13.13 DEFINITIONS

*Architecture* – See *ITS Architecture* and *National ITS Architecture (NA)* below.

*Configuration Management* - A process developed to control change in complex information technology based systems.

*Center Subsystems* - Subsystems that provide management, administrative and support functions for the transportation system. Also one of four general subsystems defined in the NA.

*Data Dictionary Entry (DDE)* - Contains definitions and description of every data flow included in the logical architecture view of the NA as well as identification of lower level data elements that make up the data flow.

*Data Flows* - They represent data flowing between processes or between processes and a terminator. A data flow is shown as an arrow on a data flow diagram and is defined in a data dictionary entry. Data flows are aggregated together to form high-level architecture flows in the physical architecture view of the NA. See Data Flow diagram.

*Data Flow Diagram* - The diagrams in the logical architecture view of the NA that show the functions that are required for ITS and the data that moves between these functions.

*Dedicated Short Range Communications (DSRC)* - A wireless communications channel used for close-proximity communications between vehicles and the immediate infrastructure. It supports location-specific communications for ITS services such as toll collection, transit vehicle management, driver information, and automated commercial vehicle operations. Also one of four types of interconnects defined in the NA.

*Equipment Package* - A group of ITS elements that are combined to perform one or more specific functions. A Market Package is generally made up of one or more Equipment Packages.

*Exempt ITS Project* – See Section 13.2.1 above for a full definition and examples.

*Functional Requirements* - What a system must do to address the needs or provide the services that have been identified for the ITS Project. In a regional ITS architecture, the functional requirements focus on the high-level requirements for providing desired service to the user.

*High-Risk ITS Project* – (Previously called “Major ITS Project.”) An ITS project that has one or more of the seven risk factors identified in Section 13.2 (above) is generally considered a high-risk ITS project. (See also “Low-Risk ITS Project.”)

*Institutional Integration* - Represents the process of combining existing and emerging institutional constraints and arrangements.

*Interchangeability* - The capability to exchange devices of the same type from any vendor without changing the software.

*Interconnect* - See architecture interconnect. Also applies to traffic signal interconnect.

*Interoperability* - The capability to operate devices from different manufacturers or different device types (e.g., signal controllers and dynamic message signs on the same communication channel).
**Intelligent Transportation Systems (ITS)** - Federal regulations (23 CFR 940) defined ITS as “...electronics, communications, or information technology, used singly or in combination, to improve the efficiency or safety of the surface transportation system.” This is a broad definition, covering the range from small, simple devices up to large and complex systems. In addition to this legal definition, most people say that ITS must include comprehensive management strategies and apply technologies in an integrated manner. The purpose of ITS integration is to share information and reduce redundant spending between jurisdictions. ITS Integration includes both technical and inter-agency aspects of system development. (See section 13.1.5 above for further information.)

**ITS Architecture** - Defines how systems functionally operate and the interconnection of information exchanges that must take place between these systems to accomplish transportation services.

**ITS Strategic Plan** - A guide for long-term implementation of ITS in the state, metropolitan area or region. It normally includes identifying regional transportation needs and then defining ITS elements to be implemented over time, aimed at meeting those needs. RA is typically a core component of an ITS strategic plan.

**Legacy System** - Existing transportation systems, communication systems or institutional systems.

**Life cycle** - Denotes the strategic cycle or sequencing of a specific process.

**Logical Architecture** - This relates primarily to the software part of the system. It defines the thought or logic processes that perform ITS functions and the information or data flows that are shared between these processes.

**Low-Risk ITS Project** – (Previously called “Minor ITS Project.”) An ITS project that has none of the seven risk factors identified in Section 13.2 (above) is generally considered a low-risk ITS project. (See also “High-Risk ITS Project.”)

**Maintenance Plan** - A description of configuration control and update guidelines for regional and/or project ITS architectures. The primary purpose of the maintenance plan is to maintain an architecture baseline.

**Market Package** – A group of ITS elements that can be combined to perform a User Service. A Market Package is generally made up of one or more Equipment Packages.

**Major ITS Project** – See “High-Risk ITS Project.” This terminology is obsolete.

**Minor ITS Project** – See “Low-Risk ITS Project.” This terminology is obsolete.

**National ITS Architecture (NA)** - A common established national framework for ITS interconnectivity and interoperability. It comprises the logical architecture and physical architecture that satisfy a defined set of user services. Maintained by the U.S. Department of Transportation (USDOT), under contract at: http://itsarch.iteris.com/itsarch.

