

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

Photo Source: U.S. DOT

Real-World AI Scenarios in Transportation for Possible Deployment

The *Identifying Real-World Transportation Applications Using Artificial Intelligence (AI): Real-World AI Scenarios in Transportation for Possible Deployment* report (July 2020, **FHWA-JPO-20-810**) identifies practical real-world scenarios where AI offers the potential to address specific transportation needs. These high-value scenarios serve as a template for potential deployments that demonstrate the transformational power of AI to address ITS operational challenges.

To view the report, please visit: <https://rosap.ntl.bts.gov/view/dot/50752>

The report identifies five real-world scenarios: Urban Arterial Network, Urban Multimodal Corridor, Regional System Management, Rural Freeway Corridor, and Underserved Communities. The report defines these scenarios by their unique operational challenges (e.g., coordinating multi-agency responses), principal facility types covered (e.g., urban arterial), and key user types served (e.g., underserved communities, long-haul truck driver).

For each scenario, the report: (1) discusses how AI could potentially be used to address operational challenges relevant to that scenario, (2) illustrates a concept for the scenario where actors interact with the AI-enabled systems, and (3) summarizes potential benefits and value to the U.S. Department of Transportation (DOT) of investing in AI-powered solutions for the scenario.

Potential Benefits



Safety



Mobility and Reliability



Accessibility



Sustainability



Productivity



Security



Cost Savings



User Satisfaction



ITS JPO HIGH-PRIORITY RESEARCH AREAS

- ▶ Automation
- ▶ Data Access and Exchanges
- ▶ Emerging and Enabling Technologies
- ▶ Cybersecurity for ITS
- ▶ Complete Trip – ITS4US
- ▶ Accelerating ITS Deployment



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.



AI FOR ITS PROGRAM

	Scenario	Description
	Urban Arterial Network	Urban arterial networks are low and medium-speed, mixed-use facilities that provide access to and from traffic generators and attractors, typically managed within jurisdictional boundaries by individual local agencies.
	Rural Freeway Corridor	Rural freeway corridors are high-speed, limited-access divided facilities that run outside urbanized areas across multiple states and counties, typically managed by multiple agencies.
	Urban Multimodal Corridor	Urban multimodal corridors are combinations of highways and arterial streets that serve as major regional travel routes, typically managed collaboratively by a group of state, regional, and local agencies.
	Regional System Management	A regional system is an interconnected network of transportation facilities, agency jurisdictions, and ITS assets that is managed collaboratively by multiple agencies (often as a regional planning organization).
	Underserved Communities	Underserved communities are neighborhoods and communities with limited access to reliable public transportation and shared mobility services or whose needs are not met sufficiently by existing transportation services.

Potential Barriers to Adoption of AI For ITS

- ▶ Data
- ▶ Bias
- ▶ Privacy
- ▶ Talent/Workforce
- ▶ Compute Power
- ▶ Generalization
- ▶ Ethics and Equity
- ▶ Stakeholder Acceptance
- ▶ Hardware
- ▶ Obsolescence
- ▶ Liability
- ▶ Risk Aversion

Potential Opportunities for U.S. DOT Investments in AI For ITS

- ▶ Spur adoption of AI-enabled solutions by funding AI research, demonstrations, and deployments that would not otherwise be accomplished by the public or private sectors
- ▶ Facilitate interoperability of AI-enabled ITS applications
- ▶ Encourage peer exchanges and collaboration on complex AI solutions
- ▶ Establish confidence in AI solutions through independent evaluations and dissemination of best practices

To learn more about the program, visit: https://its.dot.gov/research_areas/emerging_tech.htm, or contact:

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