**Architecture (**<http://www.tc.gc.ca/innovation/its/eng/architecture.htm>**)**

**ITS Architecture for Canada   
Release 2.0**

The updated ITS Architecture for Canada now provides a TURBO Tool and guidelines for the development of regional ITS architectures. ITS User Services have been expanded and reorganized to reflect new services and the Border Information Flow Architecture (BIFA).

To facilitate maintenance of previously developed regional architectures, a mapping tool will be available shortly to link versions 1.1 and 2.0 of the ITS Architecture for Canada.

* [ITS Architecture for Canada Release 2.0](http://www.tc.gc.ca/innovation/its/eng/architecture/menu.htm) Image: New

Canada's ITS Plan incorporates the development of a national ITS architecture to ensure that products and services are seamlessly integrated.  The system architecture provides a unified framework for integration to guide the co-ordinated deployment of ITS programs within the public and private sectors.  It offers a starting point from which stakeholders can work together to achieve compatibility among ITS elements to ensure unified ITS deployment for a given region.

The architecture describes interaction among physical components of the transportation system including travelers, vehicles, roadside devices, and control centres.  It also describes the information and communications system requirements, how data should be shared and used, and the standards required to facilitate information sharing for ITS deployment.  Overall, the system architecture defines the functionality of ITS components and the information flows among ITS elements to achieve total system goals.

**Border Information Flow Architecture**

Transport Canada is undertaking the development  of a Border Information Flow Architecture in partnership with the Federal Highway Administration. The Architecture could help guide a deliberate effort to ensure that technology deployed at border crossings are able to interact with each other. The development of the border architecture will follow the regional ITS architecture practices widely used throughout Canada and the U.S. Federal, state and provincial agencies from both sides of the border have been actively participating in the working group.

The BIFA was completed in December 2005 and is available on-line at [www.iteris.com/itsarch/bifa/](http://www.iteris.com/itsarch/bifa/). The BIFAWG Steering Committee is continuing to lead the marketing, training and maintenance activities related to the architecture.

<http://www.tc.gc.ca/innovation/its/eng/architecture/menu.htm>

**ITS Architecture for Canada Version 2.0**

**Background**

The ITS Architecture for Canada provides a common framework for planning, defining, and integrating intelligent transportation systems.  It is a mature product that reflects the contributions of a broad cross-section of the ITS community (transportation practitioners, systems engineers, system developers, technology specialists, consultants, etc.). The architecture defines:

* The functions (e.g., gather traffic information or request a route) that are required for ITS
* The physical entities or subsystems where these functions reside (e.g., the field or the vehicle).
* The information flows and data flows that connect these functions and physical subsystems together into an integrated system.

As you navigate through the ITS Architecture for Canada additional background information is often only a click away. A comprehensive [glossary](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm) of architecture terms is on the menu and is also linked with the architecture content.

If you would prefer a summary document that you can print and read over coffee, a brief document is available that presents the [key architecture concepts](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/key_b.htm).

**Where to Start**

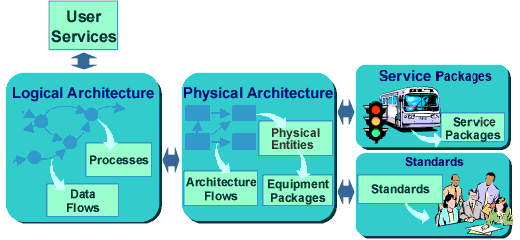
There are three ways to navigate through the ITS Architecture for Canada:

1. The [hypertext view](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/hypertext_view.htm) provides immediate, interconnected access to all the elements of the architecture definition.
2. The [document view](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/document_view.htm) presents the complete set of architecture documentation as it exists in printed format.
3. The [database view](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/database_view.htm) provides developers direct access to the source material for the ITS Architecture for Canada in several connected relational databases

http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/hypertext\_view.htm

**The Hypertext View**

The hypertext view is an interconnected presentation of the logical architecture, physical architecture, implementation, and standards- oriented components of the ITS Architecture for Canada. A variety of entry points allow you to start with any of these components. Once in, you can easily navigate from component to component to find what you need. This view of the architecture is possible because of the traceability that is maintained between each of the architecture components.



[User Services](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/user_services_list.htm) describe what the system will do from the user's perspective. To date, thirty-seven User Services have been developed. A set of requirements covering each of these User Services are the basis for the ITS Architecture for Canada definition. The User Services entry point leads you to the full set of user service requirements and allows easy traversal between the user service requirements and the components of the architecture that satisfy these requirements.

The Logical Architecture defines the [Processes](http://www.tc.gc.ca/innovation/its/eng/architecture/logical_architecture/processes/logical_architecture_processes_list.htm) (the activities or functions) that are required to satisfy the User Services.  Many different Processes must work together and share information to provide a User Service.  [Data Flows](http://www.tc.gc.ca/innovation/its/eng/architecture/logical_architecture/flows/logical_architecture_flows_list.htm) identify the information that is shared by the Processes.  These Logical Architecture entry points lead to ordered lists of processes and data flows and also allow access to data flow diagrams that provide a graphical view of how the processes and data flows fit together.

The Physical Architecture forms a high-level structure around the processes and data flows in the Logical Architecture.  The physical architecture defines the [Physical Entities](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/entities/physical_architecture_entities_list.htm) (Subsystems and Terminators) that make up an intelligent transportation system.  It defines the [Architecture Flows](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/flows/physical_architecture_flows_list.htm) that connect the various Subsystems and Terminators into an integrated system.  The subsystems generally provide a rich set of capabilities, more than would be implemented at any one place or time.   [Equipment Packages](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/equipment_packages/physical_architecture_equipment_packages_list.htm) break up the subsystems into deployment-sized pieces.  Behind these entry points are the complete definition of the Physical Architecture.  By following the links, you can traverse between the physical architecture structure and the related process and data flow requirements in the logical architecture.

[Service Packages](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/service_packages_list.htm) represent slices of the Physical Architecture that address specific services like surface street control.  A service package collects together several different subsystems, equipment packages, terminators, and architecture flows that provide the desired service.  The Service Packages entry point leads to a menu of service packages with underlying graphics and definitions.  By following the links, you can traverse to the physical and logical architecture components that are associated with each service package.

[Standards:](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/standards/standard.htm) The U.S. National ITS Architecture and the ITS Architecture for Canada are reference frameworks for the development of Standards. The Logical and Physical Architecture provide a starting point for ITS standards development activities by identifying the applicable architecture flows and data flows to be standardized and the way in which the information is exchanged across those interfaces. The Standards entry point leads to an overview of the ITS standards activities and their relationship to the ITS Architecture for Canada. [Application Areas](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/application_areas/application_areas.htm) represent deployment-oriented categories of ITS Standards and are useful to deployers to wish to select only those ITS standards relevant to the services or systems they plan to deploy

http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/document\_view.htm

**ITS Architecture for Canada Documentation**

The architecture documents make up a comprehensive and critical resource listing the different components of ITS and the many connections that unite them into an overall framework for deployment. These documents offer thousands of pages of information to help in designing intelligent transportation systems. The entire suite of core architecture documents has been updated in 2009 in coordination with the Version 2.0 update.

Version 2.0 of the ITS Architecture for Canada is the direct result of inputs from the ITS community and represents a significant re-alignment with the current U.S. National ITS Architecture (Version 6.1). Transport Canada acknowledges the U.S. Federal Highway Administration (FHWA) for kindness in sharing their wealth of architectural material. Changes were incorporated into the physical and logical architectures, and several other key architecture definition documents for this version.

