DEMYSTIFYING AI:
PRACTICAL APPLICATIONS IN PUBLIC WORKS

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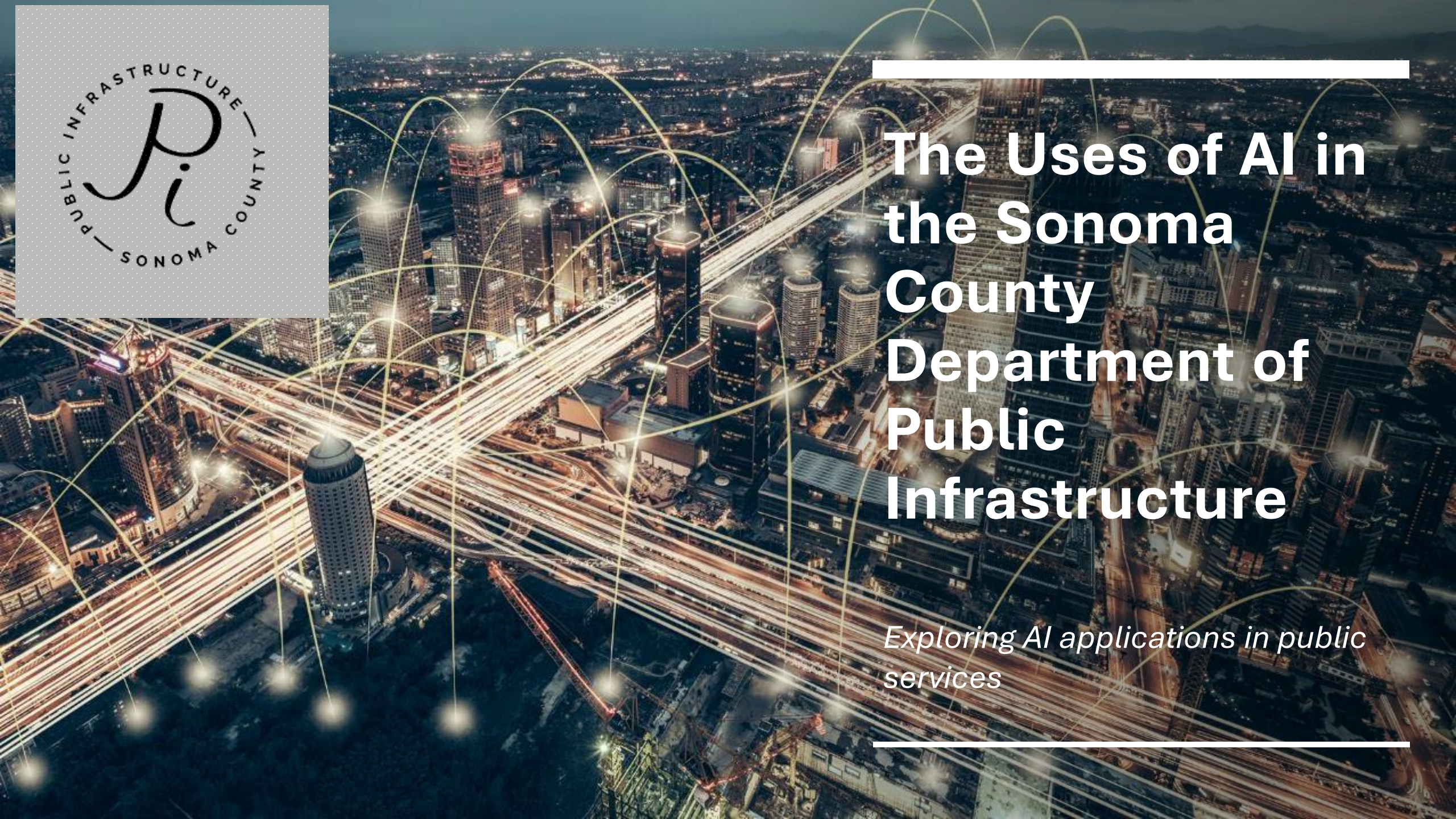
OVERVIEW OF LOCAL GOVERNMENT CHALLENGES

- FINANCIAL LIMITATIONS
- INCREASING DEMAND FOR SERVICES
- WORKFORCE CHALLENGES
- LEGAL AND REGULATORY HURDLES
- MEDIA INFLUENCE AND BIAS
- POLITICAL PRESSURES AND CLIMATE

