NJDOT-BRIIT AI Research and Pilots

NASTO25 Conference,
New Brunswick, NJ
July 8-10, 2025

Presented by Giri Venkiteela,PhD
Innovation Officer
BRIIT
July 9, 2025

NEW JERSEY DEPARTMENT OF TRANSPORTATION

Outline

- Introduction
- AI Overview
- NJDOT-BRIIT-AI Research Vision
- NJDOT –BRIIT –AI Research Framework
- Conclusions

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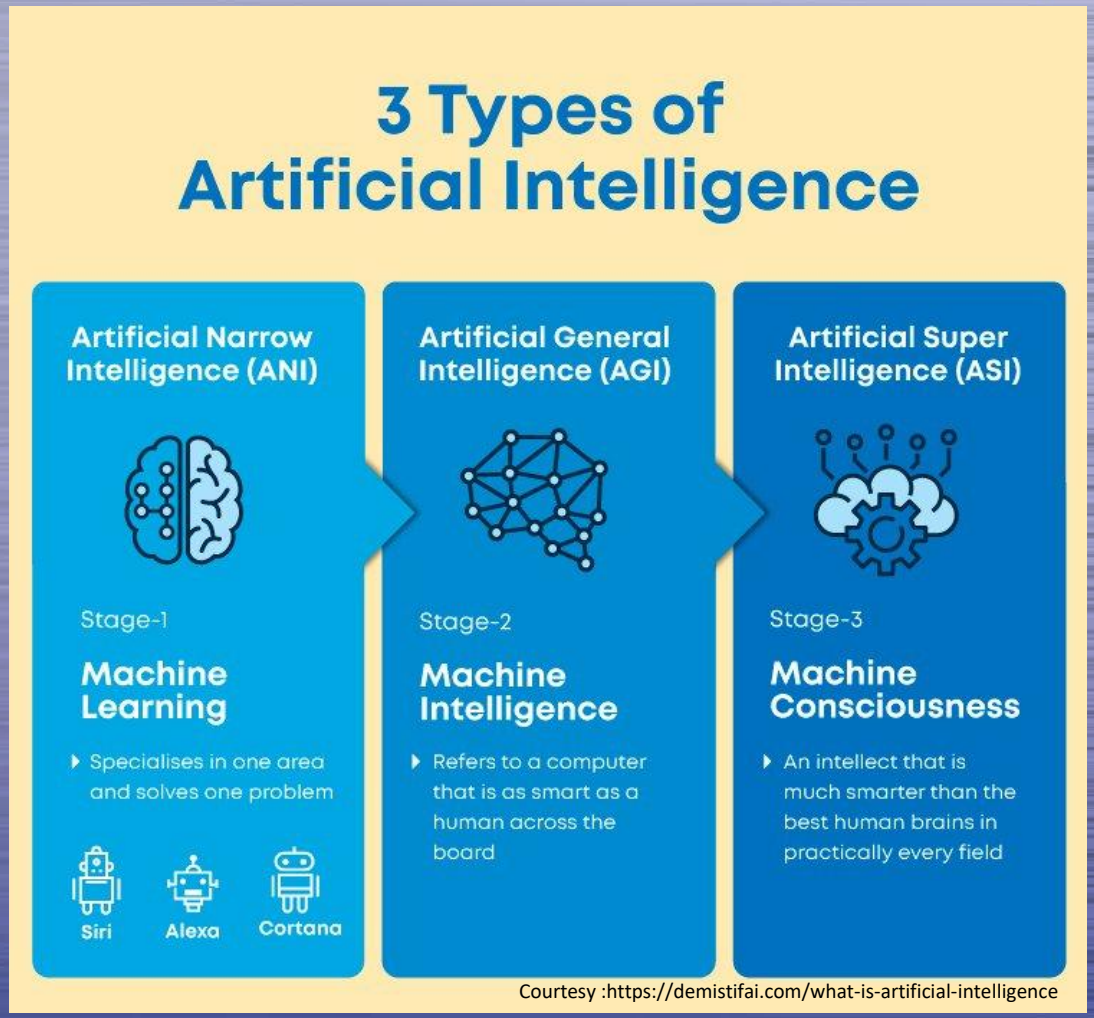
What is AI?

