennsylvania State Police Patrol Vehicles Interconnect Diagram

- **County Emergency Communications**
  - Blair County 911 Center

- **Local Municipalities in Study Area**
  - Local Traffic Signal Equipment

- **Pennsylvania State Police (PSP)**
  - Pennsylvania State Police Patrol Vehicles

- **Local 911 Centers**
  - Local Municipalities in Study Area

- **Pennsylvania State Police Highway Dispatch Center**

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

- Emergency dispatch requests
- Incident status

County Emergency Communications ...
Local 911 Centers

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

Local signal preemption request

Local Municipalities in Study Area
Local Traffic Signal Equipment

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

emergency dispatch requests
incident status

County Emergency Communications ...
Blair County 911 Center

Planned
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

incident status
emergency dispatch requests

Pennsylvania State Police (PSP)
Pennsylvania State Police Patrol Vehicles

Planned
PSU Athletic Sports Information Office Interconnect Diagram

- Penn State University-Department of ...
  - PSUTS TMC

- Centre Area Transportation Authority ...
  - CATA Bus Operations Center

- Penn State University Athletics
  - PSU Athletic Sports Information Office

- Concierge Service Provider
  - Concierge Service Center

Planned connections between the entities.
Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

Penn State University Athletics
PSU Athletic Sports Information Office

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

parking information

Penn State University Athletics
PSU Athletic Sports Information Office

Planned
PSU Construction and Maintenance Interconnect Diagram

Penn State University Office of Physiology
PSU Construction and Maintenance

Penn State University-Department of ... PSUTS TMC

Planned
Penn State University Office of Physi...
PSU Construction and Maintenance

field equipment status
-maint and constr resource request
-work plan feedback
-Closure Coordination (reverse)
equipment maintenance status
-maint and constr resource response
-work zone information

Penn State University-Department of ...
PSUTS TMC

Planned
PSU Field Sensors Interconnect Diagram

Penn State University (PTI)
PSU Field Sensors

------------------------ Planned

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITransS)
Penn State University (PTI)
PSU Field Sensors

data collection and monitoring control
roadside archive data

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITranS)

Planned
PSUTS DMS Interconnect Diagram

Penn State University-Department of ...
PSUTS DMS

Penn State University-Department of ...
PSUTS TMC

Planned
PSUTS Fleet Operations Interconnect Diagram

- Penn State University-Department of ...
  - PSUTS TMC

- Penn State University-Department of ...
  - PSUTS Parking Office and Event Coordinator

- Penn State University-Department of ...
  - PSUTS Fleet Operations

- PennDOT Engineering District 2-0
  - PennDOT 2-0 TMC

- Centre Area Transportation Authority ...
  - CATA Bus Operations Center

Planned
Centre Area Transportation Authority ... 
CATA Bus Operations Center

transit service coordination
transit traveler information coordination

Penn State University-Department of ... 
PSUTS Fleet Operations

Planned
Penn State University-Department of ...
PSUTS Fleet Operations

request transit information
- road network conditions
- traffic control priority status
- transit demand management request
- traffic control priority request
- transit demand management response
- transit system data

Penn State University-Department of ...
PSUTS TMC

-------------------------------------- Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Penn State University-Department of ...
PSUTS Fleet Operations

Planned
Penn State University-Department of ...
PSUTS Fleet Operations

- demand response passenger and use data
- transit vehicle loading data
- transit vehicle operator information

Penn State University-Department of ...
PSUTS Fleet Transit Vehicles

------------------------ Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Planning information

Penn State University-Department of ...
PSUTS Fleet Operations

_________________________  Planned
PSUTS Fleet Transit Vehicles Interconnect Diagram

Penn State University-Department of ...
PSUTS Fleet Operations

Planned

Penn State University-Department of ...
PSUTS Fleet Transit Vehicles
Penn State University-Department of ...
PSUTS Fleet Operations

- demand response passenger and use data
- transit vehicle loading data
- transit vehicle operator information

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PSUTS Fleet Transit Vehicles