The ITS Architecture for Canada document set is listed below and is available as PDF files, which may be viewed using Acrobat Reader.

## ITS Architecture for Canada Documents:

The architecture documents fall into the following categories:

**NOTE: The following documentation will be completed and available in late February 2010.**

## User Services

This one Document consolidates the descriptions of all 37 current user services into a single document. If additional ITS user services are defined in the future, this document will be updated to include them.

The ***User Services*** document provides an overview of current ITS User Services.

## Architecture Definition

There are four documents that provide architecture definition:

The **Logical Architecture** document is made up of three volumes:

* Description ***(Volume 1)***
* Process Specifications ***(Volume 2)***
* Data Dictionary ***(Volume 3)***

These present a functional view of the ITS user services, contain diagrams that show processes and data flows among them, and define data elements, respectively.

The ***Physical Architecture*** document describes the transportation and communications layers resulting from the partitioning of the processes within the logical architecture, presents architecture flow diagrams that show data passing among physical subsystems, and provides characteristics and constraints on the data flows.

The ***Service Packages*** document expands upon the Service Package discussion in the Implementation Strategy by providing a comprehensive review of each of the Service Packages describing how Service Packages can be used to plan and implement integrated transportation systems customized to local needs.

## Regional ITS Architecture Guidance (Version 2.0)

The [Regional ITS Architecture Guidance for Canada: Developing, Using and Maintaining an ITS Architecture For Your Region (Version 1.0)](http://www.tc.gc.ca/innovation/its/eng/architecture/documents/report_request.htm) is a guide for transportation professionals who are involved in the development, use, or maintenance of regional ITS architectures. The document describes a process for creating a regional ITS architecture with supporting examples of each architecture product. It describes a process for creating a regional ITS architecture with supporting examples of each product and discusses mainstreaming ITS into the planning and project development processes. This update expands upon the topics of Using and Maintaining a regional ITS architecture.

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/database_view.htm>

**ITS Architecture for Canada Databases**

The Microsoft Access databases are the basic repository for the ITS Architecture for Canada definition. These databases are the source for the architecture documents, CD-ROM, and web site products. For the experienced architecture and database user, these databases provide the most flexible and powerful way to access ITS Architecture for Canada content. Using the databases, one can generate queries and reports that extract a specific subset of the architecture and manipulate the data to tailor it for a particular application. Of course, care must be taken since it is also easy to generate invalid results without some background in the architecture definition and the underlying relational database design.

Compressed, self-extracting images of the ITS Architecture for Canada databases are at your disposal. Select a database from the table and save the self-extracting file on your hard disk or other writeable media. Execute the file by double clicking on it and then save the database "mdb" file on your hard disk or other writeable media. Once uncompressed and on your hard disk, Microsoft Access 2003 (or any other database system capable of importing the MDB format) may be used to open the databases.

The ITS Architecture for Canada databases are:

|  |  |  |
| --- | --- | --- |
| **Database** | **Description** | **Updated Date** |
| [Logical Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/databases/logical.zip) | Defines all the processes, data flows, and data stores in the Logical Architecture. | December 2009 |
| [Physical Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/databases/physical.zip) | Defines all subsystems, terminators, equipment packages, interconnects, and architecture flows in the Physical Architecture and their connection with the Logical Architecture components. | December 2009 |
| [Service Packages](http://www.tc.gc.ca/innovation/its/eng/architecture/databases/service.zip) | Defines the Service Packages and their relationship to the subsystems, terminators, equipment packages, and architecture flows in the Physical Architecture. | December 2009 |
| [SDOMAP](http://www.tc.gc.ca/innovation/its/eng/architecture/databases/sdomap.zip) | Defines the relationship between ITS standards and the Physical Architecture. Each ITS standard is identified and mapped to all related architecture flows in this database. This database includes the mapping of architecture flows that have not yet been standardized to standards development categories such as DSRC, Transit Communications, etc. | December 2009 |

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http://www.tc.gc.ca/innovation/its/eng/architecture/user\_services/user\_services\_list.htm

**User Services**

**Traveller Information:**

* 1.1 [Pre-Trip Travel Information](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr11.htm)
* 1.2 [En-Route Driver Information](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr12.htm)
* 1.3 [Route Guidance and Navigation](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr13.htm)
* 1.4 [Ride Matching And Reservation](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr14.htm)
* 1.5 [Traveller Services Information](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr15.htm)

**Traffic Management:**

* 2.1 [Traffic Control](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr21.htm)
* 2.2 [Incident Management](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr22.htm)
* 2.3 [Travel Demand Management](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr23.htm)
* 2.4 [Emissions Testing And Mitigation](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr24.htm)
* 2.5 [Highway-Rail Intersection](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr25.htm)
* 2.6 [Automated Dynamic Warning and Enforcement](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr26.htm)
* 2.7 [Non-Vehicular Road User Safety](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr27.htm)

**Public Transportation Management:**

* 3.1 [Public Transportation Management](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr31.htm)
* 3.2 [En-Route Transit Information](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr32.htm)
* 3.3 [Demand Responsive Transit](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr33.htm)
* 3.4 [Public Travel Security](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr34.htm)

**Electronic Payment:**

* 4.1 [Electronic Payment Services](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr41.htm)

**Commercial Vehicle Operations:**

* 5.1 [Commercial Vehicle Electronic Clearance](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr51.htm)
* 5.2 [Automated Roadside Safety Inspection](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr52.htm)
* 5.3 [On-Board Safety and Security Monitoring](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr53.htm)
* 5.4 [Commercial Vehicle Administrative Processes](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr54.htm)
* 5.5 [Hazardous Materials Planning and Incident Response](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr55.htm)
* 5.6 [Freight Mobility](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr56.htm)
* 5.7 [Intermodal Freight Management](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr57.htm)
* 5.8 [International Border Transportation Management](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr58.htm)

**Emergency Management:**

* 6.1 [Emergency Notification And Personal Security](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr61.htm)
* 6.2 [Emergency Vehicle Management](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr62.htm)
* 6.3 [Disaster Response And Evacuation](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr63.htm)

**Advanced Vehicle Safety Systems:**

* 7.1 [Longitudinal Collision Avoidance](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr71.htm)
* 7.2 [Lateral Collision Avoidance](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr72.htm)
* 7.3 [Intersection Collision Avoidance](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr73.htm)
* 7.4 [Vision Enhancement For Crash Avoidance](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr74.htm)
* 7.5 [Safety Readiness](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr75.htm)
* 7.6 [Pre-Crash Restraint Deployment](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr76.htm)
* 7.7 [Automated Vehicle Operation](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr77.htm)

**Information Management:**

* 8.1 [Archived Data](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr81.htm)

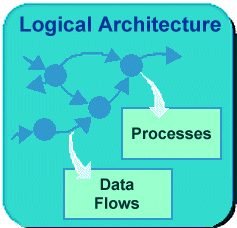
**User Services:**

* 9.1 [Maintenance And Construction Operations](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/detail/usr91.htm)

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/logical_architecture/logical_architecture.htm>

**Logical Architecture**

The Logical Architecture defines the [Processes](http://www.tc.gc.ca/innovation/its/eng/architecture/logical_architecture/processes/logical_architecture_processes_list.htm) (the activities and functions) that are required to provide the required [User Services](http://www.tc.gc.ca/innovation/its/eng/architecture/user_services/user_services_list.htm). Many different [Processes](http://www.tc.gc.ca/innovation/its/eng/architecture/logical_architecture/processes/logical_architecture_processes_list.htm) must work together and share information to provide a User Service. The Processes can be implemented via software, hardware, or firmware. The Logical Architecture is independent of technologies and implementations.