Analytical Artificial Intelligence

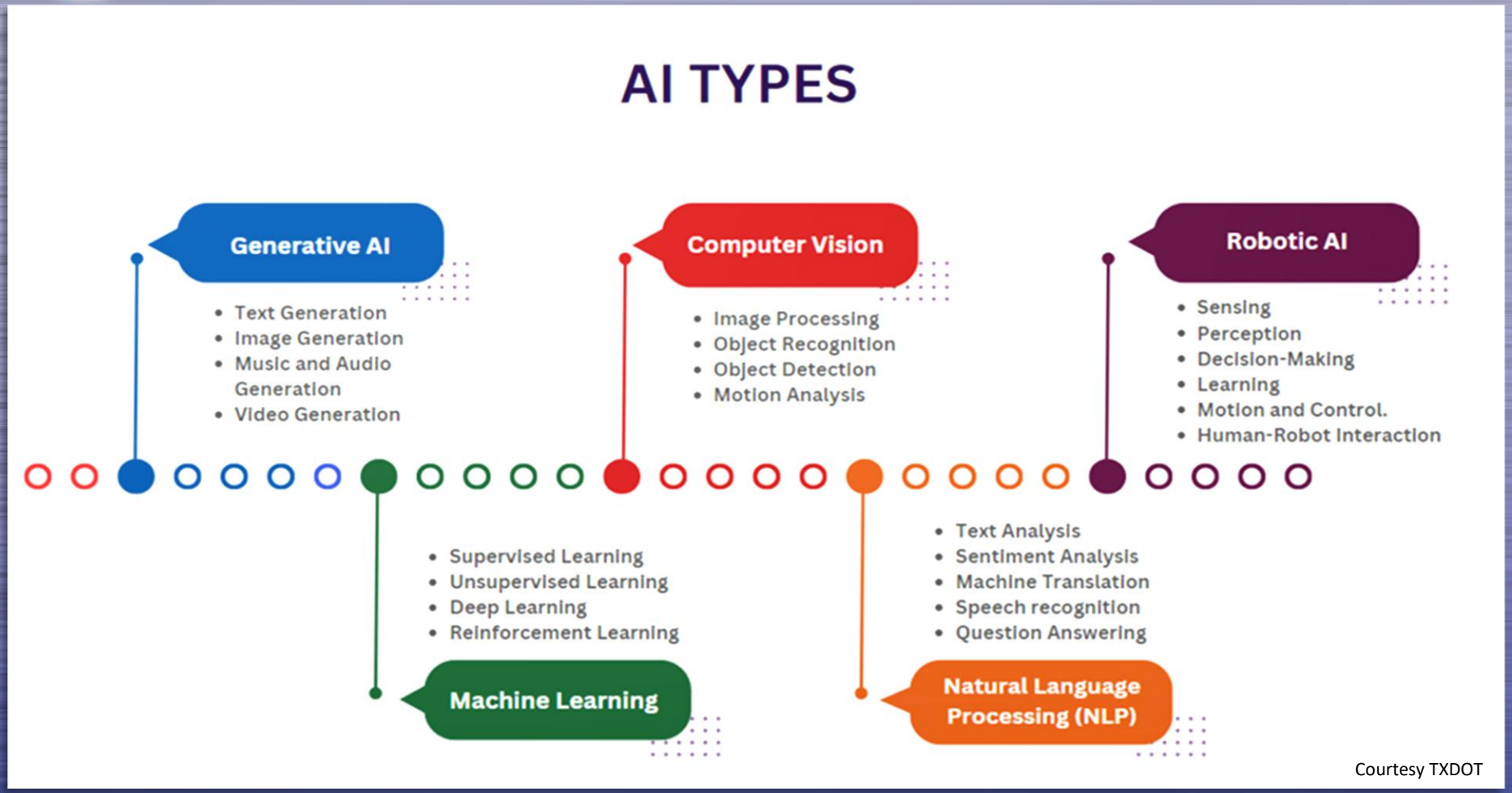
Making predictions based on patterns in data

Generative Artificial Intelligence

Making new content based on patters in data



Courtesy :https://demistifai.com/what-is-artificial-intelligence



Courtesy TXDOT

AI applications in DOTs

- Autonomous Vehicles
- Traffic Management
- Predictive Maintenance
- Route Optimization
- Driver Assistance Systems
- Public Transportation Systems
- Logistics and Supply Chain Management
- Maritime Transport
- Safety and Surveillance
- Demand Forecasting
- Designs
- Customer Service and Experience
- Others

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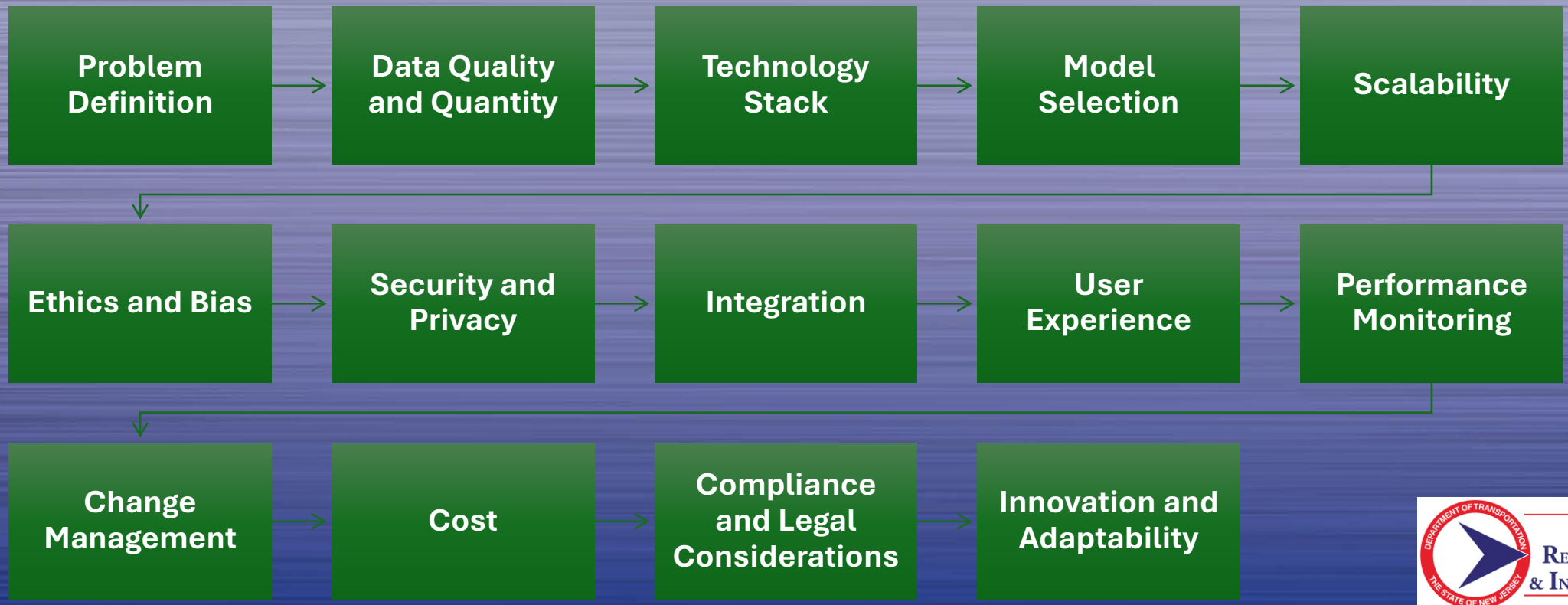
Most important things to consider when implementing AI applications