Planned
PSUTS Parking Office and Event Coordinator Interconnect Diagram

- Other Parking System Operators
  - Other Parking Management Systems in the Study Area
- Penn State University-Department of...
  - PSUTS Shuttle Service
  - PSUTS TMC
- Penn State University-Department of...
  - PSUTS Parking Office ISP
  - PSUTS Parking Office and Event Coordinator
- Penn State University-Department of...
  - PSUTS Fleet Operations
- State College Borough
  - State College Borough Parking System
- Local County Planning Commissions
  - County Planning Commission
- Regional MPO/LDD
  - Regional Transportation Planning and Development Programs
- Financial Institutions
  - Financial Institutions
- Concierge Service Provider
  - Concierge Service Center
- Centre Area Transportation Authority...
  - CATA Bus Operations Center
- Planned
Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

archive requests
archive status
parking archive data

Local County Planning Commissions
County Planning Commission

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Other Parking System Operators
Other Parking Management Systems in the Study Area

parking coordination

Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

parking information

Penn State University-Department of ...
PSUTS Fleet Operations

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PSUTS Parking Office and Event Coordinator

Parking coordination

State College Borough
State College Borough Parking System

Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Parking information

Penn State University-Department of ...
PSUTS Shuttle Service

Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

- event confirmation
- parking demand management request
- parking lot inputs
- event plans
- parking demand management response
- parking information

Penn State University-Department of ...
PSUTS TMC

Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

- parking lot data request
- parking reservations request
- parking information
- parking lot reservation confirmation

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
PSUTS Parking Office ISP Interconnect Diagram

- Penn State University-Department of ... PSUTS TMC
- State College Borough State College Borough Parking System
- Concierge Service Provider Concierge Service Center
- Planned

- Penn State University-Department of ... PSUTS Parking Office ISP
- Centre Area Transportation Authority ... CATA Bus Operations Center
- Penn State University-Department of ... PSUTS Parking Office and Event Coordinator
- Penn State University-Department of ... PSUTS Parking Office Kiosks
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Centre Area Transportation Authority ...
CATA Bus Operations Center

- demand responsive transit request
- selected routes
- transit information request
- demand responsive transit plan
- transit and fare schedules
- transit incident information
- transit request confirmation

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

ISP coordination

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

State College Borough
State College Borough Parking System

- parking lot data request
- parking reservations request
- parking information
- parking lot reservation confirmation

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

- parking lot data request
- parking reservations request
- parking information
- parking lot reservation confirmation

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Penn State University-Department of ...
PSUTS Parking Office Kiosks

- broadcast traveler information
- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Penn State University-Department of ...
PSUTS Parking Office ISP

- road network conditions
- fare and price information
- logged vehicle routes
- road network traffic probe data

-- Planned

Penn State University-Department of ...
PSUTS TMC
PSUTS Parking Office Kiosks Interconnect Diagram

Penn State University-Department of ...
PSUTS Parking Office ISP

Concierge Service Provider
Concierge Service Center

Penn State University-Department of ...
PSUTS Parking Office Kiosks

Planned
PSUTS Parking Office Kiosks

- broadcast traveler information
- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

PSUTS Parking Office ISP

Planned
Concierge Service Provider
Concierge Service Center

- trip confirmation
- trip request
- trip plan

Penn State University-Department of ...
PSUTS Parking Office Kiosks

------------------------ Planned

Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

parking information

Penn State University-Department of ...
PSUTS Shuttle Service

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

road network conditions

Penn State University-Department of ...
PSUTS Shuttle Service

__________________________ Planned
Penn State University-Department of...
PSUTS Shuttle Service

transit vehicle location data
transit vehicle schedule performance

PSUTS Shuttle Service Vehicles

Planned
PSUTS Shuttle Service Vehicles Interconnect Diagram

Penn State University-Department of ...
PSUTS Shuttle Service

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Planned

Penn State University-Department of ...
PSUTS Shuttle Service Vehicles
Penn State University-Department of ...
PSUTS Shuttle Service

transit vehicle location data
transit vehicle schedule performance

Penn State University-Department of ...
PSUTS Shuttle Service Vehicles

Planned
PSUTS TMC Interconnect Diagram

- Penn State University-Department of ... PSUTS Shuttle Service
- Penn State University-Department of ... PSUTS DMS
- Penn State University Office of Physi...
- PSU Construction and Maintenance
- Penn State University-Department of ... PSUTS Parking Office ISP
- Penn State University-Department of ... PSUTS TMC
- Penn State University-Department of ... PSUTS Fleet Operations
- Penn State University Athletics
- PSU Athletic Sports Information Office
- Penn State University-Department of ... PSUTS Parking Office and Event Coordinator
- Centre Area Transportation Authority ... CATA Bus Operations Center
- PennDOT Engineering District 2-0 PennDOT 2-0 TMC
- Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

request transit information
road network conditions
traffic control priority status
transit demand management request
traffic control priority request
transit demand management response
transit system data