The Logical Architecture consists of Processes (defined above), Data Flows, Terminators, and data stores. [Data Flows](http://www.tc.gc.ca/innovation/its/eng/architecture/logical_architecture/flows/logical_architecture_flows_list.htm) identify the information that is shared by the Processes. The entry and exit points for the Logical Architecture are the sensors, computers, human operators of the ITS systems (called Terminators). These [Terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/entities/physical_architecture_entities_list.htm) appear in the Physical Architecture as well. Data stores are repositories of information maintained by the Processes.

The Logical Architecture is presented to the reader via [Data Flow Diagrams](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow_diagram) (DFDs) or bubble charts and Process Specifications (PSpecs).

The DFDs are graphical presentations of the Processes, Terminators, Data Flows, and Data Stores in the architecture. The DFDs are organized hierarchically starting from highest-level activity "Manage ITS". High-level activities are then decomposed functionally through multiple levels to arrive at the fundamental ITS processes and activities.

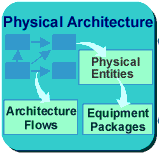
The PSpecs are textual descriptions of the most rudimentary processes in the Logical Architecture. Each PSpec description consist of an overview, a set of functional requirements, and a complete listing of inputs and outputs. A system designer can use these descriptions as a guide to writing the specifications for the systems that will implement the processes described.

The "Processes" link in the figure above presents a list of all of the DFDs and the PSpecs defined in this version of the Architecture. Also included are the [Subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/entities/physical_architecture_entities_list.htm) from the Physical Architecture that utilize the PSpecs. All of the PSpecs and Subsystem entries are hyperlinked to detailed descriptions in this document.

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/physical_architecture/physical_architecture.htm>

**Physical Architecture**

The Physical Architecture forms a high-level structure around the processes and data flows in the Logical Architecture.  The physical architecture defines the [Physical Entities](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/entities/physical_architecture_entities_list.htm) (Subsystems and Terminators) that make up an intelligent transportation system.  It defines the [Architecture Flows](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/flows/physical_architecture_flows_list.htm) that connect the various Subsystems and Terminators into an integrated system.



The subsystems generally provide a rich set of capabilities, more than would be implemented at any one place or time.  [Equipment Packages](http://www.tc.gc.ca/innovation/its/eng/architecture/physical_architecture/equipment_packages/physical_architecture_equipment_packages_list.htm) break up the subsystems into deployment-sized pieces.  The complete definition of the Physical Architecture is behind these entry points.  By following the links, you can traverse between the physical architecture structure and the related process and data flow requirements in the logical architecture.

<http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/service_packages_list.htm>

**Service Packages**

Service Packages represent slices of the Physical Architecture that address specific services like surface street control. A service package collects together several different subsystems, equipment packages, terminators, and architecture flows that provide the desired service. The table below is a menu of service packages with underlying graphics and definitions. By following the links, you can traverse to the physical and logical architecture components that are associated with each service package, as well as view the user service relationships, transportation problems addressed, and ITS Goals supported by each service package. Also, there is supporting rationale for the early deployment and rural development service packages.