TRB_RIIM_Emerging Technologies survey on AI among TRB standing committees

25 TRB committees' representatives participated, covering diverse areas such as public transportation, pavement management, roadside maintenance, and infrastructure management.

The survey reflects varied perspectives on AI's role in transportation, influenced by each committee's specific focus area.

Committees Involved

AJE35	AME30
AJE45	AKC70
AKP50	ACP30
ACP25	AEP50
AMR50	AED80
AKR20	AP050
ACP35	AKR50
AP010	AKG70
AP025	AKG60
ACP20	AR070
	AKT50

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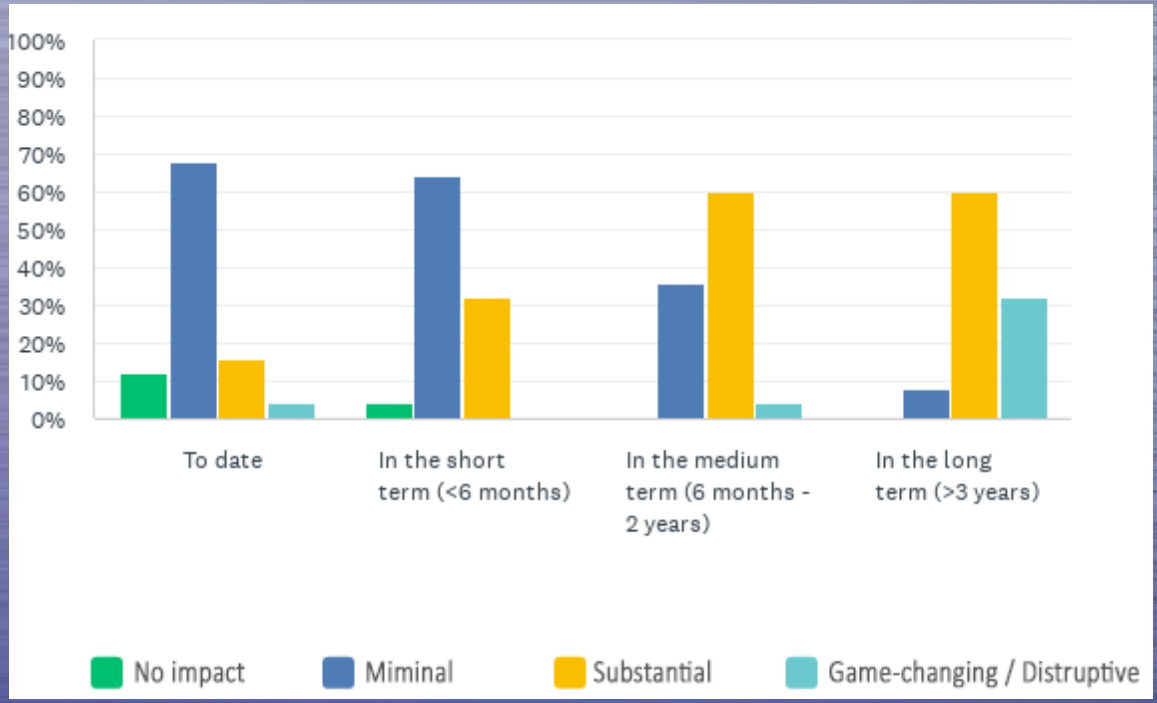
Committees Response on AI Impact

Most committees report **minimal** impact from AI **currently (as of Jan 2025)**, indicating early stages of adoption or exploration. But they indicate a **substantial** influence in **future**



Committees Response on Frameworks/Resources

Only 3 committees have identified or developed frameworks/resources to address AI knowledge gaps.

The lack of existing resources suggests opportunities for shared learning and collaboration across committees.

AI Common Knowledge Gaps Identified

Data quality and standardization

Ethical considerations

Integration challenges

Understanding of AI technologies

Strategies to Bridge Knowledge Gaps

Education and Training:

- Organize tailored workshops and seminars for different expertise levels to enhance understanding of AI tools and applications.
- Develop online courses and certifications in AI in collaboration with universities and online platforms.

Research and Development:

- Foster partnerships with academic institutions and industry for joint research projects.
- Encourage pilot projects to test AI applications in real-world scenarios, such as traffic management or safety enhancements.

