

TRANSPORTATION RESEARCH

CIRCULAR

Number xxx

January 2006

Glossary of Regional Transportation Operations Terms

**TRANSPORTATION
RESEARCH
CIRCULAR**

Glossary of Regional Transportation Operations Terms

Prepared for the Federal Highway Administration
and coordinated with the
National Transportation Operations Coalition
and
TRB Committee AHB10 – Regional Transportation Systems Management and Operations
by
Science Applications International Corporation (SAIC)
John Mason, Task Manager
Jocelyn Bauer, Research Associate

Transportation Research Board
National Research Council
2101 Constitution Avenue, NW
Washington, DC 20418

The **Transportation Research Board** is a division of the National Research Council, which serves as an independent adviser to the federal government on scientific and technical questions of national importance. The National Research Council, jointly administered by the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine, brings the resources of the entire scientific and technical community to bear on national problems through its volunteer advisory committees.

The **Transportation Research Board** is distributing this Circular to make the information contained herein available for use by individual practitioners in state and local agencies, researchers in academic institutions, and other members of the transportation research community. The information in this Circular was taken directly from the submission of the authors. This document is not a report of the National Research Council or of the National Academy of Sciences.

Contents

Introduction	4
Glossary.....	6

Introduction

With the increasing interest in transportation operations and the incorporation of transportation system management and operations into Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy For Users (SAFETEA-LU), it becomes imperative that the transportation community use a common vocabulary. The purpose of this glossary is to provide clear and agreed-upon definitions to terms as they are typically used in the context of regional transportation operations.

The definitions used in this glossary are, to the extent possible, based on existing definitions defined in law or regulation. Where it has been necessary to develop additional definitions, care has been taken to achieve consensus within the transportation operations community, typically by inviting comment from the National Transportation Operations Coalition (NTOC), which includes participation by a wide range of transportation-related constituencies. This glossary is a first attempt at providing a comprehensive document of this nature. It is anticipated that subsequent versions will provide for refinement and expansion.

There are several transportation-related fields that participate in regional transportation operations. This glossary defines a common vocabulary that may be used by practitioners in these fields to facilitate communication with each other and between disciplines about their regional transportation operations activities.



The picture on the previous page illustrates how regional transportation operations vocabulary contributes to the overall vocabulary of each transportation-related field connected to regional transportation operations. The common regional transportation operations vocabulary is depicted by the spiraling interstellar gas and dust. Several different transportation-related fields are scattered throughout like stars in a galaxy.

The transportation-related fields differ in the portion of their total vocabulary that is focused on regional transportation operations. Some fields may be entirely focused on regional transportation operations and have no other terms. Although the transportation-related fields were randomly positioned in the illustration above, fields that are focused on regional transportation operations could be thought of as closer to the center of the galaxy. Other fields may be on the edge of the galaxy and only have a few terms within the domain of regional transportation operations as operations is only peripheral to their daily work.

It is recognized that several of these field (e.g., traffic management centers, emergency management) may have slightly differing definitions of common terms. It is not the intent of this glossary to argue for changing definitions in any particular field. This glossary is aimed at providing a common vocabulary for working across the wide range of transportation operations activities.

Comments and suggestions are welcomed and should be forwarded to John Mason at John.Mason@saic.com or Jocelyn Bauer at Jocelyn.K.Bauer@saic.com.

Glossary

Regional Transportation Operations

3-C Process. Continuing, cooperative and comprehensive planning process.

A continuing, cooperative, and comprehensive (“3 C”) process to encourage and promote the development of a multimodal transportation system that ensures safe and efficient movement of people and goods while balancing environmental and community needs. Statewide and metropolitan transportation planning processes are governed by Federal law and applicable State and local laws.

[FHWA, Transportation Planning Capacity Building Acronym List.
[http://www.planning.dot.gov/glossary.asp#acronyms.](http://www.planning.dot.gov/glossary.asp#acronyms)]

Capacity. A transportation facility’s ability to accommodate a moving stream of people or vehicles in a given time period.

[FHWA, Transportation Planning Capacity Building Glossary.
[http://www.planning.dot.gov/glossary.asp.](http://www.planning.dot.gov/glossary.asp)]

Collaboration. Any cooperative effort between and among governmental entities (as well as with private partners) through which the partners work together to achieve common goals.