|  |  |  |  |
| --- | --- | --- | --- |
| **Service Area** | **Service Package** | **Service Package Name** | **Service Package Graphic** |
| **Archived Data Management** |  |  |  |
| AD1 | [ITS Data Mart](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/ad1.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/ad1.htm) |
| AD2 | [ITS Data Warehouse](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/ad2.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/ad2.htm) |
| AD3 | [ITS Virtual Data Warehouse](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/ad3.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/ad3.htm) |
| **Public Transportation** |  |  |  |
| APTS01 | [Transit Vehicle Tracking](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts01.htm) |
| APTS02 | [Transit Fixed-Route Operations](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts02.htm) |
| APTS03 | [Demand Response Transit Operations](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts03.htm) |
| APTS04 | [Transit Fare Collection Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts04.htm) |
| APTS05 | [Transit Security](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts05.htm) |
| APTS06 | [Transit Fleet Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts06.htm) |
| APTS07 | [Multi-modal Coordination](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts07.htm) |
| APTS08 | [Transit Traveller Information](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts08.htm) |
| APTS09 | [Transit Signal Priority](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts09.htm) |
| APTS10 | [Transit Passenger Counting](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts10.htm) |
| APTS101 | [Multi-Modal Connection Protection](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/apts101.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/apts101.htm) |
| **Traveller Information** |  |  |  |
| ATIS01 | [Broadcast Traveller Information](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis01.htm) |
| ATIS02 | [Interactive Traveller Information](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis02.htm) |
| ATIS03 | [Autonomous Route Guidance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis03.htm) |
| ATIS04 | [Dynamic Route Guidance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis04.htm) |
| ATIS05 | [ISP Based Trip Planning and Route Guidance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis05.htm) |
| ATIS06 | [Transportation Operations Data Sharing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis06.htm) |
| ATIS07 | [Traveller Services Payment and Reservation](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis07.htm) |
| ATIS08 | [Dynamic Ridesharing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis08.htm) |
| ATIS09 | [In Vehicle Signing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis09.htm) |
| ATIS10 | [VII Traveller Information](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atis10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atis10.htm) |
| **Traffic Management** |  |  |  |
| ATMS01 | [Network Surveillance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms01.htm) |
| ATMS02 | [Traffic Probe Surveillance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms02.htm) |
| ATMS03 | [Surface Street Control](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms03.htm) |
| ATMS04 | [Freeway Control](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms04.htm) |
| ATMS05 | [HOV Lane Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms05.htm) |
| ATMS06 | [Traffic Information Dissemination](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms06.htm) |
| ATMS07 | [Regional Traffic Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms07.htm) |
| ATMS08 | [Traffic Incident Management System](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms08.htm) |
| ATMS09 | [Traffic Forecast and Demand Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms09.htm) |
| ATMS10 | [Electronic Toll Collection](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms10.htm) |
| ATMS101 | [Dynamic Roadway Warning](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms101.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms101.htm) |
| ATMS102 | [Signal Enforcement](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms102.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms102.htm) |
| ATMS103 | [Standard Mixed Use Warning Systems](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms103.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms103.htm) |
| ATMS104 | [Advanced Mixed Use Warning Systems](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms104.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms104.htm) |
| ATMS11 | [Emissions Monitoring and Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms11.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms11.htm) |
| ATMS12 | [Roadside Lighting System Control](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms12.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms12.htm) |
| ATMS13 | [Standard Railroad Grade Crossing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms13.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms13.htm) |
| ATMS14 | [Advanced Railroad Grade Crossing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms14.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms14.htm) |
| ATMS15 | [Multimodal Operations Coordination](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms15.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms15.htm) |
| ATMS16 | [Parking Facility Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms16.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms16.htm) |
| ATMS17 | [Regional Parking Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms17.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms17.htm) |
| ATMS18 | [Reversible Lane Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms18.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms18.htm) |
| ATMS19 | [Variable Speed Limit and Enforcement](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms19.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms19.htm) |
| ATMS20 | [Drawbridge Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms20.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms20.htm) |
| ATMS21 | [Roadway Closure Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/atms21.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/atms21.htm) |
| **Vehicle Safety** |  |  |  |
| AVSS01 | [Vehicle Safety Monitoring](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss01.htm) |
| AVSS02 | [Driver Safety Monitoring](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss02.htm) |
| AVSS03 | [Longitudinal Safety Warning](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss03.htm) |
| AVSS04 | [Lateral Safety Warning](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss04.htm) |
| AVSS05 | [Intersection Safety Warning](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss05.htm) |
| AVSS06 | [Pre-Collision Restraint Deployment](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss06.htm) |
| AVSS07 | [Driver Visibility Improvement](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss07.htm) |
| AVSS08 | [Advanced Vehicle Longitudinal Control](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss08.htm) |
| AVSS09 | [Advanced Vehicle Lateral Control](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss09.htm) |
| AVSS10 | [Intersection Collision Avoidance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss10.htm) |
| AVSS11 | [Automated Highway System](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss11.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss11.htm) |
| AVSS12 | [Cooperative Vehicle Safety Systems](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/avss12.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/avss12.htm) |
| **Commercial Vehicle Operations** |  |  |  |
| CVO01 | [Fleet Administration](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo01.htm) |
| CVO02 | [Freight Administration](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo02.htm) |
| CVO03 | [Electronic Clearance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo03.htm) |
| CVO04 | [CV Administrative Processes](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo04.htm) |
| CVO05 | [International Border Electronic Clearance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo05.htm) |
| CVO06 | [Weigh-In-Motion](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo06.htm) |
| CVO07 | [Roadside CVO Safety](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo07.htm) |
| CVO08 | [On-board CVO and Freight Safety and Security](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo08.htm) |
| CVO09 | [CVO Fleet Maintenance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo09.htm) |
| CVO10 | [Hazardous Material Planning and Incident Response](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo10.htm) |
| CVO101 | [Freight Terminal Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo101.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo101.htm) |
| CVO102 | [International Border Registration](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo102.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo102.htm) |
| CVO103 | [International Border Pre-Processing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo103.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo103.htm) |
| CVO104 | [International Border Inspection](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo104.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo104.htm) |
| CVO11 | [Roadside Hazardous Material Security Detection and Mitigation](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo11.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo11.htm) |
| CVO12 | [CV Driver Security Authentication](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo12.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo12.htm) |
| CVO13 | [Freight Assignment Tracking](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/cvo13.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/cvo13.htm) |
| **Emergency Management** |  |  |  |
| EM01 | [Emergency Call-Taking and Dispatch](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em01.htm) |
| EM02 | [Emergency Routing](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em02.htm) |
| EM03 | [Personal Security and MAYDAY Support](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em03.htm) |
| EM04 | [Roadway Service Patrols](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em04.htm) |
| EM05 | [Transportation Infrastructure Protection](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em05.htm) |
| EM06 | [Wide-Area Alert](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em06.htm) |
| EM07 | [Early Warning System](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em07.htm) |
| EM08 | [Disaster Response and Recovery](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em08.htm) |
| EM09 | [Evacuation and Reentry Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em09.htm) |
| EM10 | [Disaster Traveller Information](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/em10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/em10.htm) |
| **Maintenance and Construction Management** |  |  |  |
| MC01 | [Maintenance and Construction Vehicle and Equipment Tracking](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc01.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc01.htm) |
| MC02 | [Maintenance and Construction Vehicle Maintenance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc02.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc02.htm) |
| MC03 | [Road Weather Data Collection](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc03.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc03.htm) |
| MC04 | [Weather Information Processing and Distribution](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc04.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc04.htm) |
| MC05 | [Roadway Automated Treatment](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc05.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc05.htm) |
| MC06 | [Winter Maintenance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc06.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc06.htm) |
| MC07 | [Roadway Maintenance and Construction](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc07.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc07.htm) |
| MC08 | [Work Zone Management](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc08.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc08.htm) |
| MC09 | [Work Zone Safety Monitoring](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc09.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc09.htm) |
| MC10 | [Maintenance and Construction Activity Coordination](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc10.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc10.htm) |
| MC101 | [Roadway Micro-Prediction](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc101.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc101.htm) |
| MC11 | [Environmental Probe Surveillance](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc11.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc11.htm) |
| MC12 | [Infrastructure Monitoring](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/detail/mc12.htm) | [Click here](http://www.tc.gc.ca/innovation/its/eng/architecture/service_packages/graphic/mc12.htm) |

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/standards/standard.htm>

**ITS Standards**

ITS Standards are fundamental to the establishment of an open ITS environment. Standards facilitate deployment of interoperable systems at local, regional, and national levels without impeding innovation as technology advances and new approaches evolve.

**The Architecture and Standards**

The ITS Architecture for Canada is a reference framework that spans all of these ITS standards activities and provides a means of detecting gaps, overlaps, and inconsistencies between the standards. The Logical and Physical Architecture provide a starting point for the standards development activities by identifying the applicable architecture flows and data flows to be standardized in the ITS Architecture for Canada and the way in which the information is exchanged across those interfaces.

The following organizations participate in ITS standards activities (note linked to U.S. National ITS Architecture website):

* [AASHTO (American Association of State Highway and Transportation Officials)](http://www.iteris.com/itsarch/html/standard/aashto.htm)
* [ANSI (American National Standards Institute)](http://www.iteris.com/itsarch/html/standard/ansi.htm)
* [APTA (American Public Transportation Association)](http://www.iteris.com/itsarch/html/standard/apta.htm)
* [ASTM (American Society for Testing and Materials)](http://www.iteris.com/itsarch/html/standard/astm.htm)
* [IEEE (Institute of Electrical and Electronics Engineers)](http://www.iteris.com/itsarch/html/standard/ieee.htm)
* [ITE (Institute of Transportation Engineers)](http://www.iteris.com/itsarch/html/standard/ite.htm)
* [NEMA (National Electrical Manufacturers Association)](http://www.iteris.com/itsarch/html/standard/nema.htm)
* [SAE (Society of Automotive Engineers)](http://www.iteris.com/itsarch/html/standard/sae.htm)

Select an organization above to examine a list of ITS Standards Activities in which a particular SDO participates.  Select one of these subsequent Standards Activities or Standards Activities Groups to see the corresponding architecture flows mapped to that standard. Note that some of the standards activities are collaborative between multiple SDOs (e.g., the NTCIP Joint Steering Committee is comprised of representatives from AASHTO, ITE and NEMA).

Frequently, architecture flows are mapped to several standards because communications protocol, data dictionary, and message set standards are all required to share information between systems.  Since ITS standards development is ongoing, the standards support for some architecture flows is incomplete at this time.  For example, in some cases architecture flows are only mapped to communications protocol standards where supporting data dictionaries or message sets have not yet been created.  Only ITS standards activities that have actually been initiated are included in the mapping.

Some architecture flows, whether because they have just been added in this newest version of the ITS Architecture for Canada or just haven’t been addressed yet by the standards community, are prime [candidates for future standardization efforts](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/standards/stds_categories.htm). Standards development categories, such as Transit Communications, ATIS, DSRC, etc., have been created, and each candidate architecture flow assigned to one or more of the categories.

A final few architecture flows are not mapped to ITS standards for other reasons. In some cases, the architecture flow is supported by proprietary or non-ITS (e.g., financial institution) information that is unlikely to be standardized by the ITS community and in other cases, the architecture flow may be futuristic in nature, and unlikely to be standardized anytime soon (e.g., Automated Highway System).