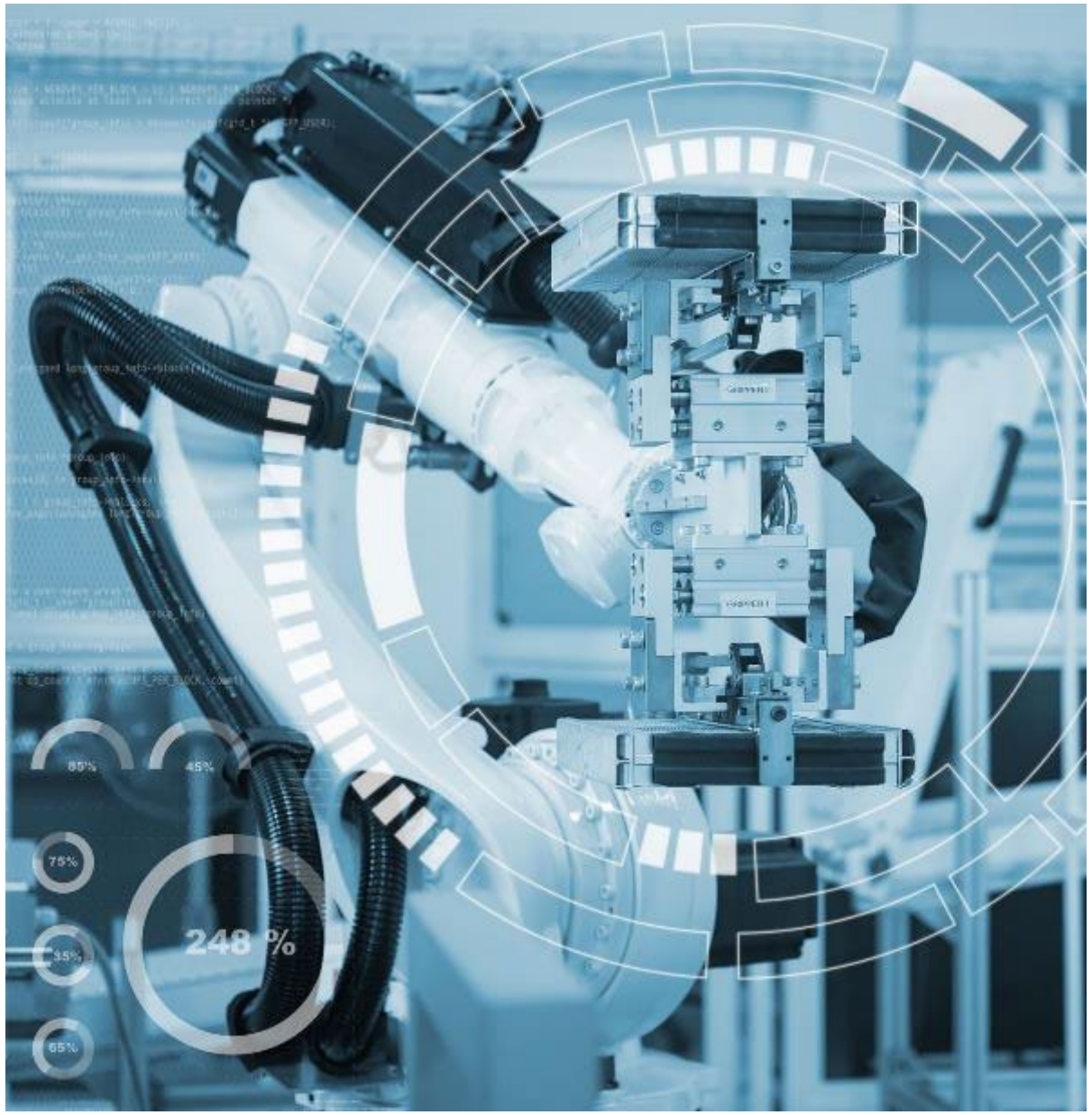
TODAY'S BROADER GOALS

- INTRODUCE AUDIENCE TO AI
- PROVIDE REAL-WORLD EXAMPLES OF AI USE IN LOCAL GOVERNMENT
- ADDRESS CONCERNS INVOLVING AI
- SPUR DISCUSSIONS ON HOW AI CAN HELP IMPROVE YOUR ORGANIZATION'S PERFORMANCE



The Uses of AI in the Sonoma County Department of Public Infrastructure

Exploring AI applications in public services



Agenda for Discussion

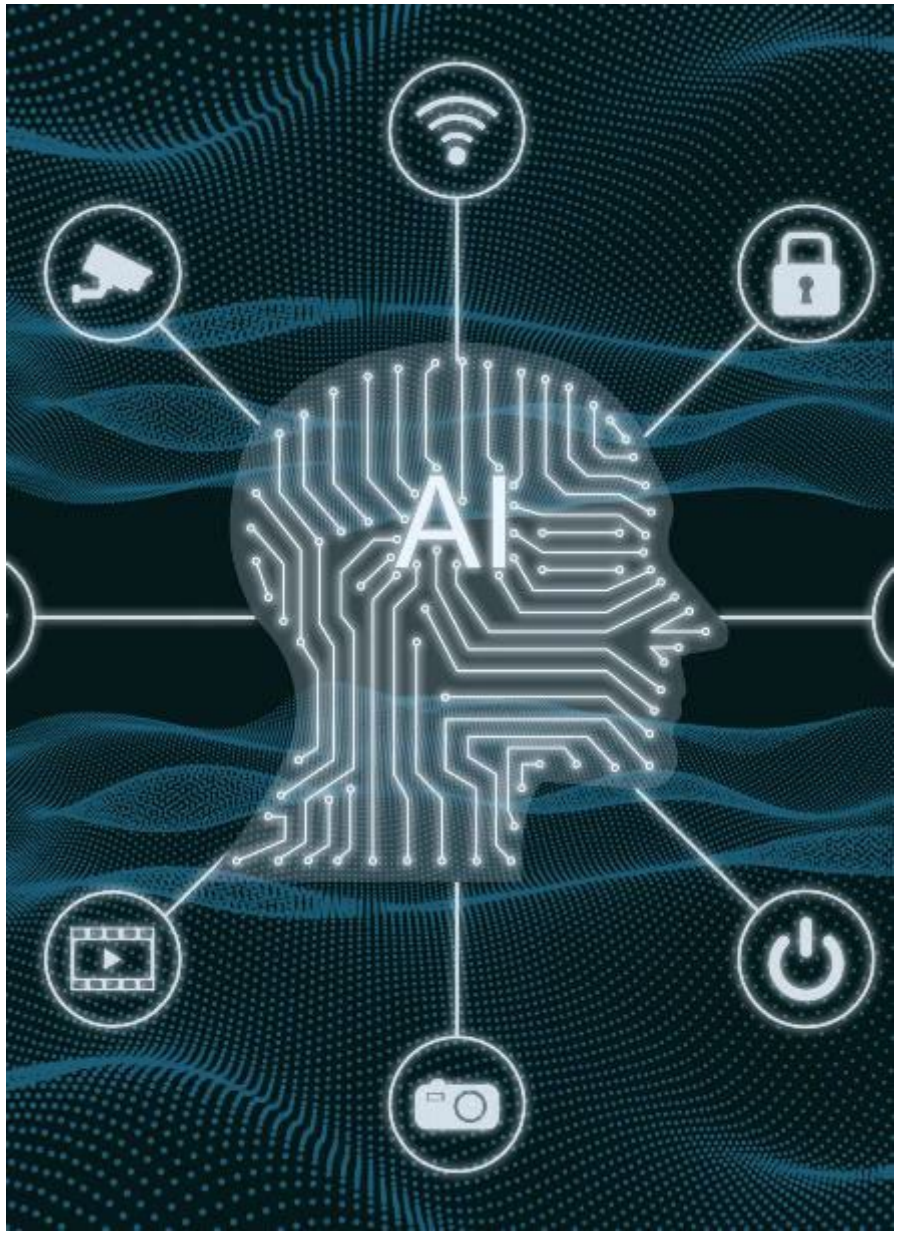
Administrative Uses of AI

Technical Uses of AI

Uses of Cameras and AI in Emergency Management

AI in Transportation and Vegetation Management

Administrative Uses of AI



HR Functions: Onboarding and Training New Employees

Automated Training Schedules

AI can automate training schedules, ensuring that new employees receive necessary training promptly and efficiently.