Frameworks and Guidelines:

- Develop guidelines for consistent data practices to improve AI model training and reliability.
- Establish ethical guidelines to ensure fairness and transparency in AI applications.

Strategies to Bridge Knowledge Gaps

Knowledge Sharing:

- Create online platforms for sharing AI insights, case studies, and best practices among committees.
- Document and analyze successful AI implementations to serve as references for other committees.

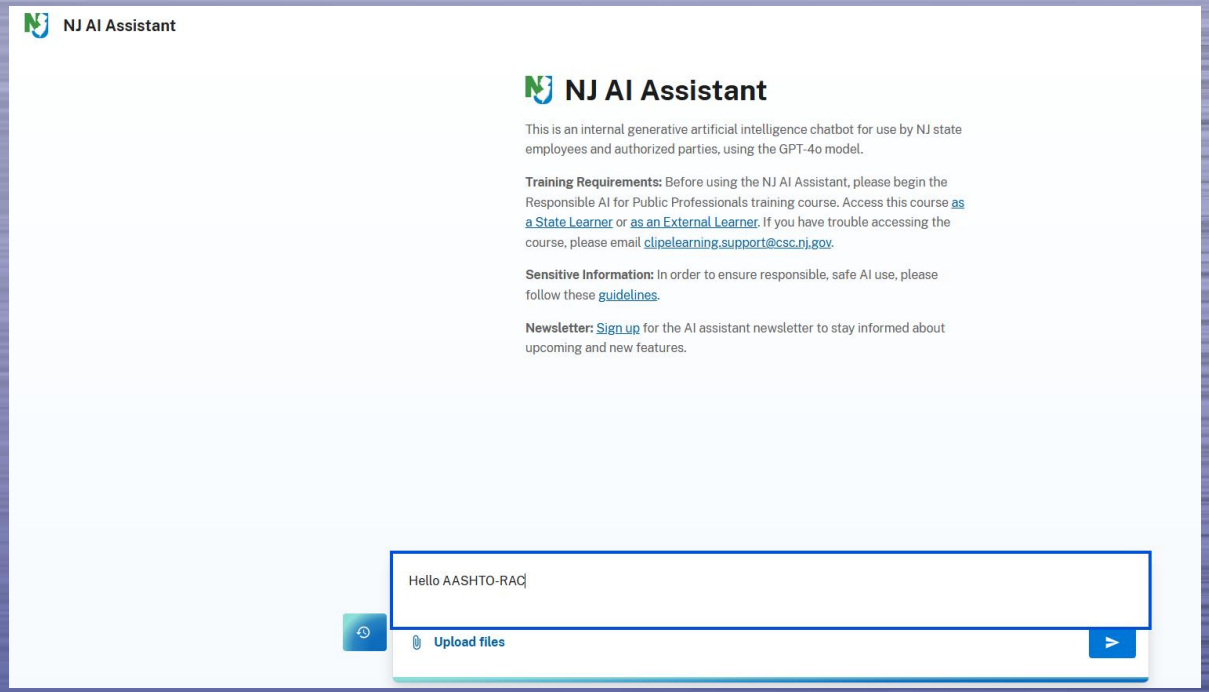
Investment in Technology:

- Provide committees with access to advanced AI tools and technologies for experimentation and learning.
- Secure funding for AI research and development initiatives to explore innovative solutions.

NJ AI ASSISTANT

Office of the Governor | Governor Murphy Establishes State Artificial Intelligence Task Force (nj.gov)