To assist deployers in selecting the ITS standards most relevant to the ITS services or systems they plan to deploy, ITS Standards are grouped in categories called [Application Areas](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/application_areas/application_areas.htm). Since each application area addresses a single interface type (e.g., centre-to-centre, centre-to-field), deployers will typically implement multiple application areas to provide an ITS service.

**For More Information**

(Note: Because the links below are to the World Wide Web, you must be connected to the Web to follow them.)

The best source of information regarding ITS standards is the USDOT ITS JPO's [Standards Site](http://www.standards.its.dot.gov). In addition, there are sites that provide detail for a particular standards area, such as communication between traffic management centres and other centres, exchange of information using Dedicated Short Range Communications (DSRC), or the Commercial Vehicle Information Systems Network (CVISN).  The table below provides links to SDO home pages as well as some of those specific ITS Standards efforts.  Other organizations involved with ITS Standards development include the International Organization for Standards [(ISO)](http://www.iso.org/iso/home.htm) and the National Institute of Standards and Technology [(NIST)](http://www.nist.gov/index.html).

|  |  |  |
| --- | --- | --- |
| **Standard Development Organizations (SDO) Home Page** | **Applicable Interfaces in the ITS Architecture for Canada** | **ITS Standards Specific Sites** |
| [AASHTO](http://www.transportation.org/), [ITE](http://www.ite.org/), [NEMA](http://www.nema.org/) | Traffic Management Centre to other Centres | [National Transportation Communications for ITS Protocol(NTCIP)](http://www.ntcip.org/) |
| Traffic Management Centre to Field Devices |
| [AASHTO](http://www.transportation.org/), [ITE](http://www.ite.org/) | Traffic Management Centre to other Centres | [Traffic Management Data Dictionary (TMDD) and Message Sets](http://www.ite.org/tmdd/) |
| [ANSI](http://www.ansi.org/) | Commercial Vehicle Operations (CVO)-related system interfaces | [Commercial Vehicle Information Systems and Networks (CVISN)](http://www.fmcsa.dot.gov/facts-research/cvisn/index.htm) |
| [ASTM](http://www.astm.org/) | Archived Data Management Centre Interfaces | [Archived Data](http://www.fhwa.dot.gov/policy/ohpi/travel/adus.htm) |
| [ASTM](http://www.astm.org/), [IEEE](http://www.ieee.org/portal/site), [SAE](http://www.sae.org/) | Vehicle to Vehicle; Field to Vehicle | [Dedicated Short Range Communications (DSRC)](http://www.leearmstrong.com/DSRC/DSRCHomeset.htm) |
| [IEEE](http://www.ieee.org/portal/site) | Emergency Management Centre to other Centres | [Incident Management](http://grouper.ieee.org/groups/scc32/imwg/index.html) |
| [APTA](http://www.apta.com/Pages/default.aspx) | Transit Centre to other Centres and Transit Vehicles | [Transit Communications Interface Profiles (TCIP)](http://www.aptastandards.com/APTAStandards/tabid/36/Default.aspx) |
| [SAE](http://www.sae.org/) | Traveller Information (Information Service Provider interfaces) | Advanced Traveller Information Systems (ATIS) |
| Location Referencing |

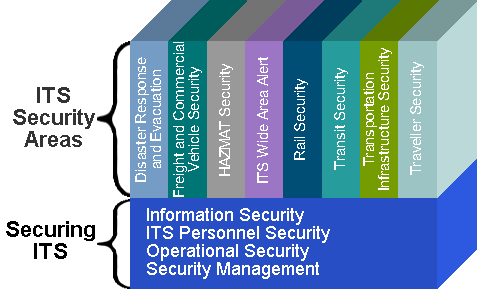
The identified web site links may change from time-to-time. A current set of links to these sites will be maintained on the U.S. National ITS Architecture web site.

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/security/security.htm>

**Security**

Security is represented in the ITS Architecture for Canada in two ways:

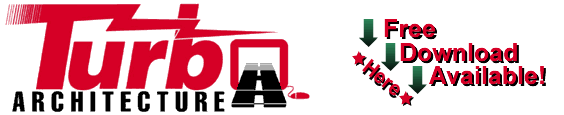
1. [Securing ITS](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/security/securing_its.htm): ITS is an information system in its own right that must be protected so that ITS applications are reliable and available when they are needed. This aspect of security applies to all the subsystems and architecture flows in the ITS Architecture for Canada. "Securing ITS" is shown as the foundation since the ITS systems must be secure before ITS can reliably be used to improve the security of the surface transportation system.
2. [ITS Security Areas](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/security/security_areas.htm): ITS can be used to enhance the security of the surface transportation system. Eight security areas define the ways that ITS can be used to detect, respond to, and recover from threats against the surface transportation system. These eight ITS security areas are shown at the top of the figure below, supported by the "Securing ITS" security services that make ITS secure. Specific subsystems, architecture flows, service packages, and supporting physical and logical architecture definitions have been defined for each ITS security area.



Consider a transit surveillance system that includes CCTV cameras and a control centre to illustrate these two views of security. From one perspective, we need to make sure that the cameras can only be controlled by the control centre, that they can’t easily be taken off-line, and that any sensitive images that may be collected are protected from unauthorized disclosure. These are all considerations associated with securing the transit surveillance system and are addressed as part of "Securing ITS". From another perspective, the transit surveillance system is an ITS system that provides both a deterrent and a response tool that improves the security of the transportation system. This view of the transit surveillance system is defined in one of the eight security areas ("Transit Security").

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/turbo/turbomain.htm>

**Turbo Architecture for Canada**

[](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/turbo/turboform.htm)

Turbo Architecture is a software application that supports development of regional and project ITS architectures using the ITS Architecture for Canada as a starting point.

**Turbo Architecture for Canada** [now available for download](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/turbo/turboform.htm), supports the ITS Architecture for Canada Version 2.0, in both English and French. Using Turbo Version for Canada, you can:

* Create 'Communications Elements' that represent communications infrastructure that supports ITS projects in your region.
* Create a set of web pages for your regional ITS architecture. Turbo provides flexibility so that you can tailor the look and content of the regional ITS architecture web pages and integrate these pages into an existing web site.
* Select from a list of most-recently-used files in the File menu to open your Turbo file quicker and easier.
* Select multiple rows on the Interfaces tab and include/uninclude the selected rows with a single click.

<http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm>

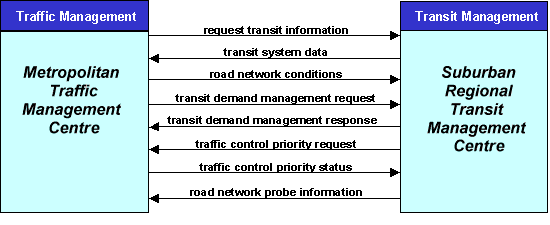
**ITS Architecture Glossary**

**Architecture**

A framework within which a [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) can be built. Requirements dictate what functionality the architecture must satisfy. An architecture functionally defines what the pieces of the system are and the information that is exchanged between them. An architecture is functionally oriented and not technology-specific which allows the architecture to remain effective over time. It defines "what must be done," not "how it will be done."

**Architecture Flow**

Information that is exchanged between subsystems and terminators in the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). Architecture flows are the primary tool that is used to define the [Regional ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture) interfaces. These architecture flows and their communication requirements define the interfaces which form the basis for much of the ongoing [standards](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#standards) work in the U.S. National ITS program. The terms "[information flow](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#information_flow)" and "architecture flow" are used interchangeably.