Penn State University-Department of ...
PSUTS TMC

---------------------------------- Planned
Penn State University Athletics
PSU Athletic Sports Information Office

- event confirmation
- parking demand management request
- parking lot inputs
- event plans
- parking demand management response
- parking information

Penn State University-Department of...
PSUTS TMC

Planned
Regional ITS Architecture

PennDOT District 2-0 ITS Architecture Region

Penn State University Office of Physics and Engineering
PSU Construction and Maintenance

- Field equipment status
- Maintain and constr resource request
- Work plan feedback
- Closure Coordination (reverse)
- Equipment maintenance status
- Maintain and constr resource response
- Work zone information

Penn State University-Department of...
PSUTS TMC

Planned
Penn State University-Department of...
PSUTS Fleet Operations

- request transit information
- road network conditions
- traffic control priority status
- transit demand management request
- traffic control priority request
- transit demand management response
- transit system data

---------------------------------- Planned

Penn State University-Department of...
PSUTS TMC
PSUTS Parking Office and Event Coordinator

- event confirmation
- parking demand management request
- parking lot inputs
- event plans
- parking demand management response
- parking information

PSUTS TMC

Planned
Penn State University-Department of ...
PSUTS Parking Office ISP

road network conditions
fare and price information
logged vehicle routes
road network traffic probe data

Planned

Penn State University-Department of ...
PSUTS TMC
Penn State University-Department of ...
PSUTS TMC

- traffic control priority request
- transit demand management response
- transit system data
- request transit information
- road network conditions
- traffic control priority status
- transit demand management request

PSUTS Shuttle Service

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

traffic control coordination
traffic information coordination

Penn State University-Department of ...
PSUTS TMC

Planned
Rail Operation Centers Interconnect Diagram

- **County Emergency Communications ...**
  - Clinton County 911 - RR Operations Coordination

- **PennDOT Central-Bureau of Highways...**
  - Advanced Traveler Information and Resource Center (ATIRC)

- **PennDOT Engineering District 9-0**
  - PennDOT 9-0 TMC

- **Rail Operators**
  - Rail Operation Centers

- **County Emergency Communications ...**
  - Local 911 Centers

- **PennDOT Engineering District 2-0**
  - PennDOT 2-0 TMC

The diagrams show existing and planned connections with different colors for each type of connection.
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Rail Operators
Rail Operation Centers

railroad advisories
railroad schedules
hri advisories

Planned
PennDOT Central-Bureau of Highway...
Advanced Traveler Information and Resource Center (ATIRC)

- railroad advisories
- railroad schedules
- hri advisories

Rail Operators
Rail Operation Centers

Planned
Rail Operators
Rail Operation Centers

- hri advisories
- railroad advisories
- railroad schedules

County Emergency Communications ...
Clinton County 911 - RR Operations Coordination

------------------ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Rail Operations
Rail Operation Centers

↑ Disaster Information

County Emergency Communications ...
Local 911 Centers

Existing
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Rail Operators
Rail Operation Centers

railroad advisories
railroad schedules
hri advisories

Planned
Regional Emergency Medical Services Coordination Interconnect Diagram

- County Emergency Communications ...
  - Blair County 911 Center

- Local County Emergency Management Agencies

- Regional EMS Councils
  - Regional Emergency Medical Services Coordination

- Archived Data Users
  - Archived Data User System

- County Emergency Communications ...
  - Local 911 Centers

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Local County Emergency Management Agencies

- archive requests
- archive status
- emergency archive data
- incident report
- incident response coordination
- resource coordination

Regional EMS Councils
Regional Emergency Medical Services Coordination

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Regional EMS Councils
Regional Emergency Medical Services Coordination

Planned
Regional EMS Councils
Regional Emergency Medical Services Coordination

- Emergency archive data
- Archive requests
- Archive status
- Incident report
- Incident response coordination
- Resource coordination

County Emergency Communications ...
Blair County 911 Center

Planned
Regional EMS Councils
Regional Emergency Medical Services Coordination

- emergency archive data
- archive requests
- archive status
- incident report
- incident response coordination
- resource coordination

County Emergency Communications ...
Local 911 Centers

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

- archive requests
- archive status
- transit archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

archive requests
archive status
transit archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Economic Development Organizations
Local Chambers of Commerce &
Economic Development Organizations

archive requests
archive status
other data source archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
North Central Pennsylvania Regional ... Mapping, Addressing, and Internet Mapping