OCTOBER 10, 2023



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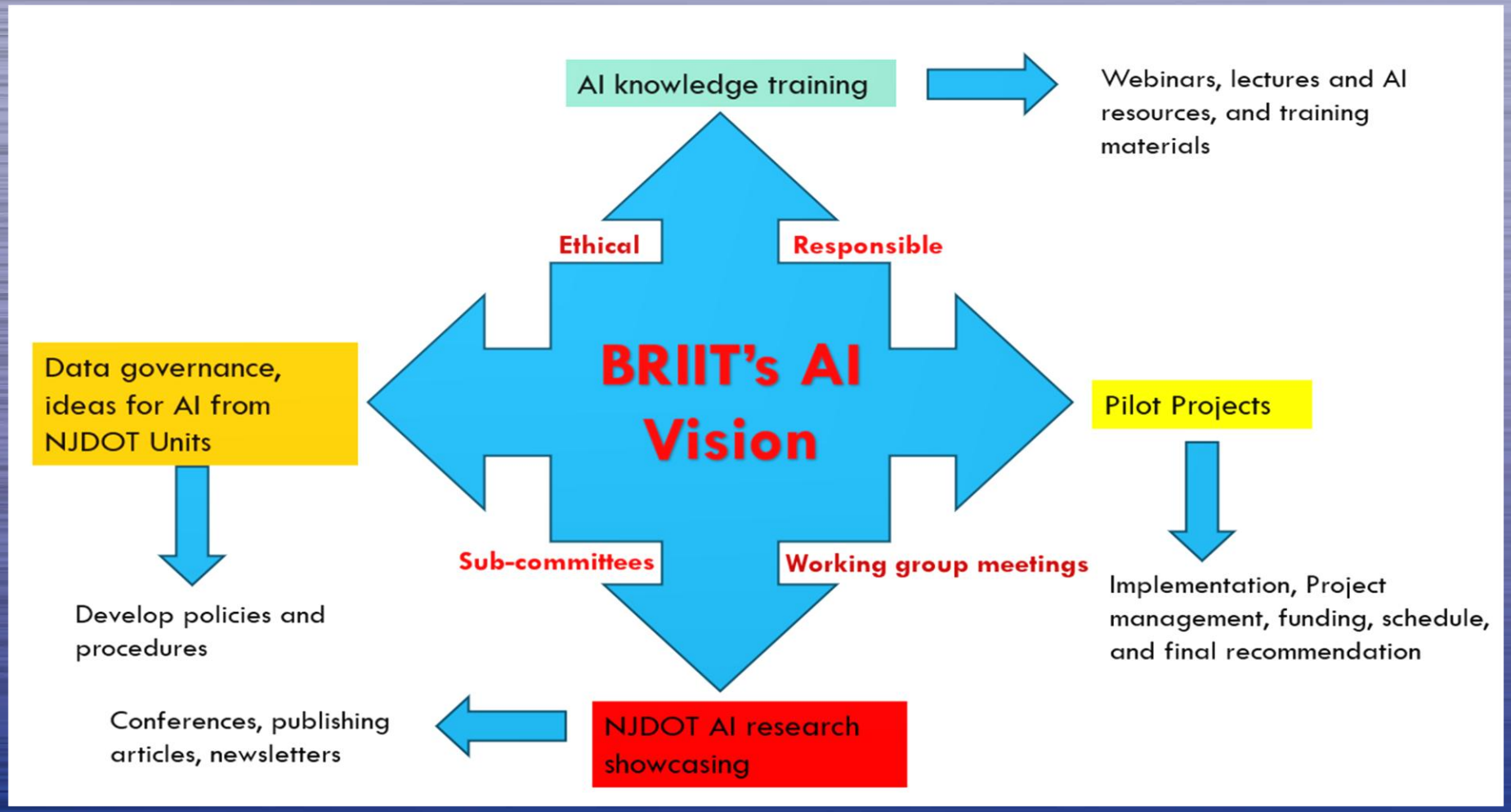
BRIIT's AI Research Vision



NJDOT-BRIIT-AI Research Initiatives

- A working group for AI research and pilots
- Systematic identification of use cases
- Pilot research studies
- AI knowledge sharing and training
- Reporting (Internal and External)

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NJDOT-BRIIT-AI Working Group Members

STATEWIDE PLANNING	TRANSP. DATA & SUPPORT	CONSTRUCTION & MATERIALS	CAPITAL PROGRAM SUPPORT	PROJECT MANAGEMENT	MARITIME RESOURCES
BRIDGE ENGR & INFRAST MGMT	HUMAN RESOURCES	SUPPORT SERVICES	ACCOUNTING &EXTERNAL AUDIT	CIVIL RIGHTS&AFFIRM ACTION	DRAWBRIDGE OPERATIONS
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NJDOT-BRIIT-AI Working Group Key Activities

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Conclusions

- Sharing resources and developing AI frameworks' are essential for successful AI implementation
- Understanding the data is key
- Safe and ethical use of AI can promote productivity in workforce
- Research and pilot are key for full implementation of AI products

BRIIT Resources

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https://www.njdottechtransfer.net/

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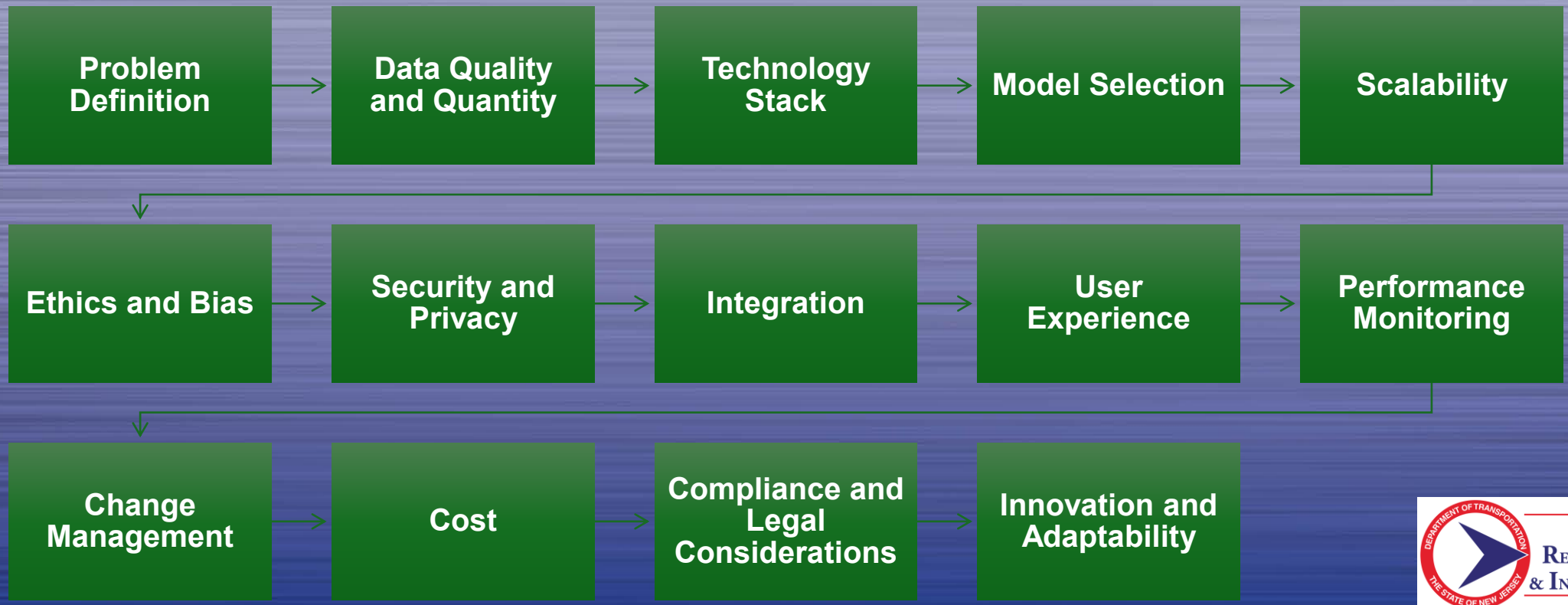