**Architecture Interconnect**

Communications paths that carry information between [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) and [terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator) in the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). Several different types of interconnects are defined in the ITS Architecture for Canada to reflect the range of interface requirements in ITS. The majority of the interconnects are various types of communications links that are defined in the [communications layer](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#communications_layer). Four different types of communications links are defined: [Fixed Point - Fixed Point Communications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#fixed_point_fixed_point_communications), [Wide Area Wireless (Mobile) Communications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#wide_area_wireless_mobile_communications), [Field - Vehicle Communications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#field_vehicle_communications), and [Vehicle - Vehicle Communications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#vehicle_vehicle_communications). In addition to these types, several specialized interconnects are also defined to reflect other interface requirements. These include human interface (e.g., what the system user sees and hears) and physical/environmental (e.g., what the ITS sensors sense).

**Centre Subsystems**

[Subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) that provide management, administrative, and support functions for the transportation system. The centre subsystems each communicate with other centers to enable coordination between modes and across jurisdictions. Some examples of centre subsystems are Traffic Management, Transit Management, Commercial Vehicle Administration, Archived Data Management, Emissions Management, Toll Administration, Emergency Management, Information Service Provider, and Fleet and Freight Management. One of four general subsystem classes defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Clarus System**

A network for sharing and exchanging surface weather data and relevant surface transportation conditions.

**Communications Layer**

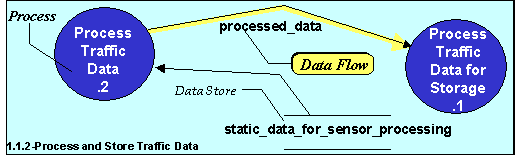
One of three layers (along with the transportation and [institutional layers](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#institutional_layer)) defined by the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). The communications layer includes all of the communications equipment (e.g., wireline and wireless transmitters and receivers) and the information management and transport capabilities necessary to transfer information among entities in the [transportation layer](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#transportation_layer). The application data content and the transportation application requirements are generally transparent to the communications layer. The communication layer's view of ITS is that of many distributed users, some of them mobile, which require communication services.

**Data Dictionary Entry**

Every [data flow](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow) included in the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) is defined in a data dictionary entry. Each data dictionary entry contains a textual description of the data flow and identifies any lower level data elements that make up the data flow.

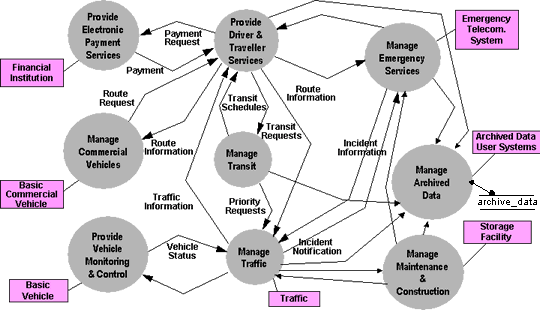
**Data Flow**

Data flows represent a pipeline along which information of known composition is passed. Data flows are modeled in the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). Data flows represent data flowing between [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) or between a process and a [terminator](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator). A data flow is shown as an arrow on a [data flow diagram](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow_diagram) and is defined in a [data dictionary entry](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_dictionary_entry) in the logical architecture. Data flows are aggregated together to form high-level [architecture flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow) in the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) view of the ITS Architecture for Canada.



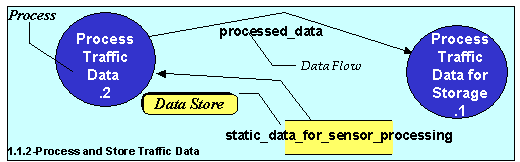
**Data Flow Diagram**

The diagrams in the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) that show the functions that are required for ITS and the information that moves between these functions. Only four different symbols are used on the diagrams. Circles represent the[processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) or functions that do the work. Arrows represent the [data flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow) that show how data moves through the [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system). Parallel lines represent [data stores](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_store) that represent "data at rest" in the system. Finally, rectangles represent the [terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator) that define the architecture boundary. A hierarchy of these diagrams depict the ITS functionality and data flow requirements in successively greater detail until "primitive" processes are defined.



**Data Store**

A data store represents a reservoir in which data can be held for an indefinite period. Data stores are shown on the [data flow diagrams](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow_diagram) where data repositories are required to support data aggregation or archival services.



**Element**

This is the basic building block of [Regional ITS Architectures](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture) and [Project ITS Architectures](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#project_its_architecture). It is the name used by [stakeholders](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#stakeholders) to describe a [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) or piece of a system.

**Equipment Package**

Equipment packages are the building blocks of the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem). Equipment Packages group similar [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) of a particular subsystem together into an “implementable” package. The grouping also takes into account the [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services) and the need to accommodate various levels of functionality. The equipment packages were used as a basis for estimating deployment costs (as part of the evaluation that was performed). Since equipment packages are both the most detailed elements of the physical architecture view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) and tied to specific [service packages](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#service_package), they provide the common link between the interface-oriented architecture definition and the deployment-oriented service packages.

**Field - Vehicle Communications**

A wireless communications channel used for close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific communications for ITS capabilities such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations. One of the types of [architecture interconnects](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Field Subsystems**

Intelligent infrastructure distributed along the transportation network which perform surveillance, information provision, and plan execution control functions and whose operation is governed by [centre subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#centre_subsystems). Field subsystems also directly interface to [vehicle subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#vehicle_subsystems). One of the four general subsystem classes defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Fixed Point - Fixed Point Communications**

A communication link serving stationary entities. It may be implemented using a variety of public or private communication networks and technologies. It can include, but is not limited to, twisted pair, coaxial cable, fiber optic, microwave relay networks, spread spectrum, etc. In Fixed Point - Fixed Point (FP2FP) communication the important issue is that it serves stationary entities. Both dedicated and shared communication resources may be used. One of the types of [architecture interconnects](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Functional Requirement**

A statement that specifies WHAT a [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) must do. The statement should use formal “shall” language and specify a function in terms that the [stakeholders](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#stakeholders), particularly the system implementers, will understand. In the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada), Functional Requirements have been defined for each [Equipment Package](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#equipment_package) that focus on the high-level requirements that support [regional](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#region) integration.

**Information Flow**

Information that is exchanged between [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) and [terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator) in the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). These information flows are normally identical to the [architecture flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow) in the ITS Architecture for Canada. The terms "information flow" and "architecture flow" are used interchangeably.

**Institutional Layer**

An integral component of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) analysis, the institutional layer represents the existing and emerging institutional constraints and arrangements that are the context for all ITS deployments. The [transportation layer](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#transportation_layer) and [communications layer](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#communications_layer) together provide the technical framework within which interoperable [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) may be implemented. The institutional layer introduces the policies, funding incentives, working arrangements, and jurisdictional structure that support the technical layers of the architecture. This institutional layer provides the basis for understanding who the [stakeholders](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#stakeholders) will be and the roles these implementers could take in implementing architecture-based ITS systems.

**Intelligent Transportation System**

The [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) defined as the electronics, communications or information processing used singly or integrated to improve the efficiency or safety of surface transportation.

**ITS Architecture**

Defines an [architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture) of interrelated [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) that work together to deliver transportation services. An ITS architecture defines how systems functionally operate and the [interconnection](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) of information exchanges that must take place between these systems to accomplish transportation services.

