



Visualize 2050 Planning and Programming Process

Regional ITS Architecture

Part 14 of 27



National Capital Region
Transportation Planning Board

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TABLE OF CONTENTS



OVERVIEW OF REGIONAL ITS ARCHITECTURE.....	3
Integration with Planning	3
TPB’S ROLE AND KEY STAFF	4
Role of TPB Subcommittees.....	4
Systems Performance, Operations, and Technology Subcommittee	5
Commuter Connections Subcommittee	5
ROLE OF KEY STAKEHOLDERS.....	5
State and Local Transportation Agencies.....	6
Federal Highway Administration	6
Private Sector	6
PUBLIC ENGAGEMENT	7
Systems Performance, Operations, and Technology Subcommittee.....	7
Commuter Connections Subcommittee.....	7

OVERVIEW OF REGIONAL ITS ARCHITECTURE

The National Capital Region Transportation Planning Board (TPB) develops and maintains the Regional ITS Architecture for the National Capital Region, in compliance with federal laws and U.S. DOT regulations. This architecture, in turn, advises technology aspects of projects and programs included in Visualize 2050. This ITS Architecture Process Document explains this relationship.

A regional Intelligent Transportation System (ITS) architecture is defined as "a regional framework for ensuring institutional agreement and technical integration for the implementation of ITS projects or groups of projects".¹ Its primary purpose is to illustrate and document regional integration so that planning and deployment can take place in an organized and coordinated fashion.

The TPB has developed a comprehensive Metropolitan Washington Regional Intelligent Transportation Systems Architecture (MWRITSA)², the Regional ITS Architecture for the National Capital Region, that plays a crucial role in enhancing the efficiency and effectiveness of the region's transportation systems. The MWRITSA is developed in compliance with federal laws and U.S. Department of Transportation regulations, ensuring that it meets national standards and best practices. The MWRITSA is closely related to the Systems Performance, Operations, and Technology (SPOT) Program and the Commuter Connections Program within the TPB, supporting the goals of improving system performance, reliability, and commuter information.

Integration with Planning

According to the Federal Highway Administration³, the regional ITS architecture serves as a tool for:

- Supporting transportation planning, both long-term and project programming
- Enhancing regional planning by bringing together diverse agencies and stakeholders
- Identifying opportunities for interagency cooperation and cost-effective ITS investments

The MWRITSA aims to be integrated with the TPB's planning activities to enhance the efficiency and effectiveness of the region's transportation network. This integration is achieved through several key mechanisms:

- **Strategic Framework:** The MWRITSA provides a strategic framework that guides the development and implementation of transportation technologies across the region. This framework ensures that all ITS projects align with the TPB's long-term transportation goals and objectives.
- **Data-Driven Decision Making:** By reflecting the use of real-time data and advanced analytics in transportation agency operations and decision-making, the MWRITSA reflects the TPB's performance-based planning approach, enabling planners to identify and prioritize projects that will have the greatest impact on improving system performance and reliability.
- **Enhanced Coordination:** The MWRITSA facilitates coordination among various transportation agencies and stakeholders within the TPB. This ensures that all parties are working collaboratively towards common goals, sharing information, and leveraging resources effectively.
- **Support for Management and Operations:** The MWRITSA is closely linked with the TPB's SPOT Subcommittee. This subcommittee provides guidance on the integration of ITS into daily operations, ensuring that the transportation system is managed efficiently and can respond effectively to both routine and unexpected events.

¹ Code of Federal Regulations (September 22, 2025). 23 CFR Part 940. <https://www.ecfr.gov/current/title-23/chapter-I/subchapter-K/part-940/section-940.3>

² MWRITSA (October 10, 2019). *MWRITSA 2019 Version 1.0*. <https://www1.mwcog.org/itsarch/>

³ Federal Highway Administration (n.d.). *Regional ITS Architecture Guidance Document*. <https://ops.fhwa.dot.gov/publications/regitsarchguide/1intro.htm>

- **State and Agency Architectures:** The MWRITSA is closely linked to ITS architectures developed and maintained by State Departments of Transportation and other member agencies. Details contained in these other architectures are included in the MWRITSA by reference.
- **Future-Proofing:** The MWRITSA is adaptable, allowing it to evolve with technological advancements and changing regional priorities. This ensures that the TPB's planning activities remain relevant and effective in addressing current and future transportation challenges.

