AI/ML for Traffic Management and Smart Cities

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What does transportation safety and reliability mean for DOTs?

1. Real-Time
   DOTs seek to ensure safety for all roadway users and develop innovative approaches for today and tomorrow.
   2023 Strategic Highway Safety Plan (SHSP)

2. Near-Real Time
   Regional organizations seek to identify trends and high-risk corridors through big data to preempt safety incidents.
   Boston Region MPO Vision Zero Action Plan

3. Long-Term
   Planners seek to safely transform infrastructure for multimodal use and maximize equity and efficiency.
Massachusetts must optimize our multimodal infrastructure to achieve safety goals. Once-abstract challenges in transportation and land-use are now felt viscerally in our local communities. The Commonwealth’s Leaders at all levels can continue to lead national trends through AI innovation.

**TRANSIT RIDERS**
2023 poll says 70% of current / past MBTA riders have felt unsafe due to infrastructure. [Link]

**ROADWAY TRAFFIC**
417 fatalities in 2021, State Roadway Safety Report. [Link]

**PEDESTRIAN & BICYCLIST TRAFFIC**
101 pedestrian deaths in 2022. [Link]

**TRANSPORTATION WORKFORCE**
Five “near misses” between trains and workers, Mar-Apr 2024. [Link]
Complement existing safety campaigns with coordinated, next-generation analytics and insights.

**DESCRIPTIVE**
Capture data and generate reports and dashboards to **create shared understanding**

**DIAGNOSTIC**
Use data and analytics to **detect incidents and identify causes** for monitoring and planning

**PREDICTIVE**
Use AI/ML to **predict incidents and provide warnings** to incident prevention and identify future needs

**PRESCRIPTIVE**
Leverage GenAI for data-driven solutions to **optimize infrastructure and prioritize mitigation**, and enable leaders to make real-time and strategic decisions.
Generative AI implementation for DOTs

**Data Ingestion Pipeline**
- Fuse Multimodal Sensor Data
- Vision LLM

**Recommendation Engine (Model Suite)**
- ML/DNNs
- Pretrained Fdn. Models
- Finetuning for Rec's

**Gen AI Query Module**
- LLM API
- Traffic Operations Interface

**APPROACH**
- Cloud-based, scalable platform
- Advanced, pretrained multimodal large-language models (LLMs)
- Differentiated design for transportation
- Trustworthy AI design and approach
- Leading technology, data, and advisory team
- Experienced partnership in transportation
Hand-in-hand with our partners, we generate these insights through AI/ML, simulation, and optimization.

**DELOITTE TECHNOLOGY ASSETS & ACCELERATORS**

**Futurescape**
Modeling and simulation tool that creates digital twins of large-scale systems to explore “What If” and “What Next” scenarios for more informed decision-making.

**Optimal Reality™**
Decision support tool helping agencies run millions of permutations on a digital replica of their network to drive optimal decision making for real-time congestion management.

**Dynamic Incentivization**
Dynamic Incentivization engine that uses behavioral insights to influence driver behavior through incentives, challenges, and rewards programs.
We help transportation agencies solve their biggest challenges, and we’ve been helping agencies innovate and transform for more than 40 years.

**Trusted Client Advisory**
World-class consulting services, including strategy and analytics, customer experience, tech modernization, and human capital

**Leading Technology**
Innovative solutions and leading digital transformation services to meet today’s challenges and tomorrow’s needs

**Global Industry & Alliances Network**
Consulting relationships with 85% of the Fortune 500, and a global alliance network with the most innovative tech leaders

**Thought Leadership & Industry Insights**
Cutting-edge research published in external publications & in-house journals, convening industry leaders in major forums
Questions?

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