**ITS Architecture for Canada**

A common, established framework for developing integrated transportation [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system). The ITS Architecture for Canada is comprised of the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) and the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture), which satisfy a defined set of [user service requirements](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_service_requirement). The [ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture) for Canada is maintained by [Transport Canada](http://www.tc.gc.ca/eng/menu.htm).

**ITS Project**

Any project that in whole or in part funds the acquisition of technologies or [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) of technologies that provide or significantly contribute to the provision of one or more ITS [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services).

**ITS Security Area**

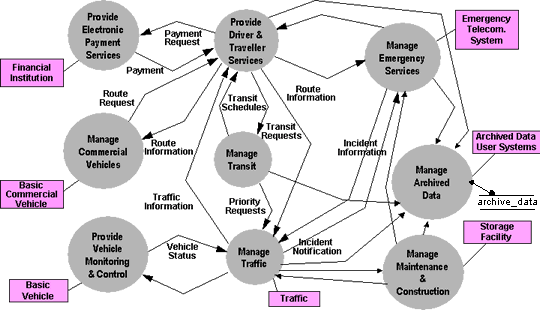
Areas of ITS which can be used to enhance surface transportation security. The [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) provides entities ([subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) and [terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator)), functions, and interfaces that cover aspects of the eight ITS security areas.

**Legacy System**

Existing transportation [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system), communications systems, and institutional processes.

**Logical Architecture**

The logical architecture view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) defines what has to be done to support the ITS [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services). It defines the [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) that perform ITS functions and the information or [data flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow) that are shared between these processes. The logical architecture was developed using Structured Analysis techniques and consists of [data flow diagrams](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow_diagram), [process specifications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process_specification), and data dictionary entries. The logical architecture has also been called an "Essential Model" because it is not technology specific, nor does it dictate a particular implementation. This implementation independence makes the logical architecture accommodating to innovation, scalable from small scale implementations to large regional [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system), and supportive of widely varied system designs.

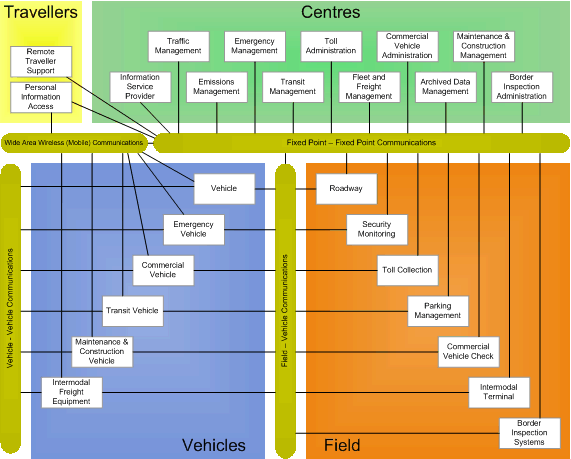


**Logical Architecture Document**

The [Logical Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) document contains three volumes: Description (Volume 1), [Process Specifications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process_specification) (Volume 2), and Data Dictionary (Volume 3). These documents present a functional view of the ITS [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services), contain diagrams that show processes and [data flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow) among them, and define data elements, respectively.

**Physical Architecture**

The physical architecture is the part of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) that provides agencies with a physical representation (though not a detailed design) of the important ITS interfaces and major [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) components. It provides a high-level structure around the [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) and [data flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow) defined in the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture). The principal elements in the physical architecture are the [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) and [architecture flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow) that connect these subsystems and [terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator) into an overall structure. The physical architecture takes the processes identified in the logical architecture and assigns them to subsystems. In addition, the data flows (also from the logical architecture) are grouped together into architecture flows. These architecture flows and their communication requirements define the interfaces required between subsystems, which form the basis for much of the ongoing [standards](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#standards) work in the ITS program.



**Physical Architecture Document**

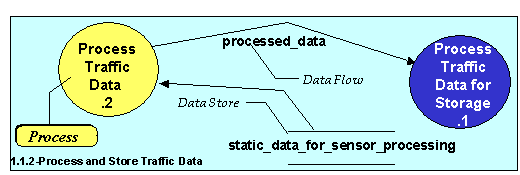
The [Physical Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) document describes the transportation and [communications layers](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#communications_layer) resulting from the partitioning of the [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) within the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture), presents [architecture flow](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow) diagrams that show data passing among physical [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem), and provides characteristics and constraints on the [data flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow).

**Physical Entities**

Entities are the persons, places, and things that make up an [intelligent transportation system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#intelligent_transportation_system). In the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture), an entity represents a [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) [subsystem](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) or [terminator](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator).

**Process**

A function or activity identified in the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) that is required to support the ITS [user service requirements](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_service_requirement). The logical architecture presents processes in a top-down fashion beginning with general processes (e.g., "Manage Traffic") that are then decomposed into more detailed processes (e.g., "Provide Traffic Surveillance", "Monitor HOV Lane Use"). General processes are defined in terms of more detailed processes using [data flow diagrams](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow_diagram). The most detailed processes (sometimes called primitives) are defined in [Process Specifications](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process_specification) (PSpecs).



**Process Specification (PSpec)**

The textual definition of the most detailed [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) identified in the [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). The process specification includes an overview, a set of [functional requirements](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#functional_requirement), and a complete set of inputs and outputs.

**Project ITS Architecture**

A framework that identifies the institutional agreement and technical integration necessary to interface a major ITS project with other ITS projects and [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system).

**Region**

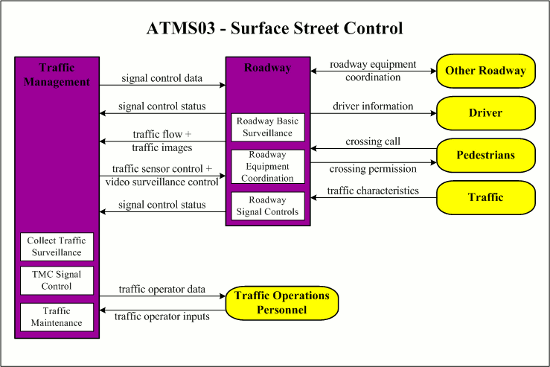
The geographical area that identifies the boundaries of the [Regional ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture) and is defined by and based on the needs of the participating agencies and other [stakeholders](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#stakeholders). In metropolitan areas, a region should be no less than the boundaries of the metropolitan planning area.

**Regional ITS Architecture**

A specific, tailored framework for ensuring institutional agreement and technical integration for the implementation of [ITS projects](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_project) or groups of projects in a particular [region](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#region). It functionally defines what pieces of the [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) are linked to others and what information is exchanged between them.

**Service Package**

The service packages provide an accessible, service-oriented perspective to the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). They are tailored to fit, separately or in combination, real world transportation problems and needs. Service packages collect together one or more [equipment packages](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#equipment_package) that must work together to deliver a given transportation service and the [architecture flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow) that connect them and other important external [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system). In other words, they identify the pieces of the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) that are required to implement a particular transportation service.



**Service Packages Document**

The Service Packages document provides a comprehensive review of each of the service packages describing how service packages can be used to plan and implement integrated transportation [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) customized to local needs. This document includes a number of examples that illustrate ways service packages can be applied in [Regional ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture) and [Project ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#project_its_architecture) development activities. Through these definitions, analyses, and examples, the Service Packages document provides a comprehensive review of the service packages and how they can be used to plan and implement integrated transportation systems customized to local needs.