By integrating the regional ITS architecture with its planning activities, the TPB can create a more coordinated, efficient, and resilient transportation system that meets the needs of all users.

TPB’S ROLE AND KEY STAFF

The TPB is responsible for developing and maintaining the regional ITS architecture for the National Capital Region. This architecture is updated as needed to reflect changes in regional needs or ITS deployments. The TPB adopts a collaborative process involving multiple stakeholders to develop the MWRITSA. The development process ensures that the architecture:

- Is consistent with the National ITS Architecture.
- Utilizes applicable ITS standards.
- Is developed through a process that includes participation from various stakeholders.

The TPB encourages its members to apply the TPB’s priority strategy-to apply effective technologies that advance the TPB’s goals. The TPB and the region’s transportation operators, who are responsible for planning, operating and maintaining the region’s transportation infrastructure and services, pursue efficient and effective solutions to the region’s transportation challenges through committee work and initiatives such as the Metropolitan Area Transportation Operations Coordination (MATOC) program. The TPB maintains the MWRITSA that provides a regional ITS framework for the foreseeable future and serves as a valuable resource for developing ITS technology.

TABLE 14.1: KEY STAFF

TPB Staff	Title	Role
Kanti Srikanth	Executive Director	Staff Director for the Transportation Planning Board (TPB)
Andrew Meese	Systems Performance Planning Director	Program Lead
Jan-Mou Li	Transportation Engineer	Contributor

Role of TPB Subcommittees

The TPB’s SPOT Subcommittee and the Commuter Connections Subcommittee play a pivotal role in the successful implementation and management of the MWRITSA. These subcommittees provide specialized expertise and guidance, ensuring that the subcommittee member’s programs align with regional transportation goals and address the specific needs of the community. The

SPOT Subcommittee focuses on integrating advanced technologies and data-driven strategies to enhance traffic management and system reliability. Meanwhile, the Commuter Connections Subcommittee works on promoting alternative commuting options and improving real-time information dissemination to reduce congestion and improve air quality. By fostering collaboration among various stakeholders, the TPB subcommittees ensure that both programs are effectively coordinated and contribute to a more efficient and sustainable transportation network.

Systems Performance, Operations, and Technology Subcommittee

The Systems Performance, Operations, and Technology (SPOT) Subcommittee explores management and operational strategies that can improve congestion, safety, maintenance, and system efficiency. It is integral to the development and implementation of the MWRITSA. This subcommittee focuses on improving the performance and operations of the transportation system through the application of advanced technologies and data-driven strategies. The SPOT Subcommittee advises on the development of the regional ITS architecture, ensuring that it aligns with the region's strategic goals for transportation management and operations. By leveraging the MWRITSA, the SPOT Subcommittee can enhance traffic management, incident response, and overall system reliability, contributing to a more efficient and resilient transportation network.

Commuter Connections Subcommittee

The Commuter Connections Subcommittee is another key initiative within the TPB that benefits from the MWRITSA. This subcommittee aims to reduce traffic congestion and improve air quality by promoting alternative commuting options such as carpooling, vanpooling, and telecommuting. The regional ITS architecture supports the Commuter Connections Subcommittee by providing the technological infrastructure needed to manage and disseminate real-time information on traffic conditions, transit options, and ridesharing opportunities. An example of the technological infrastructure aligned with the regional ITS architecture is the mechanism/infrastructure of information flow for real-time traffic information dissemination. This mechanism enables the seamless exchange of traffic data between various sources, such as traffic sensors, cameras, and incident management systems, and disseminates this information to the public through various channels, including dynamic message signs, mobile apps, and websites. Applications aligned with the MWRITSA helps commuters make informed decisions, leading to more efficient use of the transportation network and reduced congestion.

ROLE OF KEY STAKEHOLDERS

The development and implementation of the MWRITSA in the National Capital Region is a collaborative effort involving several key stakeholders as shown in Table 14.2. These stakeholders play crucial roles in ensuring that the MWRITSA meets the region's transportation needs and aligns with broader strategic goals.