Regional MPO/LDD
Regional Transportation Planning and Development Programs

map update request
map updates

Planned
Regional MPO/LDD
Regional Transportation Planning and Development Programs

Other Parking System Operators
Other Parking Management Systems in the Study Area

- parking archive data
- archive requests
- archive status

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Regional MPO/LDD
Regional Transportation Planning and Development Programs

archive requests
archive status
traffic archive data

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

- archive requests
- archive status
- traffic archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Penn State University-Department of...
PSUTS Parking Office and Event Coordinator

- archive requests
- archive status
- parking archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

_________________________ Planned
Regional MPO/LDD
Regional Transportation Planning and Development Programs

- transit archive data
- archive requests
- archive status

AMTRAN
AMTRAN Bus Operation Center

Planned
Archived Data Users

Archived Data User System

- Archive analysis results
- Archive request confirmation
- Archived data products
- Archive analysis requests
- Archived data product requests

Regional MPO/LDD

Regional Transportation Planning and Development Programs

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Area Transportation Authority of Nort...
ATA Transit Operations Center

archive requests
archive status
transit archive data

Regional MPO/LDD
Regional Transportation Planning and Development Programs

_________________________ Planned
Regional MPO/LDD
Regional Transportation Planning and Development Programs

- parking archive data
- archive requests
- archive status

University Park Airport Management
University Park Airport Parking

Planned
Regional Wireless Data Network Interconnect Diagram

County Emergency Communications ...
Local 911 Centers

North Central Pennsylvania Regional ...
Regional Wireless Data Network

Planned
County Emergency Communications ...
Local 911 Centers

incident notification
incident notification response

North Central Pennsylvania Regional ...
Regional Wireless Data Network

Planned
State and National Parks Interconnect Diagram

County Emergency Communications ...
  Blair County 911 Center

PennDOT Engineering District 2-0
  PennDOT 2-0 TMC

Bureau of State Parks
  State and National Parks

County Emergency Communications ...
  Local 911 Centers

PennDOT Engineering District 9-0
  PennDOT 9-0 TMC

Planned
Bureau of State Parks
State and National Parks

County Emergency Communications ...
Blair County 911 Center

event confirmation
event plans

Planned
Bureau of State Parks
State and National Parks

event confirmation

event plans

County Emergency Communications ...
Local 911 Centers

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

event plans
event confirmation

Bureau of State Parks
State and National Parks

Planned
State College Borough
State College Borough Parking System

- parking lot data request
- parking reservations request
- parking information
- parking lot reservation confirmation

Penn State University-Department of ...
PSUTS Parking Office ISP

Planned
Concierge Service Provider
Concierge Service Center

parking information
parking lot reservation confirmation
parking lot data request
parking reservations request

State College Borough
State College Borough Parking System

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

- Financial Institutions
- Financial Institutions

- Payment request
- Transaction status

- State College Borough
- State College Borough Parking System

Planned
Penn State University-Department of ...
PSUTS Parking Office and Event Coordinator

Parking coordination

State College Borough
State College Borough Parking System

Planned
Tourists Information Services Interconnect Diagram

County Emergency Communications ...
Local 911 Centers

PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Concierge Service Provider
Concierge Service Center

Convention and Visitors Bureaus
Tourists Information Services

PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

- event plans
- event confirmation

Convention and Visitors Bureaus
Tourists Information Services

---------------------- Planned
Convention and Visitors Bureaus
Tourists Information Services

- event confirmation
- event plans

County Emergency Communications ...
Local 911 Centers

Planned
Tow Dispatch Interconnect Diagram

- **Existing**
  - Towing Companies
    - Tow Dispatch Vehicles
  - PennDOT Engineering District 2-0
    - PennDOT 2-0 TMC
  - Towing Companies
    - Tow Dispatch
  - PennDOT Engineering District 9-0
    - PennDOT 9-0 TMC

- **Planned**
  - County Emergency Communications ...
    - Local 911 Centers
PennDOT Engineering District 9-0

PennDOT 9-0 TMC

Towing Companies

Tow Dispatch

- emergency traffic control request
- response status
- remote surveillance control
- resource request
- emergency traffic control information
- resource deployment status
- road network conditions
- traffic images
- incident information