Personalized Learning Experiences

By utilizing AI, the onboarding process can be tailored to fit individual learning styles and needs, enhancing the overall experience.

Instant Feedback Mechanism

AI provides instant feedback during training, allowing new employees to improve in real-time and feel more confident in their roles.

Community Communications, Especially During Emergencies

AI in Emergency Communication

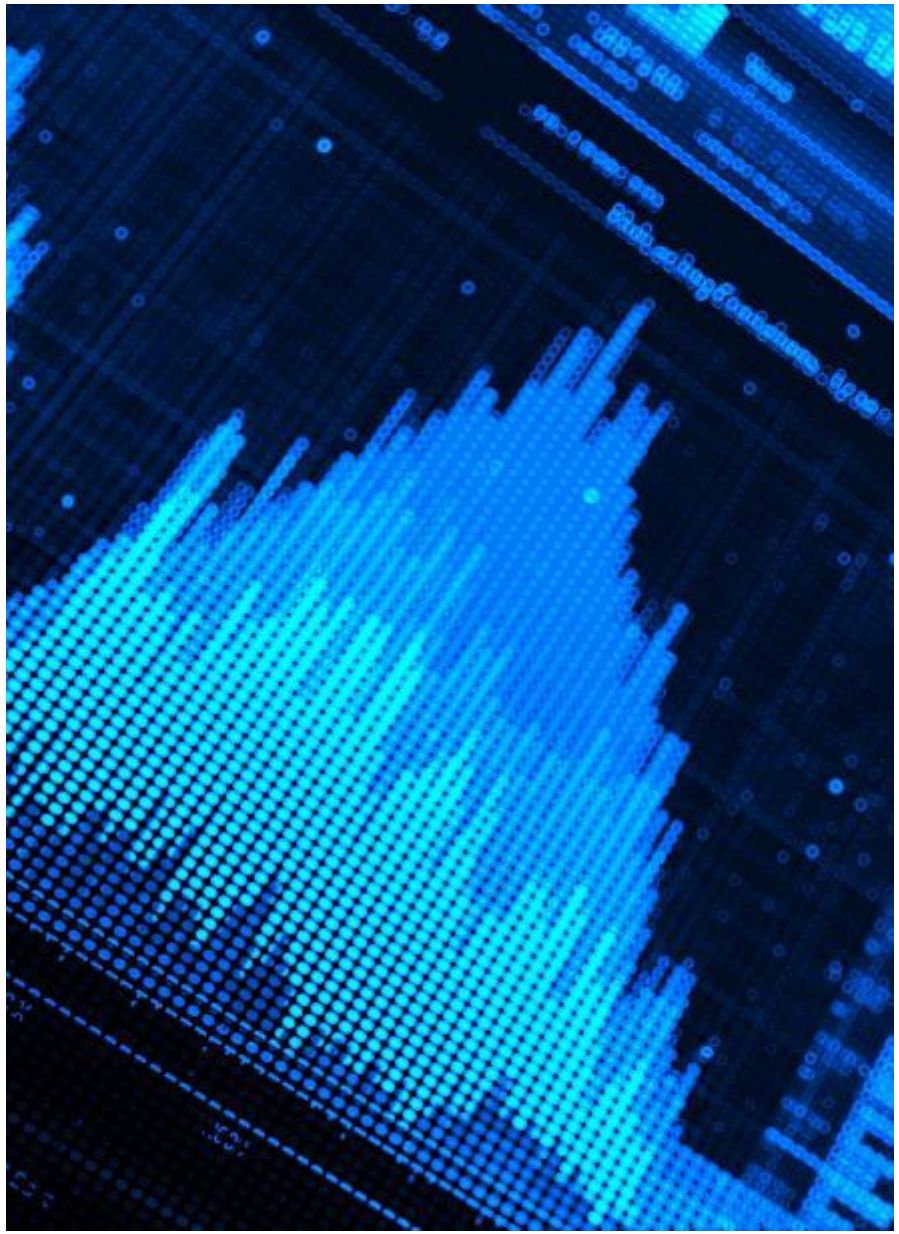
AI tools enhance communication efficiency during emergencies by delivering rapid and accurate information to communities.

Automated Messaging Systems

Automated messaging systems provide real-time updates, ensuring residents receive critical information promptly during emergencies.

Community Safety Awareness

Timely communication through AI fosters community safety awareness, helping residents stay informed and secure during crises.



Analyzing High Volumes of Data

Fast Data Processing

AI algorithms can analyze large datasets swiftly, significantly reducing the time required for data analysis.

Identifying Trends

With advanced analytics, departments can quickly identify trends and patterns within large datasets, aiding in strategic planning.

Data-Driven Decisions

The capability to analyze data effectively leads to informed decision-making based on reliable insights, crucial for management.

Evaluating Agreements and Grant Applications

Automation of Review Process

AI streamlines the review process by automating evaluations, which saves time and reduces human error.

Ensuring Compliance

AI technology ensures that agreements and grant applications comply with required standards and regulations, minimizing risks.

Highlighting Key Metrics

AI tools can highlight key performance metrics and insights, aiding decision-makers in evaluating proposals effectively.