TABLE 14.2: KEY STAKEHOLDERS

Planning Agency	Role
State and Local Transportation Agencies	Key implementers of the regional ITS architecture
Federal Highway Administration	Funding and technical support for the development of the regional ITS architecture
Private Sector	Drivers to the evolution of the ITS architecture

State and Local Transportation Agencies

State departments of transportation (DOTs) and local transportation agencies are key implementers of the ITS architecture. These agencies contribute to the design and deployment of ITS projects, ensuring that they address specific local needs and conditions. Examples of these ITS projects include:

- Transit signal priority (TSP) systems are commonly developed and maintained by several TPB member agencies, such as DDOT, MTA, and WMATA, in the National Capital Region.
- DDOT has implemented an Advanced Transportation Management System (ATMS), an ITS-related project, and outlined several ITS-related projects as part of its Smart DC initiative.
- MTA is developing a 50-year vision for coordinated local, regional, and intercity transit across Maryland, incorporating ITS elements.
- WMATA has developed comprehensive bus service guidelines that include ITS elements and implemented a System for Mapping and Analyzing Regional Trends in Transit-Oriented Development (SmartTOD), which incorporates ITS elements to analyze and optimize transit-oriented development in the region.
- The City of Alexandria is implementing a multi-phase ITS Integration project that began in 2009 and extends through 2030, with phases 3 and 4 currently underway.

Specific projects may be found in Visualize 2050 and the FY 2026-2029 Transportation Improvement Program. State and local transportation agencies also provide valuable data and feedback through SPOT subcommittee discussions that help refine and improve the ITS architecture over time.

Federal Highway Administration

The Federal Highway Administration (FHWA) provides funding and technical support for the development of the regional ITS architecture. The agency ensures that the architecture aligns with national ITS standards and best practices, facilitating interoperability and integration across different regions and systems.

Private Sector

Private companies contribute innovative technologies and data that drive the evolution of the ITS architecture. These partners bring expertise in areas such as data analytics, communications, and system integration, helping to ensure that the ITS architecture incorporates the latest advancements in transportation technology. TPB's interaction with private sector partners include:

1. Direct interaction: TPB staff engage directly with private sector partners, such as vehicle probe data vendors, to discuss data sharing agreements, pricing, and technical specifications.
2. Indirect interaction: TPB staff also interact with private sector partners indirectly, through the TPB's member agencies. For instance, member agencies may partner with private companies to deliver ITS projects, such as intelligent traffic signal systems or real-time transit information systems. TPB staff provide technical guidance and coordination support to these efforts, ensuring that they align with regional transportation goals and objectives.

PUBLIC ENGAGEMENT

Public engagement is a critical component of the development and implementation of the MWRITSA. The TPB actively involves the public and various stakeholders to ensure that the MWRITSA meets the needs of the community and enhances the overall transportation network. By actively engaging the public and leveraging the expertise of the Systems Performance, Operations, and Technology Subcommittee and Commuter Connections Subcommittees, the MWRITSA is refined and improved on an ongoing basis to better serve the National Capital Region.

Systems Performance, Operations, and Technology Subcommittee

The SPOT Subcommittee (SPOTS) plays a vital role in public engagement by providing expert advice on the development of the MWRITSA. This subcommittee ensures that the architecture incorporates the latest advancements in transportation technology and aligns with regional goals for system performance and resilience. By leveraging the MWRITSA, the SPOTS helps create a more efficient and resilient transportation network, addressing both current and future transportation challenges. The subcommittee also serves as a regional forum for coordination among TPB member agencies and other stakeholders, facilitating the exchange of information and best practices.

Commuter Connections Subcommittee

The Commuter Connections Subcommittee leverages MWRITSA to provide commuters with real-time information and tools for making informed travel decisions. This subcommittee engages with the public to promote alternative commuting options such as carpooling, vanpooling, and telecommuting, which help reduce traffic congestion and improve air quality. By considering the MWRITSA in its programs, the Commuter Connections Subcommittee ensures that commuters have access to accurate and timely information, enabling them to choose the most efficient and sustainable travel options.