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Towing Companies
Tow Dispatch

incident report
incident response coordination
resource coordination

County Emergency Communications...
Local 911 Centers

Planned
PennDOT Engineering District 2-0
PennDOT 2-0 TMC

Resource deployment status
Road network conditions
Incident information

Towing Companies
Tow Dispatch

Planned
Towing Companies
Tow Dispatch

incident status
emergency dispatch requests

Towing Companies
Tow Dispatch Vehicles

Existing
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Tow Dispatch Vehicles Interconnect Diagram

- County Emergency Communications ...
  - Blair County 911 Center

- Pennsylvania State Police (PSP)
  - Pennsylvania State Police Highway Dispatch Center

- Local Police Departments
  - Local Police Dispatch

- Towing Companies
  - Tow Dispatch Vehicles

- Existing
- Planned

- Towing Companies
  - Tow Dispatch
Pennsylvania State Police (PSP)
Pennsylvania State Police Highway Dispatch Center

Towing Companies
Tow Dispatch Vehicles

incident status
emergency dispatch requests

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Towing Companies
Tow Dispatch Vehicles

County Emergency Communications ...
Blair County 911 Center

emergency dispatch requests
incident status

------------------------
Planned
Towing Companies
Tow Dispatch Vehicles

- emergency dispatch requests
- incident status

Local Police Departments
Local Police Dispatch

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Towing Companies
Tow Dispatch

incident status
emergency dispatch requests

Towing Companies
Tow Dispatch Vehicles

Existing
Transportation Research and Education Programs Interconnect Diagram

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITranS)

Archived Data Users
Archived Data User System

Planned

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)

Penn State University (PTI)
Transportation Research and Education Programs
Archived Data Users
Archived Data User System

- archive analysis results
- archive request confirmation
- archived data products
- archive analysis requests
- archived data product requests

Penn State University (PTI)
Transportation Research and Education Programs

________________________ Planned
Penn State University (PTI)
Transportation Research and Education Programs

archive requests
archive status
other data source archive data
archive coordination

Penn State University (PTI)
Center for Intelligence Transportation Systems (CITranS)

Planned
Penn State University (PTI)
Transportation Research and Education Programs

- archive requests
- archive status
- other data source archive data
- archive coordination

--- Planned

Penn State University (PTI)
Center for Traffic Operational Analysis (CTA)
University Park Airport Parking Interconnect Diagram

- Other Parking System Operators
  - Other Parking Management Systems in the Study Area

- Regional MPO/LDD
  - Regional Transportation Planning and Development Programs

- University Park Airport Management
  - University Park Airport Parking

- Local County Planning Commissions
  - County Planning Commission

- Financial Institutions
  - Financial Institutions

- Concierge Service Provider
  - Concierge Service Center

- Centre Area Transportation Authority...
  - CATA Bus Operations Center

Planned
Regional MPO/LDD
Regional Transportation Planning and Development Programs

- parking archive data
- archive requests
- archive status

University Park Airport Management
University Park Airport Parking

Planned
Centre Area Transportation Authority ...  
CATA Bus Operations Center  

↑ parking information  

University Park Airport Management  
University Park Airport Parking  

__________________________  Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

- parking information
- parking lot reservation confirmation
- parking lot data request
- parking reservations request

University Park Airport Management
University Park Airport Parking

Planned
Local County Planning Commissions
County Planning Commission

- parking archive data
- archive requests
- archive status

University Park Airport Management
University Park Airport Parking

--------------------- Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Financial Institutions
    Financial Institutions

    payment request
    transaction status

University Park Airport Management
    University Park Airport Parking

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

University Park Airport Management
University Park Airport Parking

Other Parking System Operators
Other Parking Management Systems in the Study Area

parking coordination

Planned
User Personal Computing Devices Interconnect Diagram

- County Emergency Communications ...
  - Blair County 911 Center

- Concierge Service Provider
  - Concierge Service Center

- AMTRAN
  - AMTRAN Bus Operation Center

- PennDOT Engineering District 9-0
  - PennDOT 9-0 Web Page and Media

- DuBois, Falls Creek, Sandy Townshi...
  - DuFAST Web Page

- Travelers
  - User Personal Computing Devices

- Centre Area Transportation Authority ...
  - CATA Web Page

- Area Transportation Authority of Nort...
  - ATA Web Page

- Mifflin-Juniata Area Agency on Aging...
  - Mifflin-Juniata Area Agency on Aging
    - Transit Center