Collaboration is any cooperative effort between and among governmental entities (as well as with private partners) through which the partners work together to achieve common goals. Such collaboration can range from very informal, ad hoc activities to more planned, organized and formalized ways of working together. The collaborative parties work toward mutual advantage and common goals. They share a sense of public purpose, leverage resources to yield improved outcomes, and bridge traditional geographic, institutional, and functional boundaries. Collaboration leads to improved understanding of the ways various levels of government interact and carry out their roles and responsibilities. The resulting effect frequently streamlines operations and enhances quality of life for residents of the localities involved.

[PTI, *Crossing Boundaries – On the Road to Public-Private Partnerships*. Note: Inserted phrase “through which the partners work together to achieve common goals” for clarity.]

Congestion Management Process. A systematic and formalized approach to addressing congestion through effective management and operation.

Within a metropolitan planning area serving a transportation management area, the transportation planning process under this section shall address congestion management through a process that provides for effective management and operation, based on a cooperatively developed and implemented metropolitan-wide strategy, of new and existing transportation facilities eligible for funding under this title and chapter 53 of title 49 through the use of travel demand reduction and operational management strategies.

[23 U.S.C. 134(k)(3) and 49 U.S.C. 5303(k)(3).]

Congestion Management System (CMS). A congestion management system (CMS) presents a systematic process for managing traffic congestion and provides information on transportation system performance.

A congestion management system (CMS) presents a systematic process for managing traffic congestion and provides information on transportation system performance. A CMS should include alternative strategies for alleviating congestion and enhancing the mobility of persons and goods to levels that meet State and local needs.

[Federal Register, Part III, FHWA, FTA, U.S. Department of Transportation, Management and Monitoring Systems. Section 500.109.]

A CMS can take a variety of forms. At the core, a CMS should include system for data collection and performance monitoring, a range of strategies for addressing congestion, performance measures or criteria for identifying when action is needed, and a system for prioritizing which congestion management strategies would be most effective.

[FHWA, *Getting More by Working Together - Opportunities for Planning and Operations: A Reference Manual* (2005).]

Through SAFETEA-LU, the congestion management system has been replaced by the congestion management process. According to SAFETEA-LU, under certain conditions the congestion management system may constitute the congestion management process.

[23 U.S.C. Section 135 (i).]

Institutional Integration. Coordination between various agencies and jurisdictions to achieve seamless operations and/or interoperability.

Institutional integration involves coordination between various agencies and jurisdictions to achieve seamless operations and/or interoperability. In order to achieve effective institutional integration of systems, agencies and jurisdictions must agree on the benefits of ITS and the value of being part of an integrated system. They must agree on roles, responsibilities, and shared operational strategies. Finally, they must agree on standards and, in some cases, technologies and operating procedures to ensure interoperability.

[Federal Register, Department of Transportation, FHWA, 23 CFR Parts 655 and 940, Supplementary Information.]

Integrated Corridor Management (ICM). ICM involves the coordination of transportation management techniques between networks in a corridor that together can collectively address congestion and improve overall corridor performance.

ICM involves the coordination of transportation management techniques between networks in a corridor that together can collectively address congestion and improve overall corridor performance. Transportation corridors are usually characterized by a system of heavily traveled parallel transportation networks that link major activity centers.

[FHWA Current Program Activities Report, December 2004.
http://ops.fhwa.dot.gov/program_areas/progmactiv.htm.]

Integrated Transportation Management System (ITMS). An ITMS provides for the automated, real-time sharing of information between ITS-based systems and the coordination of management activities between agencies.

An Integrated Transportation Management System (ITMS) provides for the automated, real-time sharing of information between ITS-based systems and the coordination of management activities between agencies, thereby enhancing system interoperability and enabling an area-wide view of the transportation network.

[Transportation Research Board Freeway Operations Committee as cited in the *4th Integrated Transportation Management Systems (ITMS) Conference: Conference Proceedings*, August 2001. http://www.itsdocs.fhwa.dot.gov/JPODOCS/REPTS_TE/13661.pdf.]

Intelligent Transportation System (ITS). Electronics, communications, and information processing that are integrated to improve the efficiency or safety of surface transportation.

[National ITS Architecture Team, U.S. Department of Transportation, *Regional ITS Architecture Guidance – Developing, Using, and Maintaining an ITS Architecture for Your Region*, Oct. 12, 2001.]

ITS Architecture. Defines a framework within which interrelated systems can be built that work together to deliver transportation services.

An ITS architecture defines a framework within which interrelated systems can be built that work together to deliver transportation services. It defines how systems functionally operate and the interconnection of information exchanges that must take place between these systems to accomplish transportation services.