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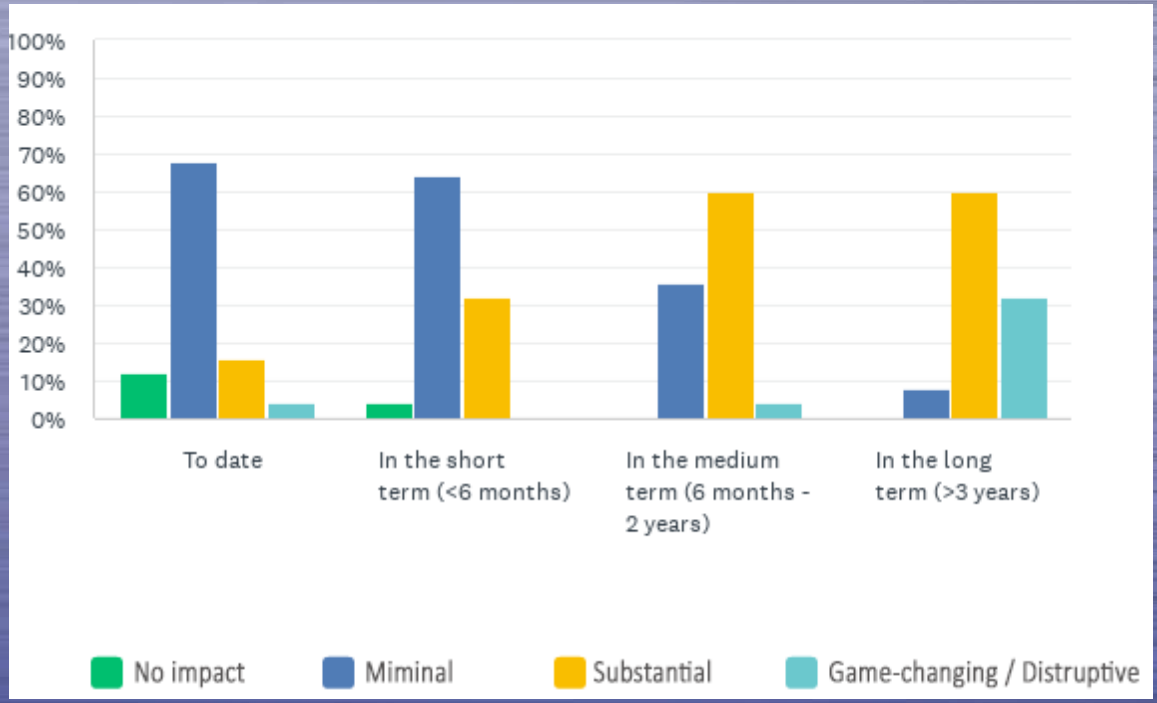

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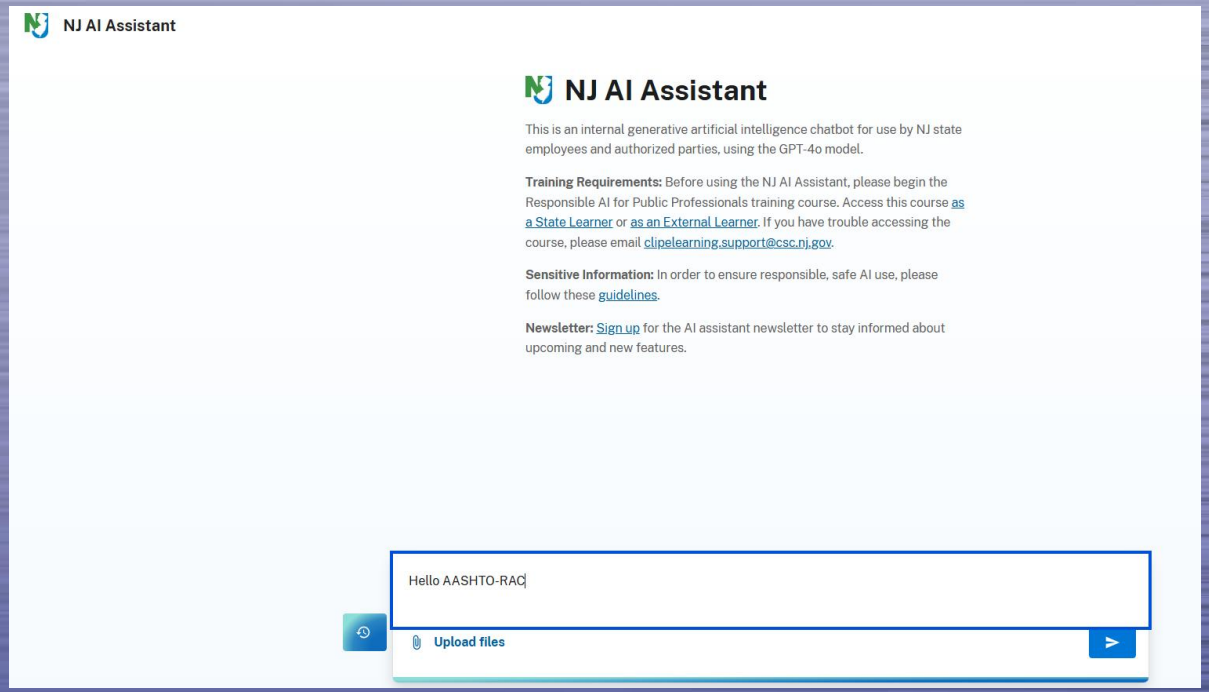