**Physical Architecture** - This is primarily the hardware part of the system. The part of the NA that provides a physical representation of the important ITS interfaces and major system components. The principal elements of the physical architecture are the subsystems, terminators and the communication interface between them.
**Process Specification (PSpec)** - The textual definition of the most detailed process identified in the logical architecture view of the NA. The PSpec includes an overview, a set of functional requirements, a complete set of inputs and outputs, and a list of user service requirements that are satisfied by the PSpec.

**Project ITS Architecture (PIA)** - A framework that identifies the institutional agreement and technical integration necessary to define an ITS project and its interface with other ITS projects and systems.

**Protocol Communications** - A set of rules for how messages are coded and transmitted between electronic devices. The equipment at each end of a data transmission must use the same protocol to successfully communicate. It is like human language that has an alphabet, vocabulary, and grammar rules used by everyone who speaks that language.

**Regional ITS Architecture (RA)** - A regional or state level framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects. It defines what pieces of the system are linked to others and what information is exchanged between them.

**Requirements Definitions** - A total set of considerations that govern what is to be accomplished, how well and under what conditions.

**Roadside Subsystems** - One of four general classes of subsystems defined in the NA. This class is distributed along the transportation network, which performs surveillance, information provision, and control functions. Located on roadway facilities, parking facilities, toll systems, and commercial vehicle check systems that are at or near the roadside.

**Sausage Diagram** - A top-level diagram, which depicts all subsystems in the NA and the basic communication, interconnects between the subsystems. It can be used as a template for the physical architecture portion of a RA.


**Service Boundaries** - The geographic boundary of a specific service or agency that provides a service. An example is the service area of a transit agency. The transit agency provides services within a defined boundary.

**Standards** - Established and documented technical specifications sponsored by a Standards Development Organization (SDO) to be used consistently by industries or government for interoperability, compatibility, interconnect ability, interchangeability and expandability. Already developed ITS standards can be found in the NA web site by selecting an Architecture Flow.

**Subsystem** - The principal structural elements of the physical architecture view of the NA. Subsystems are grouped in four classes: centers, roadside, vehicles and travelers.

**System Inventory** - The collection of all ITS related elements in a RA.

**Systems Engineering Analysis** - Is a structured process for arriving at a final design of a system. The final design is selected from a number of alternatives that would accomplish the same objectives and considers the total life-cycle of the project including not only the technical merits of potential solutions but also the costs and relative value of alternatives.
Systems Engineering Review Form (SERF) – The SERF is a form containing seven questions about an ITS project, which must be completed for all Low-Risk and High-Risk ITS projects. See Figure 13.5 for a diagram showing the role of the SERF, and see Section 13.4.1 for a narrative description.

Systems Engineering Management Plan (SEMP) - The SEMP is a set of documents that describe how the systems-engineering elements of a High-Risk ITS project will be managed. See Figure 13.5 for a diagram showing the role of the SEMP, and see Section 13.4.1 for a narrative description. For a full description of the SEMP plus examples, see the FHWA/Caltrans “Systems Engineering Guidebook for ITS” at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm

Systems Engineering “Vee” Process – See Figure 13.3 and related narrative, above. For a full description of this process, see the FHWA/Caltrans “Systems Engineering Guidebook for ITS” at: http://www.fhwa.dot.gov/cadiv/segb/views/process/index.htm

Traveler Subsystems - Equipment used by travelers to access ITS services pre-trip and en route. This includes services owned and operated by the traveler as well as services that are owned by transportation and information providers. One of four general subsystem classes defined in the NA.

Turbo Architecture - An automated software tool used to input and manage system inventory, market packages, interconnects and architecture flows with regards to RA. The Turbo Architecture is an excellent software tool for developing RA, PIA, development and design of an ITS project. However, the Turbo Architecture must be purchased since it is not a public domain.

User Services - A service that ITS provides the user from the user’s perspective. A broad range of users are considered, include the traveling public as well as many different types of system operators. User Services form the basis for the National ITS Architecture development effort. Currently, 33 user services are defined in the NA.

User Service Requirements - Specific statements specifying what must be done to support the ITS user services. The user services requirements were developed specifically to serve as a baseline to drive NA development. The user service requirements are not requirements to system/architecture implementers, but rather are directions to the NA development team.

V Diagram (or Vee Diagram) – See Systems Engineering Vee Process above.

Vehicle Subsystems - They are subsystems located in vehicles, which include driver information and safety systems. One of four general subsystem classes defined in the NA.

Vehicle-to-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. One of four types of architecture interconnects defined in the NA.

Wireline Communications - A communications link serving fixed locations. It uses a variety of public or private communications networks that may physically include wireless (e.g. microwave) as well as wireline infrastructure. One of four types of architecture interconnects defined in the NA.