[U.S. Department of Transportation, *Regional ITS Architecture Guidance – Developing, Using, and Maintaining an ITS Architecture for Your Region*, National ITS Architecture Team, Oct. 12, 2001. Combines definitions of “architecture” and “ITS architecture.”]

Long Range Transportation Plan (LRTP).¹ A document resulting from regional or statewide collaboration and consensus on a region or state’s transportation system, and serving as the defining vision for the region’s or state’s transportation systems and services.

A document resulting from regional or statewide collaboration and consensus on a region or state’s transportation system, and serving as the defining vision for the region’s or state’s transportation systems and services. In metropolitan areas, the plan indicates all of the transportation improvements scheduled for funding over the next 20 years. It is fiscally constrained, i.e., a given program or project can reasonably expect to receive funding within the time allotted for its implementation.

[FHWA Transportation Planning Capacity Building Glossary. <http://www.planning.dot.gov/glossary.asp>.]

Maintenance. In general, the preservation (scheduled and corrective) of infrastructure.

The preservation of the entire highway/transit line, including surface, shoulders, roadsides, structures, and such traffic-control devices as are necessary for safe and efficient utilization of the highway/transit line.

[23 U.S.C. 101(a). Added transit line to the definition.]

¹ Sometimes referred to as Long Range Plan (LRP), Constrained Long Range Plan (CLRP), or Regional Transportation Plan.

Management and Operations (M&O). See Transportation Systems Management and Operations.

Metropolitan Transportation Plan (MTP). The official intermodal transportation plan that is developed and adopted through the metropolitan transportation planning process for the metropolitan planning area, in accordance with 23 U.S.C. 134, 23 U.S.C. 135 and 49 U.S.C. 5303.

[FHWA Transportation Planning Capacity Building Glossary.
<http://www.planning.dot.gov/glossary.asp>.]

National ITS Architecture (also “national architecture”). A common framework for ITS interoperability.

The term “national architecture” means the common framework for interoperability that defines--(A) the functions associated with intelligent transportation system user services; (B) the physical entities or subsystems within which the functions reside; (C) the data interfaces and information flows between physical subsystems; and (D) the communications requirements associated with the information flows.

[SAFETEA-LU Section 5310.]

The National ITS Architecture is maintained by the United States Department of Transportation (DOT) and is available on the DOT web site at <http://www.its.dot.gov>.

Operational Concept [in ITS Architecture]. An operational concept identifies the roles and responsibilities of participating agencies and stakeholders.

An operational concept identifies the roles and responsibilities of participating agencies and stakeholders. An operational concept defines the institutional and technical vision for the region and describes how the system will work at very high-level, frequently using operational scenarios as a basis.

[U.S. Department of Transportation, *Regional ITS Architecture Guidance – Developing, Using, and Maintaining an ITS Architecture for Your Region*, National ITS Architecture Team, Oct. 12, 2001.]

Operations. See Transportation Systems Management and Operations.

Operations and Maintenance (O&M). The range of activities and services provided by a transportation agency and the upkeep and preservation of the existing system.

Operations and maintenance is the range of activities and services provided by a transportation agency and the upkeep and preservation of the existing system. Specifically, operations includes the range of activities/services provided by transportation system agencies or operators (routine traffic and transit operations, response to incidents/accidents, special events management, work zone traffic management, etc; see “Operations”). Maintenance relates to the upkeep and preservation of the existing system (road, rail and signal repair, right-of-way upkeep, etc; see “Maintenance”).

Performance Measurement. Performance measurement is a process of assessing progress toward achieving predetermined goals.

Performance measurement is a process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services, the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of a program activity compared to its intended purpose), and the effectiveness of government operations in terms of their specific contribution to program objectives.

[Transportation Research Board, *Performance Measures of Operational Effectiveness for Highway Segments and Systems – A Synthesis of Highway Practice*, NCHRP Synthesis 311; Washington, DC; 2003.]

Performance Measures. Indicators of transportation system outcomes with regard to such things as average speed, reliability of travel, and accident rates.

Performance measures are indicators of transportation system outcomes with regard to such things as average speed, reliability of travel, and accident rates. Used as feedback in the decisionmaking process.

[FHWA Transportation Planning Capacity Building Glossary.

<http://www.planning.dot.gov/glossary.asp>. Substituted the word “outcomes” for “performing.”]