Technical Uses of AI

Preparing Maintenance Schedules for Equipment and Infrastructure Assets

AI in Maintenance Prediction

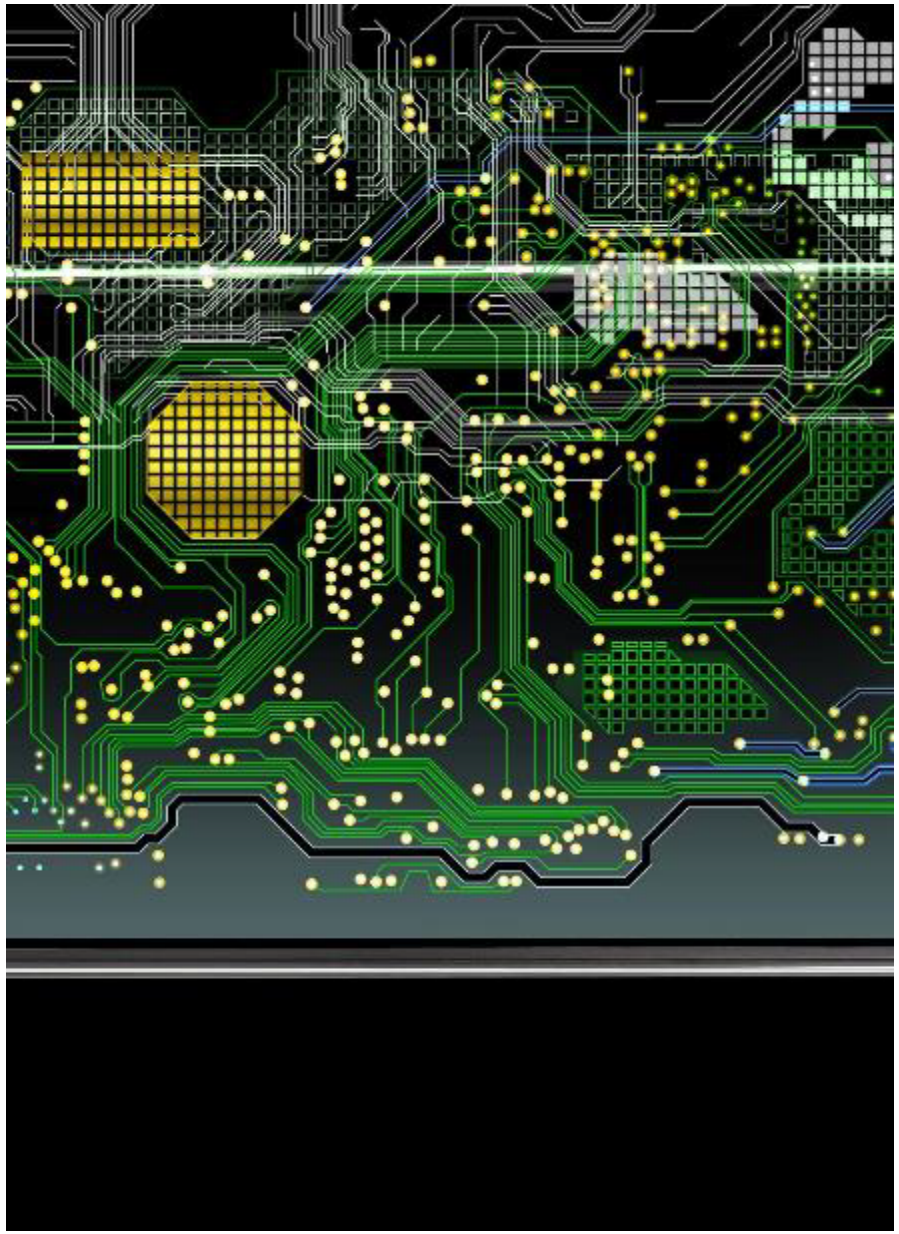
AI technology enables predictive maintenance by analyzing usage patterns and historical data effectively.

Proactive Scheduling Benefits

Proactive scheduling helps in minimizing downtime and ensuring that equipment operates at optimal levels.

Extending Asset Lifespan

By anticipating maintenance needs, organizations can extend the lifespan of their assets and improve efficiency.



Assisting in the Design of Infrastructure

AI Simulation Tools

AI tools enable the simulation of various scenarios for infrastructure projects, improving the planning and design stages.

Optimizing Designs

AI helps optimize designs for safety and efficiency, which leads to enhanced project outcomes and reduced risks.

Enhanced Project Outcomes

Utilizing AI in infrastructure design results in better project outcomes through data-driven decision-making and innovation.

Calculating Capacity in Landfills

AI in Waste Management

AI technologies are being utilized to analyze landfill data, enhancing the efficiency of waste management operations.

Optimizing Capacity

Understanding landfill capacity through data analysis allows for better planning and resource allocation in waste disposal.

Environmental Compliance

AI helps ensure that landfill operations comply with environmental regulations, promoting sustainable waste management practices.

Uses of Cameras and AI in Emergency Management

Early Fire Detection

AI Technology in Fire Detection

AI-enhanced cameras utilize advanced algorithms to analyze visual data for early signs of fire like smoke or heat patterns.

Rapid Response Capabilities

By detecting fires early, these systems enable quicker response times, helping to mitigate the impact of wildfires.

Community Protection

The implementation of AI fire detection systems protects communities and valuable resources from potential wildfires.

Flood Warnings

AI Weather Analysis

AI systems utilize advanced algorithms to analyze weather patterns, providing crucial data for predicting floods.

Early Flood Warnings

The capability to issue early flood warnings allows emergency services to act swiftly and effectively to protect lives and property.

Emergency Preparedness

With accurate flood predictions, emergency services can prepare resources and plans to respond to flood events efficiently.

Enhanced Communication Systems

Data Integration

AI can integrate various data sources to provide comprehensive information during emergencies, improving situational awareness.