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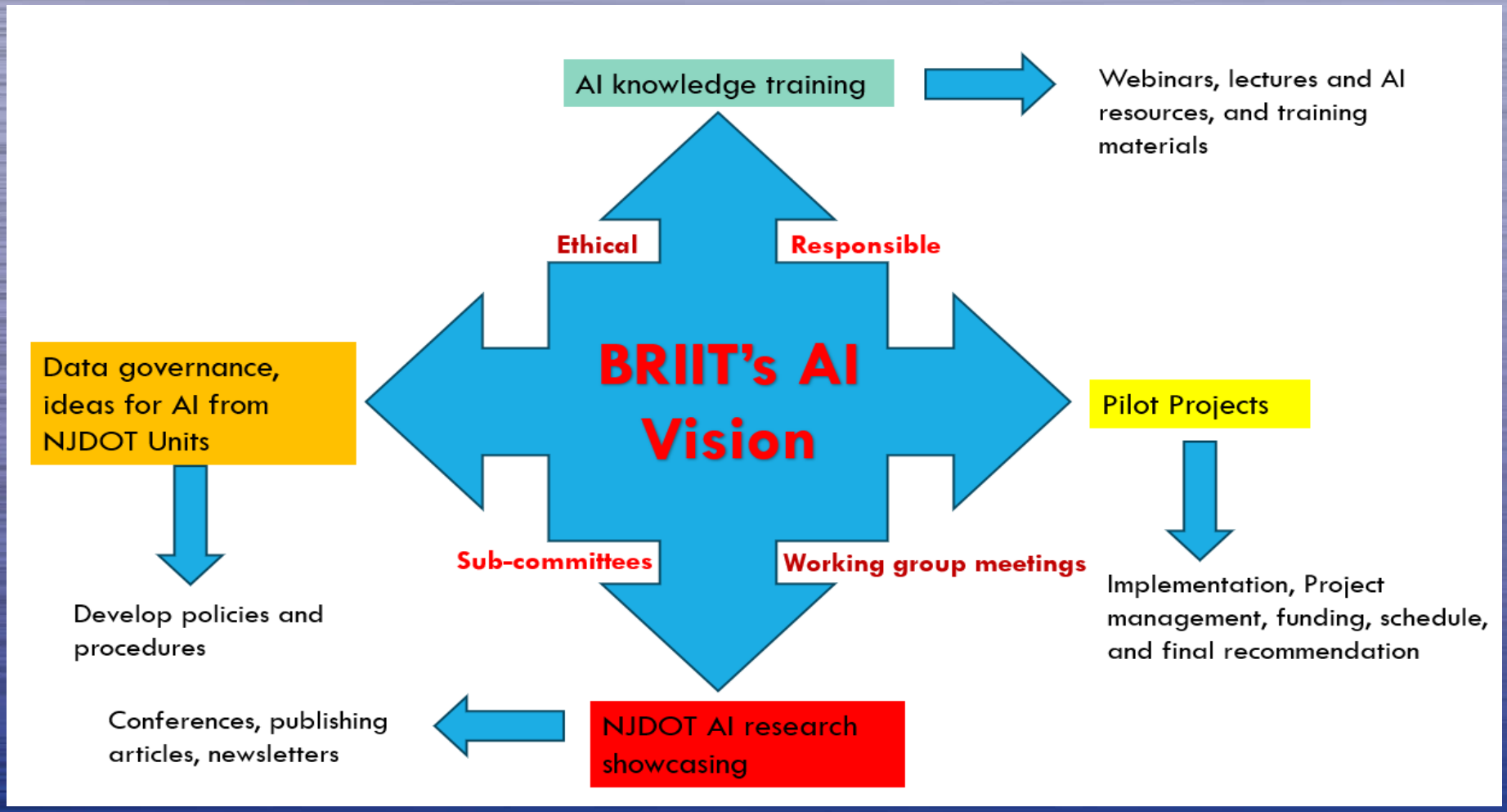

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Artificial Intelligence in State DOTs

Peer Exchange

San Diego, CA | February 4-5, 2025

Final Report

Hosted by Caltrans

Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

Peer Exchange Agenda

Day 1: February 4, 2025

- Welcome and Opening Remarks by Dara Wheeler, Chief, Division of Research, Innovation, and System Information, Caltrans and Marcie Kahbody, Agency Information Officer, California State Transportation Agency
- AI and Transportation Introduction Presentation by Diego Morales, AI Strategist, Delegata
- Overviews of States' AI Efforts by Participants
- Discussion: AI Governance and Strategy
- Discussion: Workforce AI Readiness and Adoption
- Discussion: AI Use Cases and Opportunities
- Summary of Day 1

