# 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.

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U.S. Department of Transportation

# 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
- Compute Power
- Hardware
- Bias
- Generalization
- Obsolescence
- Privacy
- Ethics and Equity
- Liability
- Talent/Workforce
- Stakeholder Acceptance
- 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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