Coordination Among Responders

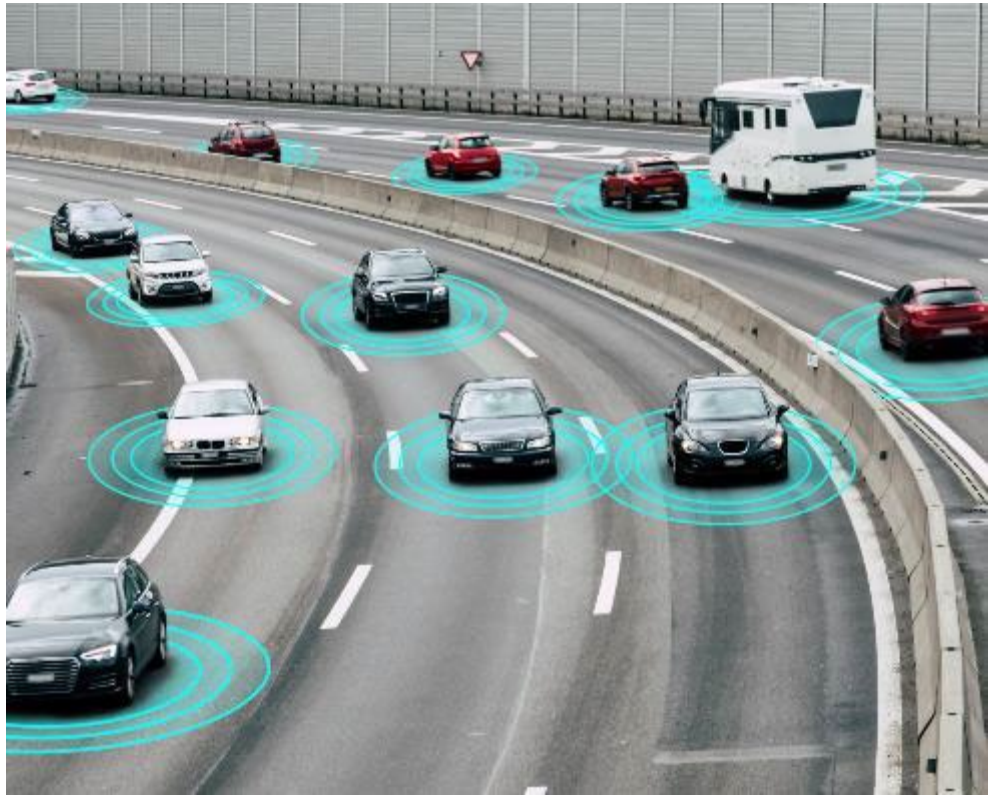
Enhanced communication systems facilitate better coordination among emergency responders, leading to more efficient operations.

Clear Messaging to Public

AI improves the clarity of messaging to the public, ensuring timely and accurate information dissemination during crises.

AI in Transportation

Transportation Signage and Autonomous Vehicles



AI Optimization of Signage

AI technologies are being utilized to optimize transportation signage, ensuring that information is clear and effective for drivers.

Integration with Autonomous Vehicles

The integration of AI with autonomous vehicle systems is enhancing communication between vehicles and signage, improving response times.

Enhancing Road Safety

AI-enhanced signage and autonomous vehicle systems work together to improve overall road safety for all users.

Visual Inspections with Drones

AI Technology in Drones

Drones equipped with AI technology enhance the efficiency and accuracy of visual inspections of various infrastructures especially during disaster recovery.

Infrastructure Maintenance

Visual inspections using drones allow for proactive maintenance, helping to identify potential issues early before they escalate.

Data Collection

Drones provide valuable data during inspections, enabling better decision-making and resource allocation for maintenance tasks.

Conclusion

Enhanced Efficiency

AI integration streamlines processes within the department, allowing for faster decision-making and resource management.

Improved Safety

Implementing AI technologies increases safety measures in public infrastructure, reducing risks and enhancing community well-being.

Effective Communication

AI facilitates better communication between the department and the community, ensuring transparency and responsiveness to needs.

Before & After AI: Enhancing Staff Reports

Andy Ramirez
Assistant City Manager
City of Loma Linda

Before AI

Introduction Example:

'This report is to inform about the ongoing study for adjusting water rates. Various methodologies have been considered, including cost-of-service analysis, but further assessments are still underway. The impact on residential and commercial users is different due to allocation factors. More details will be presented as findings evolve.'

When you need a collaborative team to pull together key information on a Staff Report, who do you call?

Call your AI team

Best Practices

- Start with a Clear Purpose Statement
- Use Simple, Direct Language
- Structure Content Logically (Background, Findings, Recommendations)
- Provide Clear Takeaways & Next Steps
- Be Concise – Avoid Unnecessary Details

AI After:

Introduction Example:

‘This report is to present findings from the recent Water Rate Study and provide a recommendation for the City Council to consider. The study analyzed the cost of services, including operations and maintenance of the water wells, booster pump stations, treatment, power, capital projects, delivery of imported water, adherence to increasing State compliance programs, and a proposed salary survey update to remain competitive with water districts.

Key findings indicate the need for a 7% rate adjustment to provide clean drinking water delivery and a sustainable infrastructure. If approved, the proposed rate structure will be effective July 1, 2025.'

Key commands

- Explain the importance of a water rate study
- Be concise and improve the grammar
- Make a compelling statement