Day 2: February 5, 2025

- Federal AI Transportation View Presentation by Vinn White, Former USDOT Chief AI Officer
- Update from FHWA
- Discussion: AI Transportation Pool Fund Proposal
- AI Risks and Security Introduction Presentation by Karl Kopper, Agency Information Security Officer, California State Transportation Agency
- Discussion: AI Ethics, Risks, and Security
- AI and Data Introduction Presentation by Chad Baker, Geospatial Data Officer, Caltrans and Caleb McCallister, Enterprise Data Manager, Caltrans
- Discussion: AI and Data Management
- Discussion: Takeaways and Calls to Action
- Closing Remarks

Peer Exchange Attendees

Participants

Roberto Barcena - TRB/NCHRP
Chad Baker - Caltrans
Ben Bressette - Caltrans
Tay Dam - FHWA - California Division
Jenni Hosey - Missouri DOT
Marcie Kahbody - CalSTA
Karl Kopper – CalSTA
Aubrey Lara - Delegata
Sally Mayer - Kansas DOT
Caleb McCallister - Caltrans
Ben McCulloch - Texas DOT
Amira Menoufy - Delegata
Diego Morales - Delegata
Jesse Newberry - Former Massachusetts DOT/HNTB
Emily Parkany - Vermont Agency of Transportation
Bhaskar Rudrakshala - Caltrans
Craig Thor - FHWA - Turner Fairbank Hwy Research Center
Gabriella Tsurutani - MNIT - Minnesota DOT
Giri Venkiteela - New Jersey DOT
Jennifer Volkening - Utah DOT
Russ Watts - Caltrans
Dara Wheeler - Caltrans
Enid White - Wyoming

Peer Exchange Insights and Key Takeaways

State	AI Policy?	AI Training?	AI Officer?
California	Yes	Yes	In Progress
Kansas	Yes	Not Yet	Not Yet
Massachusetts	Yes	Not Yet	Not Yet
Minnesota	Yes	Yes	Not Yet
Missouri	Yes	In Progress	Not Yet
New Jersey	Yes	Yes	Not Yet
Texas	Yes	Yes	Not Yet
Utah	Yes	In Progress	Not Yet
Vermont	Yes	Not Yet	Yes
Wyoming	Yes	Not Yet	Not Yet

Peer Exchange Insights and Key Takeaways

- **AI as a Driver:** AI's buzz and popularity can be the motivating factor to get leadership to prioritize data reform efforts. Show leaders how AI depends on data governance.
- **Authority and Roles:** DOTs need a clear leadership role with real authority (a Chief Data and/or AI Officer) who can drive change. One single champion with business, data, and AI knowledge to bridge silos is needed.
- **Fail Fast / Learn Quickly:** It's okay to fail at pilot projects if you learn and adapt quickly.
- **Data Matters:** Data is crucial. Prioritizing data quality and management is essential for AI success.
- **Peer Collaboration is Key:** AI presents opportunities for multi-state partnerships, research, and shared lessons. More peer exchanges will help states learn from each other.
- **States Must Step Up:** Each DOT must increase its own efforts—no one else (including vendors) can do it for them. Agencies should take initiative and learn from successful AI implementations elsewhere.
- **Common Pace:** Many agencies are neither fully behind nor ahead, so they can learn from each other. In addition, avoid falling too far behind or advancing too quickly in AI implementation.

Peer Exchange Call to Action

- **Leveraging Existing Resources:** NCHRP, TRB committees, FHWA, AASHTO, etc. to glean and adapt best practices.
- **Central Repository:** Possibly create a collaborative platform to share AI/data references, resources, ongoing research, contacts, etc.
- **Develop Research Problem Statements:** Identify key areas for further study, focusing on high-priority AI/data topics.
- **Amplify Messages:** All participants should share lessons internally, to push for data readiness in AI contexts. Use AI's popularity to justify data quality improvements. Share success and failure stories and use storytelling to highlight lessons learned.
- **Transportation Pooled Fund:** Follow through on a TPF concept or study and explore forming an AI in Transportation working group.
- **Designate Leadership:** Assign decision-makers and dedicated staff with a unified vision aligning AI and data governance with organizational goals.
- **Continue the Discussion**: Organize another Peer Exchange to continue exploring and sharing AI considerations and advancements, including measuring performance and benefits.

Peer Exchange Survey Questions

Poll Results: Does your organization have an AI Strategy?

- **28%** Yes
- **56%** Working on it
- **17%** Not yet

Poll Results: How would you rate your organization's AI literacy/awareness?

- **7%** Highly aware
- **33%** Generally aware but awaiting policy and training
- **60%** Not yet engaged in enterprise-wide AI awareness

Poll Results: What are your main concerns regarding AI ethics, risk, and security?

1. **Data Quality and Integrity**
2. **Bias and Misinformation**
3. **Data Security**
4. **Privacy**
5. **Transparency**

Poll Results: Does your organization have an enterprise data policy?

- **60%** Yes
- **30%** In progress
- **10%** Not yet

Poll Results: Does your organization have any use cases/proofs of concept currently in progress?

- **65%** Yes
- **24%** In progress
- **12%** Not yet

Thank you

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