Planning Factors. A set of broad objectives defined in Federal legislation to be considered in both the metropolitan and statewide planning process.

Planning factors are a set of broad objectives defined in Federal legislation to be considered in both the metropolitan and statewide planning process. Both SAFETEA-LU and its predecessors, TEA-21 and ISTEA, identify specific factors that must be considered in the planning process. TEA-21 consolidated what were previously 16 metropolitan and 23 statewide planning “factors” into seven broad “areas” to be considered in the planning process, both at the metropolitan and statewide level. SAFETEA-LU increased the number of planning factors to eight by creating separate planning factors for safety and security. SAFETEA-LU added language to emphasize the correspondence between transportation improvements and economic development and growth plans.

Below are the planning factors for the metropolitan planning process. SAFETEA-LU specifies identical factors for the statewide planning process with the exception that the emphasis is on the state instead of the metropolitan area.

SAFETEA-LU states that in general the metropolitan planning process for a metropolitan planning area under this section shall provide for consideration of projects and strategies that will—

- A. Support the economic vitality of the metropolitan area, especially by enabling global competitiveness, productivity, and efficiency;
- B. Increase the safety of the transportation system for motorized and nonmotorized users;
- C. Increase the security of the transportation system for motorized and nonmotorized users;
- D. Increase the accessibility and mobility of people and for freight;
- E. Protect and enhance the environment, promote energy conservation, improve the quality of life, and promote consistency between transportation improvements and State and local planned growth and economic development patterns;
- F. Enhance the integration and connectivity of the transportation system, across and between modes, for people and freight;
- G. Promote efficient system management and operation; and
- H. Emphasize the preservation of the existing transportation system.

[SAFETEA-LU Section 6001(a) and 23 U.S.C. 134 (h) (1).]

Planning for Operations.

A term that may be used in two contexts – the operating environment and the planning environment. In the operating environment, “planning for operations” is the short and long range planning that considers how agency or multi-agency operations (incident management, special events, snow plowing, etc.) will be executed. In the transportation planning community (primarily State DOTs and MPOs), “planning for operations” speaks to including transportation system management and operations (TSM&O) in the range of options being considered to address transportation challenges.

¹**Region.** A metropolitan or other multi-jurisdictional area.

²Region. The geographical area that identifies the boundaries of the regional ITS architecture and is defined by and based on the needs of the participating agencies and other stakeholders.

A region is the geographical area that identifies the boundaries of the regional ITS architecture and is defined by and based on the needs of the participating agencies and other stakeholders. In metropolitan areas, a region should be no less than the boundaries of the metropolitan planning area.

[23 CFR Part 940.3.]

Regional ITS Architecture. A regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects.

A regional ITS architecture is a regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects.

[23 CFR Part 940.3.]

The regional ITS architecture shall include, at a minimum, the following: (1) A description of the region; (2) Identification of participating agencies and other stakeholders; (3) An operational concept that identifies the roles and responsibilities of participating agencies and stakeholders in the operation and implementation of the systems included in the regional ITS architecture; (4) Any agreements (existing or new) required for operations, including at a minimum those affecting ITS project interoperability, utilization of ITS related standards, and the operation of the projects identified in the regional ITS architecture; (5) System functional requirements; (6) Interface requirements and information exchanges with planned and existing systems and subsystems (for example, subsystems and architecture flows as defined in the National ITS Architecture); (7) Identification of ITS standards supporting regional and national interoperability; and (8) The sequence of projects required for implementation.

[23 CFR Part 940.9.]

Development of the regional ITS architecture should be consistent with the transportation planning process for Statewide and Metropolitan Transportation Planning.

[23 CFP Part 940.5.]

Regional Concept for Transportation Operations. A tool to guide regional operations collaboration with a shared regional objective for transportation operations and a description of what is needed to achieve that objective over a three- to five-year horizon.

A regional concept for transportation operations is a tool to guide regional operations collaboration with a shared regional objective for transportation operations and a description of what is needed to achieve that objective over a three- to five-year horizon.

[FHWA, *Starting with the End in Mind: Regional Concept for Transportation Operations*, Presentation at the TRB 84th Annual Meeting, Washington, DC, January 2005.]