Thank you

Andy Ramirez, Assistant City Manager

City of Loma Linda

951.515.0021

The Future of Public Works

Ian J. Timmons, MSc AAI

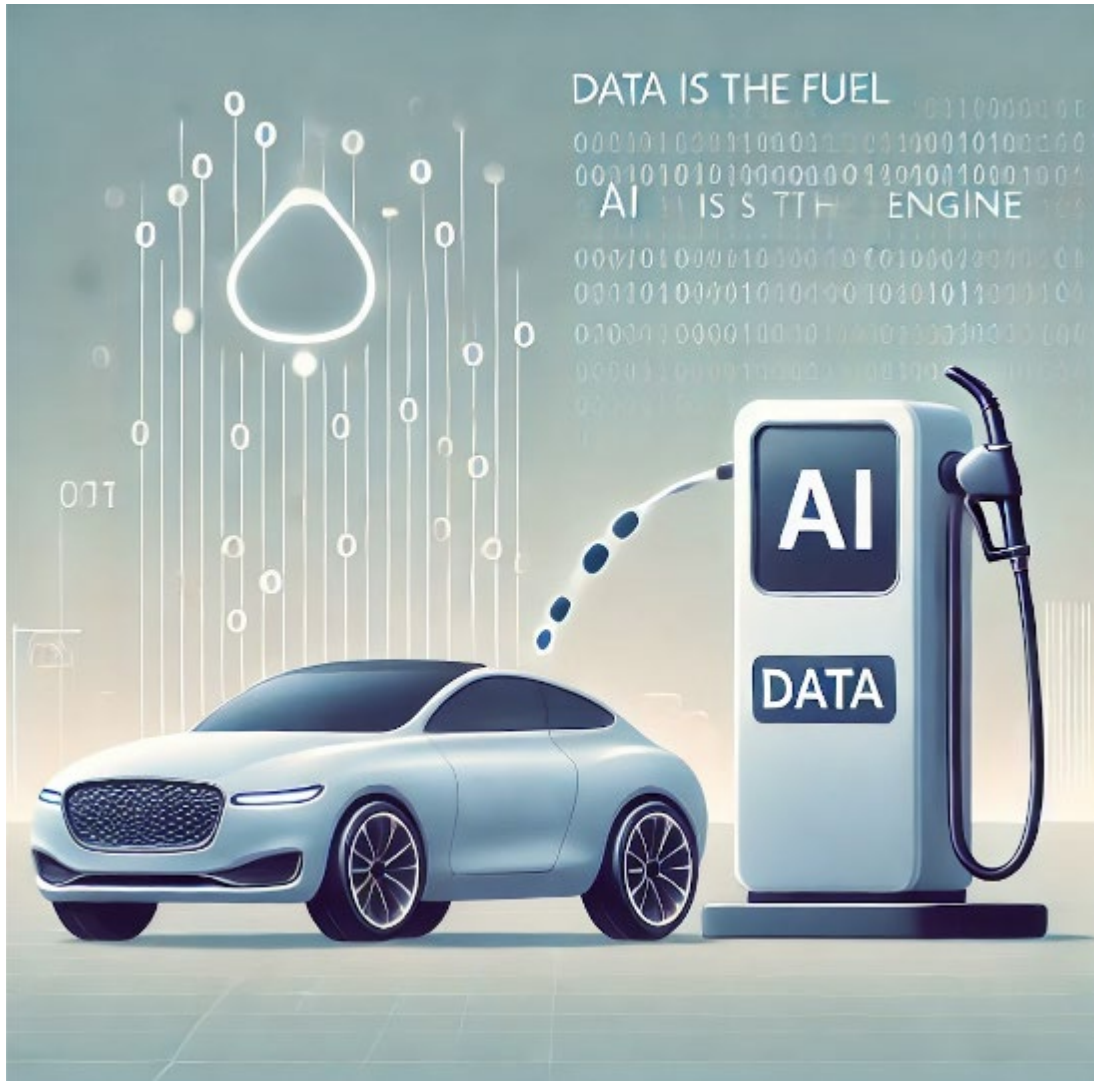
What is AI?

What is AI Exactly?

- **Machine Learning (ML):** Algorithms that learn from and make predictions on data.
- **Natural Language Processing (NLP): Natural Language Processing.**
- **Computer Vision (CV): Understanding of image/video recognition.**
- **Evolutionary/Genetic Algorithms (EA/GA):** Natural selection based concepts to solve optimization

Data is the Fuel. AI is the Engine

- No fuel, no movement. No data, no AI.
- Bad fuel = Poor performance. Bad data = Bad AI decisions.
- High-quality fuel = Optimal performance. Clean, structured data makes AI smarter.
- A full tank gets you further. More data = More accurate AI insights.
- Regular maintenance is key. Data must be updated, cleaned, and shared.



OurGOV

Silos Silos Silos!

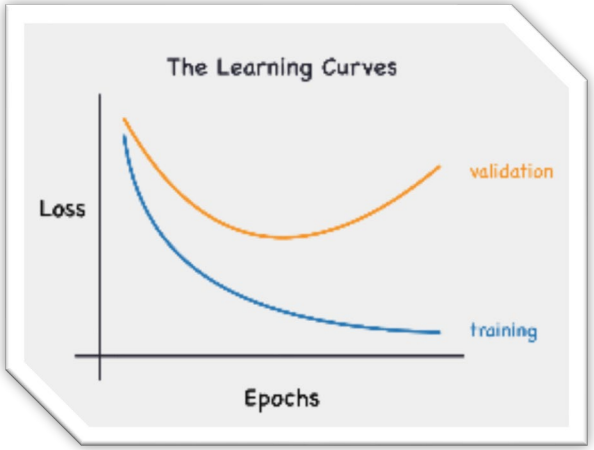
- Data hoarded, not shared
- Departments working in isolation
- Decisions made with incomplete information
- One agency's failure = Everyone's problem
- Incomplete Data
- Infrastructure suffers when collaboration fails
- Inconsistent Data
- AI needs data, but data is locked away

