

ARTIFICIAL INTELLIGENCE (AI) FOR INTELLIGENT TRANSPORTATION SYSTEMS (ITS) PROGRAM

EMERGING AND ENABLING TECHNOLOGIES RESEARCH

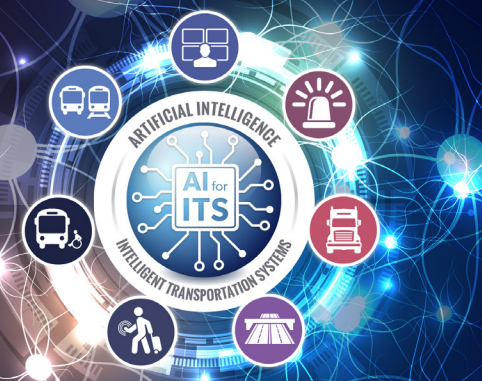








Photo Source: U.S. DOT

AI for ITS Program Overview


The ITS Joint Program Office (JPO) established the AI for ITS Program recognizing the promise AI offers for achieving significant benefits in safety, mobility, efficiency, equity, accessibility, productivity, resilience, and reductions to individual and societal costs, emissions, and other negative environmental impacts.

AI refers to processes that enable systems to augment routine human tasks or enable new capabilities that humans cannot perform. AI can enable or enhance a system's ability to sense and perceive the environment; reason and analyze information; learn from experience and adapt to new situations; and make decisions, communicate, and take actions. In ITS, use of AI can support and augment the actions of traffic management center operators, transit and freight operators, decision-makers, and travelers to ensure safer, more efficient, and equitable travel. AI can be embedded in any system entity (vehicle, mobile device, roadside infrastructure, or management center) or be distributed among many entities in the system.

The AI for ITS Program aligns with the priorities of the Biden-Harris Administration¹ and the U.S. Department of Transportation (DOT)².

 Safety	 Racial and Socioeconomic Equity	 Economic Recovery	 Climate Change	 Innovation	 Infrastructure
Creating a system that is safer for all system users — from drivers to pedestrians	Addressing racial and socioeconomic equity through practical and innovative mobility solutions to underserved communities	Making the system more efficient and economically productive	Reducing climate change impacts by managing systems smarter and incentivizing green choices by travelers	Nurturing innovation to modernize transportation systems	Maximizing infrastructure investments through asset health predictions and efficient resource allocation

Vision



Advance next-generation transportation systems and services by leveraging trustworthy, ethical AI (including machine learning) for safer, more efficient, and accessible movement of people and goods.

Mission



Identify, develop, implement, evaluate, and coordinate technology and policy research to advance the contextualization and integration of AI (including machine learning) into all aspects of the transportation system.

Goal



Cost effectively build and deploy AI for ITS capabilities in real-world modal use.

For more information about this initiative, please contact:

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1 The Biden-Harris Administration Immediate Priorities. <https://www.whitehouse.gov/priorities/>; 2021.
2 The U.S. DOT Secretary's Priorities to Improve Our Transportation System. <https://www.transportation.gov/priorities>; 2021



AI for ITS Program Objectives

The AI for ITS Program has established a set of objectives to achieve its vision, mission, and goal:

- Engage stakeholders to assess needs, gaps, capabilities, and evaluation metrics.
- Foster research and innovation in AI for transportation.
- Deploy high-value use cases in real-world operational environments.
- Measure the impacts of deployments.
- Identify AI-related policy issues and standards needs.
- Accelerate creation and adoption of trustworthy AI by facilitating collaboration and disseminating best practices.

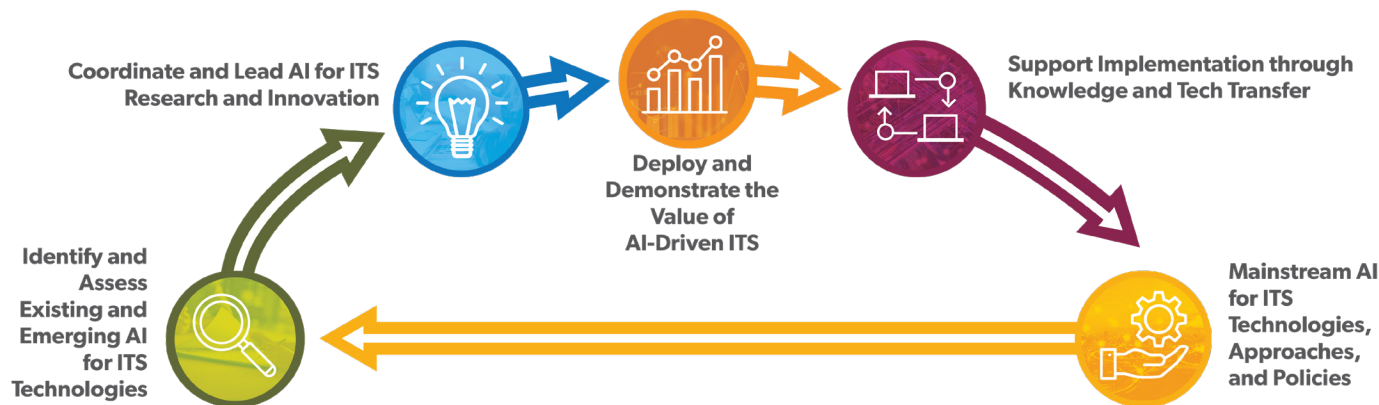
AI for ITS Program Organizing Principles

The following organizing principles were adopted from the Government Accountability Office (GAO) report *Artificial Intelligence – Accountability Framework for Federal Agencies and Other Entities*.³

- Leverage AI to address critical multimodal ITS challenges and needs.
- Promote accountability by establishing processes to manage, operate, and oversee implementation.
- Prioritize security and privacy of sensitive data.
- Promote quality, reliability, and representativeness of data sources and processing.
- Identify precise, consistent, and reproducible performance measures that are consistent with program objectives and measure performance.
- Foster reliability and relevance over time through continuous performance monitoring and assessment of sustained and expanded use.
- Share open data, while protecting privacy, and facilitate open-source development, while preserving intellectual property, to increase richness of available data and code and promote innovation.
- Share lessons learned and best practices to facilitate reproducibility of applications and accelerate adoption of AI-driven next-generation ITS nationwide.

Approach

To achieve the program objectives, the AI for ITS Program has identified an approach (illustrated below) that aligns with its organizing principles as well as the *ITS JPO Strategic Plan 2020-2025*.⁴



³ *Artificial Intelligence - An Accountability Framework for Federal Agencies and Other Entities*. GAO-21-519SP, June 2021. 2020.

⁴ *Intelligent Transportation Systems Joint Program Office Strategic Plan 2020-2025*. FHWA-JPO-18-746, May 2020.