**Stakeholders**

A widely used term that notates a public agency, private organization or the travelling public with a vested interest, or a "stake" in one or more transportation [elements](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#element) within a [Regional ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture).

**Standards**

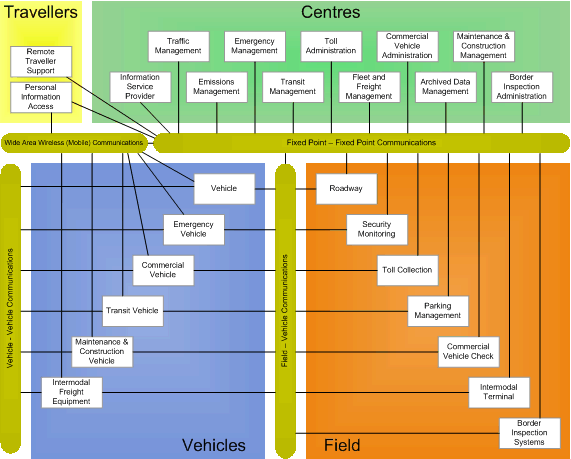
Documented technical specifications sponsored by a Standards Development Organization (SDO) to be used consistently as rules, guidelines, or definitions of characteristics for the interchange of data. A broad array of ITS standards is currently under development that will specifically define the interfaces identified in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Subsystem**

The principle structural element of the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) view of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). Subsystems are individual pieces of the [Intelligent Transportation System](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#intelligent_transportation_system) defined by the ITS Architecture for Canada. Subsystems are grouped into four classes: Centres, Field, Vehicles, and Travellers. Example subsystems are the Traffic Management Subsystem, the Vehicle Subsystem, and the Roadway Subsystem. These correspond to the physical world: respectively traffic operations centers, automobiles, and roadside signal controllers. Due to this close correspondence between the physical world and the subsystems, the subsystem interfaces are prime candidates for standardization.

**Subsystem Diagram**

A diagram which depicts all [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) and the basic communication channels between these subsystems. The subsystem diagram is a top-level [architecture interconnect](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) diagram. Variations of the subsystem diagram are sometimes used to depict [Regional ITS Architectures](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture) at a high level.



**System**

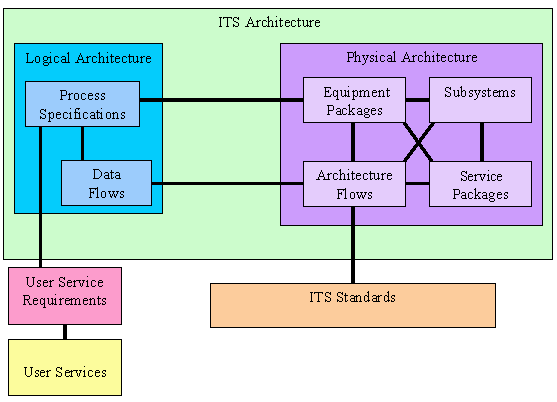
A collection of hardware, software, data, [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process), and people that work together to achieve a common goal. Note the scope of a "system" depends on one's viewpoint. To a sign manufacturer, a dynamic message sign is a "system". To a provincial ministry, the same sign is only a component of a larger Freeway Management "System". In a [Regional ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture), a Freeway Management System is a part of the overall surface transportation "system" for the region.

**Terminator**

Terminators define the boundary of an [architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture). The [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada)terminators represent the people, systems, and general environment that interface to ITS. The interfaces between terminators and the [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) and [processes](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#process) within the ITS Architecture for Canada are defined, but no [functional requirements](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#functional_requirement) are allocated to terminators. The [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture) and [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture) views of the ITS Architecture for Canada both have exactly the same set of terminators. The only difference is that logical architecture processes communicate with terminators using [data flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#data_flow), while physical architecture subsystems use [architecture flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow).

**Traceability**

A cornerstone of the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) is the traceability between its components. Microsoft Access databases are used to maintain these connections. The hyperlinked ITS Architecture for Canada relies on this traceability to build the links that allows traversal between [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services), [logical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#logical_architecture), and [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture).



**Transportation Layer**

One of three layers (along with the [communications layer](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#communications_layer) and the [institutional layer](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#institutional_layer)) defined by the [physical architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#physical_architecture). The transportation layer shows the relationships among the transportation related elements. It is composed of [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) for travellers, vehicles, transportation management centres, and field devices, as well as external system interfaces ([terminators](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#terminator)) at the boundaries.

**Traveller Subsystems**

Equipment used by travellers to access ITS services pre-trip and en-route. This includes services that are owned and operated by the traveller as well as services that are owned by transportation and information providers. One of four general [subsystem](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) classes defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Turbo Architecture**

An automated software tool used to input and manage system inventory, [service packages](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#service_package), [architecture flows](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_flow) and [interconnects](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) with regard to a [Regional ITS Architecture](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#regional_its_architecture) and/or multiple [Project ITS Architectures](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#project_its_architecture).

**User Service Requirement**

A specific [functional requirement](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#functional_requirement) statement of what must be done to support the ITS [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services). The user service requirements were developed specifically to serve as a requirements baseline to drive [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) development. The user service requirements are not to be construed as mandates to system/architecture implementers. As a requirements baseline, the user service requirements include little narrative or background material.

**User Services**

User services document what ITS should do from the user's perspective. A broad range of users are considered, including the travelling public as well as many different types of system operators. User services, including the corresponding [user service requirements](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_service_requirement), form the basis for the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada) development effort. The concept of user services allows [system](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system) or project definition to begin by establishing the high level services that will be provided to address identified problems and needs. New or updated user services have been and will continue to be satisfied by the ITS Architecture for Canada over time.

**User Services Bundle**

A logical grouping of [user services](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#user_services) that provides a convenient way to discuss the range of requirements in a broad stakeholder area. User services are grouped into nine bundles: Traveller Information, Traffic Management, Public Transportation Management, Electronic Payment, Commercial Vehicle Operations, Emergency Management, Advanced Vehicle Safety Systems, Information Management, and Maintenance and Construction Operations.

**Vehicle - Vehicle Communications**

Dedicated wireless system handling high data rate, low probability of error, line of sight communications between vehicles. Advanced vehicle services may use this link in the future to support advanced collision avoidance implementations, road condition information sharing, and active coordination to advanced control [systems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#system). One of the types of [architecture interconnects](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Vehicle Subsystems**

Covers ITS related elements on vehicle platforms. Vehicle [subsystems](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#subsystem) include general driver information and safety systems applicable to all vehicle types. Four fleet vehicle subsystems (Transit, Emergency, Commercial and Maintenance and Construction Vehicles) add ITS capabilities unique to these special vehicle types. One of four general subsystem classes defined in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada).

**Wide Area Wireless (mobile) Communications**

A communications link that provides communications via a wireless device between a user and an infrastructure-based system. Both broadcast (one-way) and interactive (two-way) communications services are grouped into wide-area wireless communications in the [ITS Architecture for Canada](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#its_architecture_for_canada). These links support a range of services in the ITS Architecture for Canada including real-time traveller information and various forms of fleet communications. One of the types of [architecture interconnects](http://www.tc.gc.ca/innovation/its/eng/architecture/static/general/reference/glossary.htm#architecture_interconnect) defined in the ITS Architecture for Canada.