OurGOV

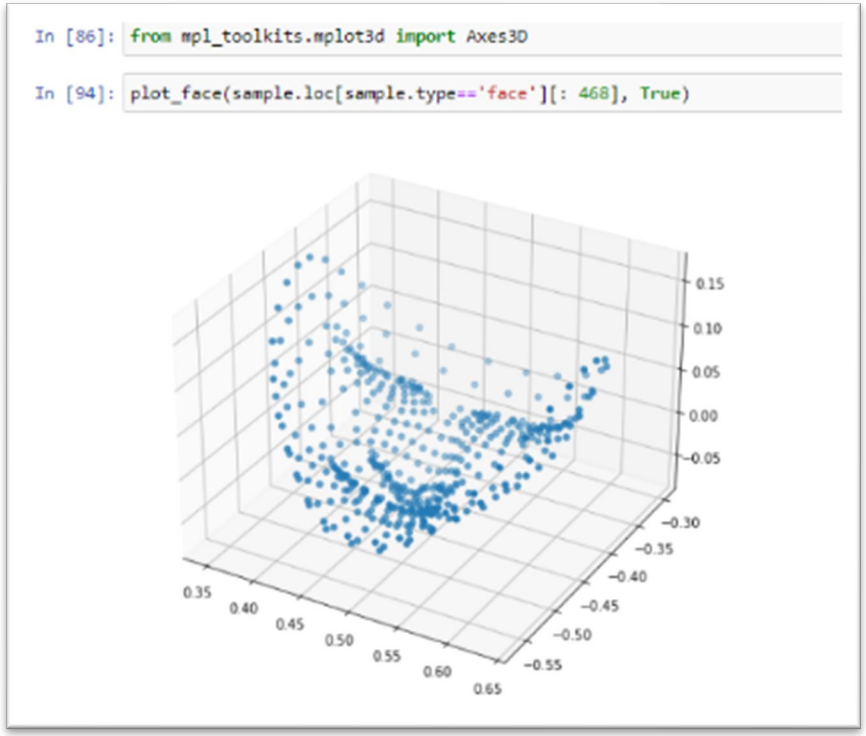
Show me the data!

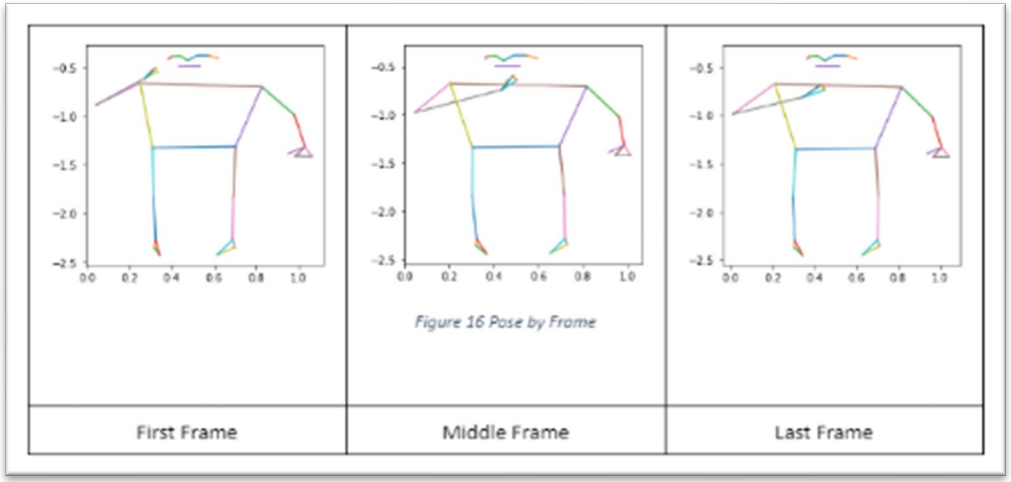
- What is bad data?

- Inaccurate Data
- Biased Data
- Outdated Data
- Incomplete Data
- Noisy Data
- Inconsistent Data
- Misleading Data
- Non-representative Samples



- Accurate Data
- Comprehensive
- Up-to-Date
- Balanced
- Consistent
- Clean
- Diverse
- Ethical





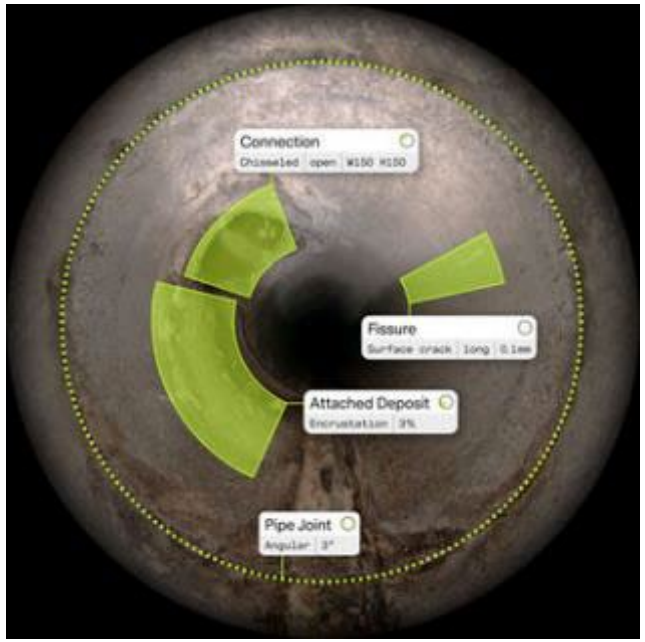
OurGOV

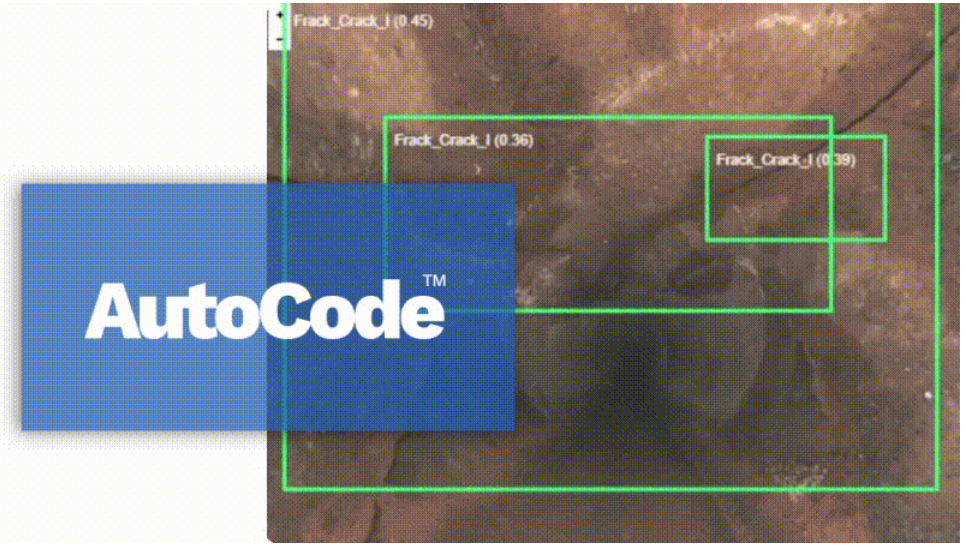
AI in Public Works

- Smart Sewer Systems: IoT Sensors Feeding Data to Larger Ecosystems
- Pothole Detection
- CCTV Integration
- Underground Mapping

Non-Specific

- Generative AI SOPs
- Sending Emails
- ChatBots
- Imagery





OurGOV

Emerging Technology

What technology is on the way?

