Artificial Intelligence and Transportation Planning
Opportunities and Risks

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ARTIFICIAL INTELLIGENCE AND TRANSPORTATION PLANNING

OPPORTUNITIES AND RISKS

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presented by
Cambridge Systematics, Inc.
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AI in Transportation Planning:

1. Data Collection and Analysis:
   - Utilizing AI for gathering transportation data (traffic flows, congestion patterns, etc.)
   - Analyzing massive datasets for insights and trends
   - Example: Using AI to analyze traffic camera footage to optimize signal timings

2. Predictive Modeling:
   - Forecasting future transportation needs and demands
   - Predicting traffic patterns and congestion hotspots
   - Example: AI-driven models for predicting public transit ridership

3. Optimization and Decision-Making:
   - Assisting in the design and planning of transportation infrastructure

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AI IS NOT NEW...
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1760s Industry
Mechanisation, water & steam power

1870s Industry
Mass production, electricity

1970s Industry
Computers, automation, robotics

2000s Industry
Internet, data analytics, connectivity

Today Industry
Human-machine cognition, mass customization

5TH INDUSTRIAL REVOLUTION
## 5th Industrial Revolution

<table>
<thead>
<tr>
<th>Year</th>
<th>Industry Type</th>
<th>Key Innovations</th>
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</thead>
<tbody>
<tr>
<td>1760</td>
<td>Industry 1.0</td>
<td>Mechanization, water &amp; steam power, Steamship, railroad</td>
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<tr>
<td>1870</td>
<td>Industry 2.0</td>
<td>Mass production, electricity, Automobile</td>
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<tr>
<td>1969</td>
<td>Industry 3.0</td>
<td>Computers, automation, robotics, Multimodal, intermodal</td>
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<tr>
<td>2000</td>
<td>Industry 4.0</td>
<td>Internet, data analytics, connectivity, ITS, digital infrastructure</td>
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<tr>
<td>Today</td>
<td>Industry 5.0</td>
<td>Human-machine cognition, mass customization, V2X, human-centered transport</td>
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*Source: Cambridge Systematics synthesis of various published studies*
CUSTOMER-CENTERED PLANNING
RISKS

“IDENTIFY THE MOST SEVERE RISKS ON A GLOBAL SCALE OVER THE NEXT 10 YEARS”

1. EXTREME WEATHER EVENTS
2. CRITICAL CHANGE TO EARTH SYSTEMS
3. BIODIVERSITY LOSS/ECOSYSTEM COLLAPSE
4. NATURAL RESOURCE SHORTAGES
5. MISINFORMATION AND DISINFORMATION
6. ADVERSE OUTCOMES OF AI TECHNOLOGIES
7. INVOLUNTARY MIGRATION
8. CYBERSECURITY
9. SOCIAL POLARIZATION
10. POLLUTION

“BLACK BOX” DECISION MAKING

DATA & TECHNOLOGY MANAGEMENT

CYBERSECURITY

ALGORITHM BIAS

MISINFORMATION/DISINFORMATION

ENVIRONMENTAL
TECHNOLOGICAL
SOCIETAL

Source: World Economic Forum, 2024
THE GREATEST RISK... AND GREATEST OPPORTUNITY

“The traditional view is that the humans are the problem. We think we can improve safety or mobility by taking the human out of the equation, and it does not work. We need to think about how we use autonomy to enhance and team with human abilities, not replace them. What we need is human-centered transportation, enabled by technology.”
PREPARING YOUR AGENCY

BECOME TECHNOLOGY-AWARE

DEFINE A TECHNOLOGY-AWARE VISION

IDENTIFY POTENTIAL IMPACTS ON DOT OBJECTIVES

ADAPT ORGANIZATIONAL PERFORMANCE MANAGEMENT PROCESS TO INCORPORATE DISRUPTIVE TECHNOLOGIES

SELECT PRACTICAL PERFORMANCE MANAGEMENT STRATEGIES FOR THE NEAR- AND LONG-TERM

IMPLEMENT AND MANAGE CONTINUOUS CHANGE
LEVERS OF CHANGE

PARTNERSHIPS

COMMUNICATIONS & CUSTOMER SERVICE

LAND USE COORDINATION

MULTI-STATE COORDINATION

POLICIES & REGULATIONS

PLANS & PROGRAMS

ASSETS & RIGHT OF WAY

INVESTMENTS

TECHNOLOGY & DATA

HUMAN RESOURCES

ORGANIZATION & GOVERNANCE

VISION FRAMEWORK
WHAT WILL THE TRANSPORT AGENCY OF THE FUTURE LOOK LIKE?

DEPARTMENT OF SYSTEM MANAGEMENT

DEPARTMENT OF MOBILITY

DEPARTMENT OF STRATEGIC DEVELOPMENT