

AI & Project Delivery Opportunities

FHWA CLAS Innovation Exchange
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U.S. Department of Transportation
ITS Joint Program Office

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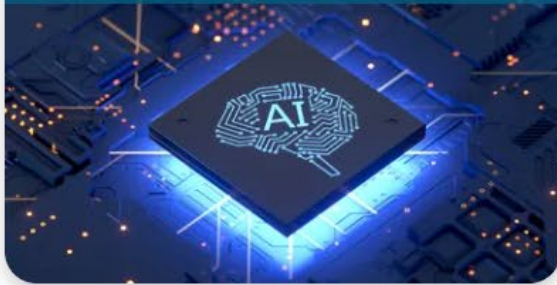
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ITS JPO Mission & Program Areas

ARTIFICIAL INTELLIGENCE (AI)



AUTOMATION PROGRAM



AI FOR TRANSPORTATION PLANNING AND DESIGN



SMART COMMUNITY RESOURCE CENTER (SCRC)



INTEROPERABLE CONNECTIVITY/SPECTRUM



INTERSECTION SAFETY



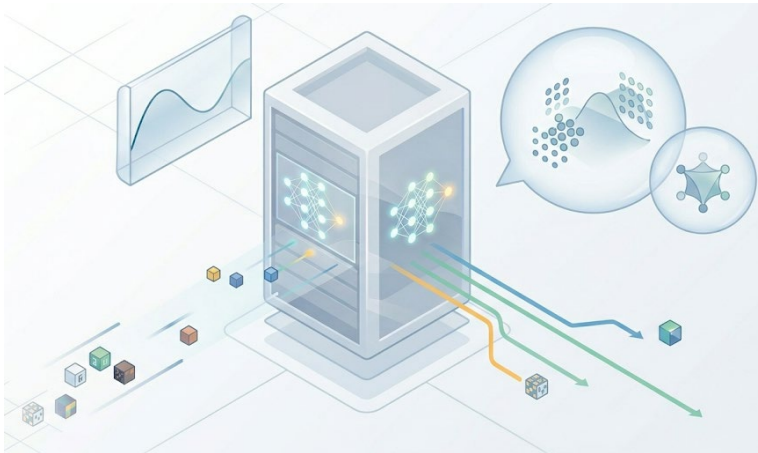
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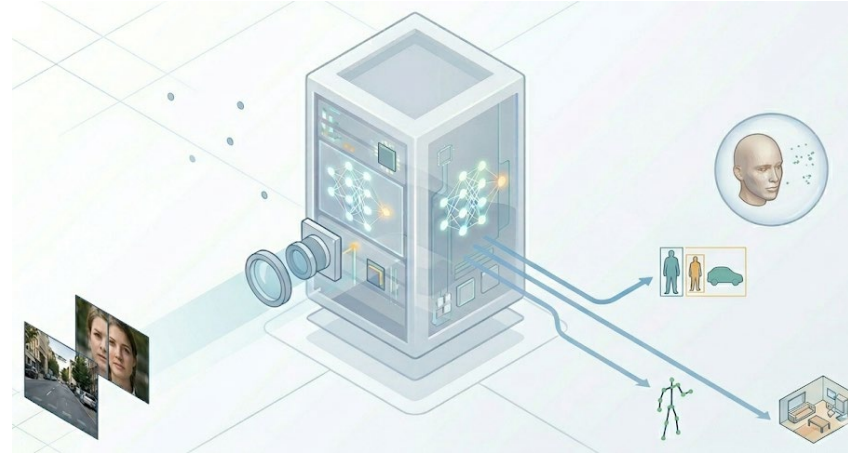
VEHICLE-TO-EVERYTHING (V2X) DEPLOYMENT



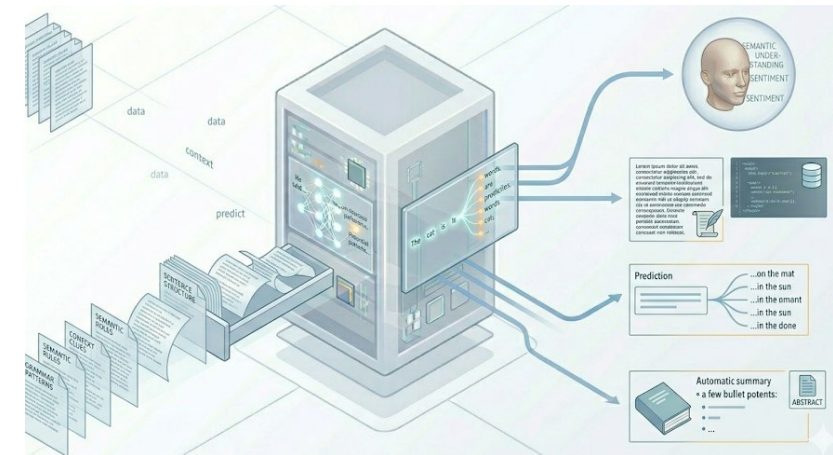
What is AI?



Machine learning (NUMBERS)



Computer vision (IMAGES)



Generative AI (LANGUAGE)

Image Source: Gemini

What is Project Delivery in Transportation?