It is a description of the desired state for transportation operations presented as an operations objective accompanied by a set of physical improvements that need to be implemented, relationships and procedures that must be established, and resource arrangements that are needed to accomplish the operations objective. Both the operations objective and what is needed to achieve it are accomplished through deliberate and sustained collaboration among stakeholders. An RCTO is created out of ongoing collaboration primarily between managers responsible for operating the transportation system on a day-to-day basis, such as for traffic operations, transit service, and public safety. Development of an RCTO should include participation by the regional planning organization to ensure consistency with the region's vision and goals.

[Berman, W., Smith, M., & Bauer, J., "A Regional Concept for Transportation Operation: A Tool for Strengthening and Guiding Regional Transportation Operations Collaboration and Coordination," TRB 84th Annual Meeting, Washington, DC, January 2005].

Regional Transportation Operations Collaboration and Coordination. Working together in a sustained manner to address regional transportation operations.

Regional transportation operations collaboration and coordination is working together in a sustained manner to address regional transportation operations. Regional operations collaboration and coordination is a deliberate, continuous, and sustained activity that takes place when transportation agency managers and officials responsible for day-to-day operations work together at a regional level to solve operational problems, improve system performance, and communicate better with one another.

[FHWA, *Regional Transportation Operations Collaboration and Coordination: A Primer for Working Together to Improve Transportation Safety, Reliability, and Security*, 2003.]

State Transportation Improvement Program (STIP). A staged, multi-year, statewide, intermodal program of transportation projects.

A staged, multi-year, statewide, intermodal program of transportation projects, consistent with the statewide transportation plan and planning processes as well as metropolitan plans, TIPs, and processes.

[FHWA Transportation Planning Capacity Building Glossary.
<http://www.planning.dot.gov/glossary.asp>.]

Transportation Demand Management (TDM). Programs designed to reduce demand for transportation through various means, such as the use of transit and of alternative work hours.

[FHWA Transportation Planning Capacity Building Glossary.
<http://www.planning.dot.gov/glossary.asp>.]

Transportation Improvement Program (TIP). A document prepared by a metropolitan planning organization that lists projects to be funded with FHWA/FTA funds for the next one- to three-year period.

[FHWA Transportation Planning Capacity Building Glossary.
<http://www.planning.dot.gov/glossary.asp>. The glossary definition constrains definition to FHWA/FTA funding; however, many MPOs include additional projects, e.g., non-FHWA/FTA funded projects of regional significance.]

Transportation Management Area (TMA). All urbanized areas over 200,000 in population, and any other area that requests such designation.

[FHWA Transportation Planning Capacity Building Glossary.
<http://www.planning.dot.gov/glossary.asp>.]

Transportation Planning. A continuing, comprehensive, and cooperative process to encourage and promote the development of a multimodal transportation system to ensure safe and efficient movement of people and goods while balancing environmental and community needs.

Statewide and metropolitan transportation planning processes are governed by Federal law and applicable state and local laws.

[Based on language found in 23 U.S.C. Sections 134 and 135.]

Transportation Systems Management and Operations (TSM&O). An integrated program to optimize the performance of existing infrastructure through the implementation of systems, services, and projects designed to preserve capacity and improve security, safety, and reliability.

The term includes improvements to the transportation system such as traffic detection and surveillance, arterial management, freeway management, demand management, work zone management, emergency management, electronic toll collection, automated enforcement, traffic incident management, roadway weather management, traveler information services, commercial vehicle operations, traffic control, freight management, and coordination of highway, rail, transit, bicycle, and pedestrian operations. [This definition is derived from the draft SAFETEA-LU language, but recognizes that some level of TSM&O can occur within a single jurisdiction or agency as well as across multiple agencies and jurisdictions. This definition was not included in SAFETEA-LU, however, may be added through a technical amendment.]

Unified Planning Work Program (UPWP). The management plan for the (metropolitan) planning program. Its purpose is to coordinate the planning activities of all participants in the planning process.

[FHWA Transportation Planning Capacity Building Glossary.
<http://www.planning.dot.gov/glossary.asp>.]

¹Vision. An object of imagination.

[Webster’s New Collegiate Dictionary, 1973.]

²Vision. An agreed statement of the overall aims of a transportation plan.

A vision is an agreed statement of the overall aims of a transportation plan. In the context of regional transportation, a vision is the regionally-agreed statement of the overall aims of the regional transportation plan; describes the target end-state. Typically, a regional transportation vision will drive its goals (policy statements – the ends toward which effort is directed), objectives (measurable results), and strategies (ways/means to achieve objectives). Note also that the definition of Long Range Transportation Plan reflects that the LRTP serves “as the defining vision . . .”