- Centre Area Transportation Authority ...
  - CATA Bus Operations Center

- DuBois, Falls Creek, Sandy Townshi...
  - DuFAST Transit Office

- County Emergency Communications ...
  - Local 911 Centers

- Centre County Office of Transportatio...
  - Centre County Paratransit Services Center

- Area Transportation Authority of Nort...
  - ATA Transit Operations Center

- PennDOT Engineering District 2-0
  - PennDOT 2-0 Web Page and Media

Planned
Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Area Transportation Authority of Nort...
ATA Web Page

Planned
Travelers
User Personal Computing Devices

- emergency acknowledge
- emergency notification

County Emergency Communications ...
Blair County 911 Center

Planned
Centre Area Transportation Authority ...
  CATA Bus Operations Center

Transit information user request
  personal transit information

Travelers
  User Personal Computing Devices

Planned
Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Centre Area Transportation Authority ...
CATA Web Page

______________________ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Travelers
User Personal Computing Devices

Centre County Office of Transportation...
Centre County Paratransit Services Center

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Planned
Travelers

User Personal Computing Devices

- Interactive traveler information
- Trip plan
- Yellow pages information
- Traveler request
- Trip confirmation
- Trip request
- Yellow pages request

Concierge Service Provider

Concierge Service Center

------------------------ Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Travelers
User Personal Computing Devices

DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

personal transit information
transit information user request

Planning
Travelers
User Personal Computing Devices

DuBois, Falls Creek, Sandy Township...
DuFAST Web Page

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Travelers
User Personal Computing Devices

- emergency acknowledge
- emergency notification

County Emergency Communications ...
Local 911 Centers

Planned
Travelers
User Personal Computing Devices

personal transit information
transit information user request

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging
Transit Center

------------------- Planned
Travelers
User Personal Computing Devices

- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

PennDOT Engineering District 2-0
PennDOT 2-0 Web Page and Media

Planned
Travelers
User Personal Computing Devices

- broadcast traveler information
- interactive traveler information
- trip plan
- yellow pages information
- traveler request
- trip confirmation
- trip request
- yellow pages request

PennDOT Engineering District 9-0
PennDOT 9-0 Web Page and Media

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Travelers
User Personal Computing Devices

- personal transit information
- transit information user request

AMTRAN
AMTRAN Bus Operation Center

Planned
Travelers
User Personal Computing Devices

- personal transit information
- transit information user request

Area Transportation Authority of Nor...  
ATA Transit Operations Center

-------------------- Planned
Weather Information Service Providers
Weather Information Service

weather information

County Emergency Communications ...
Blair County 911 Center

Planned
Centre Area Transportation Authority ...
CATA Bus Operations Center

Weather Information Service Providers
Weather Information Service

weather information

Planned
Weather Information Service Providers
Weather Information Service

weather information

Centre County Office of Transportation...
Centre County Paratransit Services Center

Planned
Regional ITS Architecture
PennDOT District 2-0 ITS Architecture Region

Concierge Service Provider
Concierge Service Center

weather information

Weather Information Service Providers
Weather Information Service

Planned
DuBois, Falls Creek, Sandy Township...
DuFAST Transit Office

Weather Information Service Providers
Weather Information Service

weather information

Planned
Weather Information Service Providers
Weather Information Service

HAZMAT Response Teams
HAZMAT Cleanup

weather information

Planned
Weather Information Service Providers

Weather Information Service

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Local HAZMAT Mitigation

HAZMAT Mitigation/Containment

weather information

Planning

Planned
Weather Information Service Providers
Weather Information Service

weather information

County Emergency Communications ...
Local 911 Centers

Planned
Weather Information Service Providers
Weather Information Service

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Local County Emergency Management Agencies

------------------------- Planned

Weather Information

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Local County Emergency Management Agencies
Weather Information Service Providers
Weather Information Service

Mifflin-Juniata Area Agency on Aging,...
Mifflin-Juniata Area Agency on Aging Transit Center

weather information

Planned
PennDOT Engineering District 9-0
PennDOT 9-0 TMC

Weather Information Service Providers
Weather Information Service

qualified environmental conditions data
weather information
environmental conditions data

______________________ Planned
PennDOT Central-Bureau of Highways...
Advanced Traveler Information and Resource Center (ATIRC)

weather archive data
archive requests
archive status

Weather Information Service Providers
Weather Information Service

Planned
Area Transportation Authority of Nort...
ATA Transit Operations Center

Weather Information Service Providers
Weather Information Service

weather information

Planned