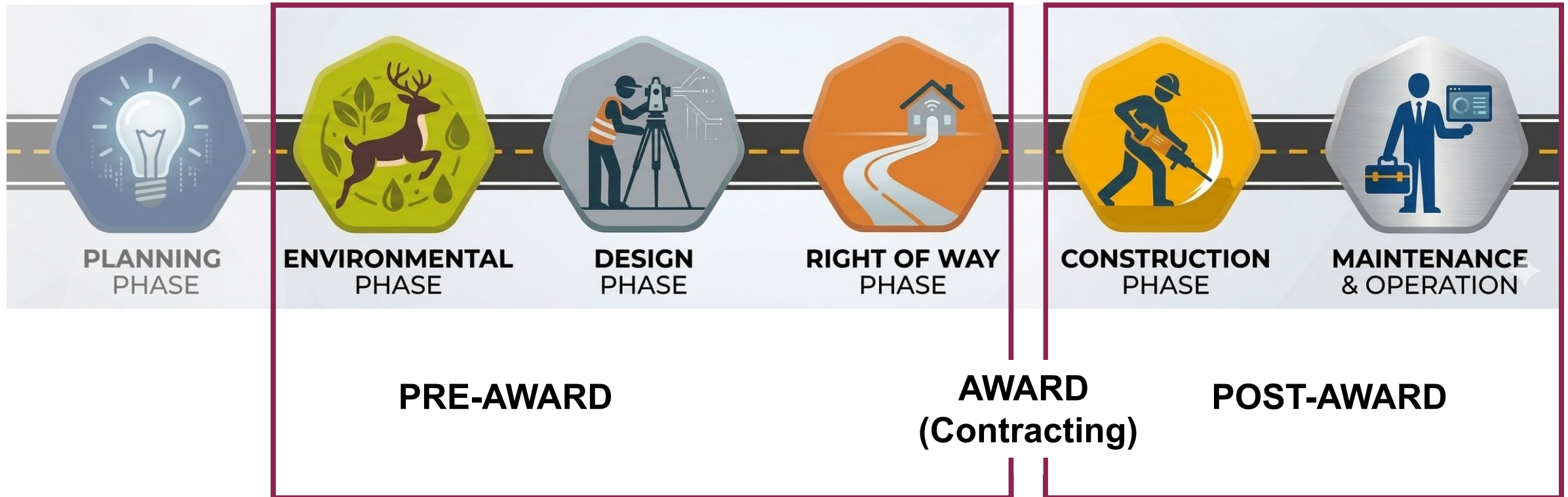


Image Source: Gemini

AI & Project Delivery: The Big Picture

How can AI support more predictive, data-driven execution of all aspects of transportation project delivery?

- Better insights and decisions for increasingly complex projects
- Improved project-level risk management
- Strategic project benefits (time, quality, cost)
- Opportunity for continuous project intelligence



Image Source: Gemini



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Environment & AI

Key Activities

- **National Environmental Protection Act (NEPA)**
 - Conduct studies
 - Draft Environmental documents
- **Permitting**
 - Secure permits and approvals
- **Public Involvement**
 - Project-specific workshops

Example AI Applications

- Habitat and wetland mapping
- Environmental impact simulation
- Public comment sentiment analysis
- Research effective mitigation measures



Design & AI

Key Activities

Preliminary Engineering (PE)

- Develop 30% design plans

Final Design

- Finalize design
- Create Plans, Specifications, and Estimates (PS&E) package

Example AI Applications

- Design standard compliance
- Design optimization
- Predictive safety modeling
- Predictive soil modeling



ROW/Utility Coordination & AI

Key Activities

Utility Mapping and Coordination

- Locate and move water, gas, fiber, etc. that conflict with project design

Property Valuation

- Appraise land or easements for construction

Negotiation and Relocation

- Purchase property and assist displaced residents

Example AI Applications

- Utility mapping and conflict avoidance
- Automated deed and title extraction
- Land-use verification
- Predictive property valuation

Contracting/Procurement & AI

Key Activities

Bid Proposals

- Draft RFP/IFB
- Advertise opportunity

Proposal/Bid Evaluation

- Review contractor qualifications, pricing, and proposed schedules

Contract Award

- Select contractor
- Execute legal agreements

Example AI Applications

- Contractor risk scoring
- Automated RFP compliance checking
- Automated bid tabulation and flagging
- Predictive cost modeling



Construction & Project Management

Key Activities

Construction Administration

- Manage schedules
- Process change orders
- Track budget

Quality Assurance & Quality Control

- Inspect pavement, software, etc. against standards
- **Work Zone Management**
 - Set up detours
 - Monitor safety

Example AI Applications

- Computer vision for construction progress tracking
- Real-time hazard detection
- Delay prediction
- Pavement inspection



Project Closeout & AI

Key Activities

Final Inspection

- Review project
- Identify outstanding issues

Asset Handover

- Complete project data, warranties, manuals

Example AI Applications

- Visual AI inspections
- Automated punch list assignment and resolution
- Asset metadata extraction from final as-built project



Project Operations & Maintenance

Key Activities

- Project-specific operations
- Project-specific maintenance

Example AI Applications

- Asset health monitoring
- Predictive maintenance
- AI-supported training
- Real-time performance analytics

AI & Project Delivery Take-aways

- AI can help at all phases of project delivery.
- Human validation remains important.
- Quality data inputs for AI is key.
- AI can help deliver projects faster, cheaper, and with greater quality.



Image Source: Gemini



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How We Support You



Development Tools



Field Testing & Pilots



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Guidance for Trustworthy AI



Webinars & Outreach

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