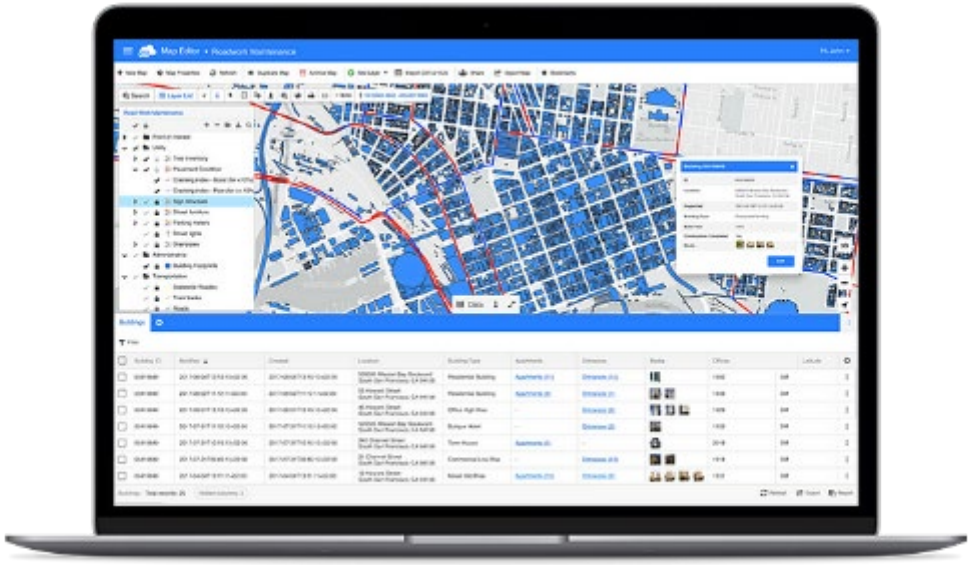
- **Augmented Reality (Oculus, Quest, Etc..)**
- **Interactive Assets Technology**

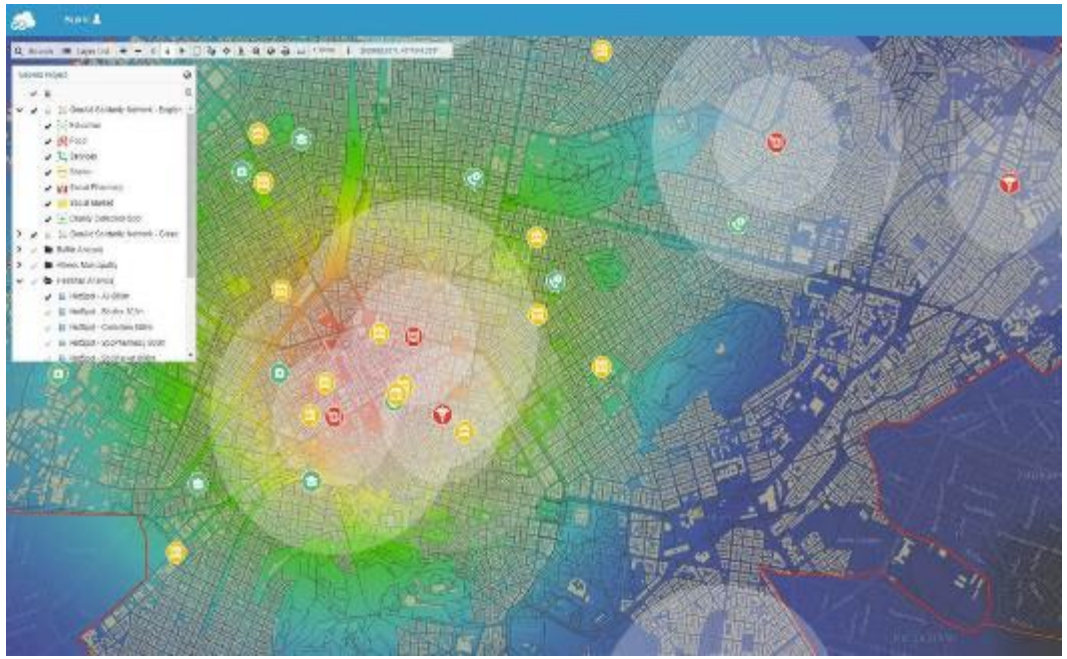
OurGOV

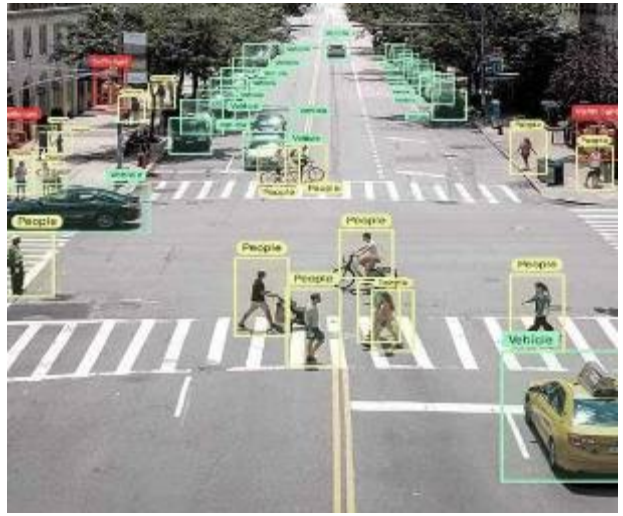
Emerging Technology – Cont..

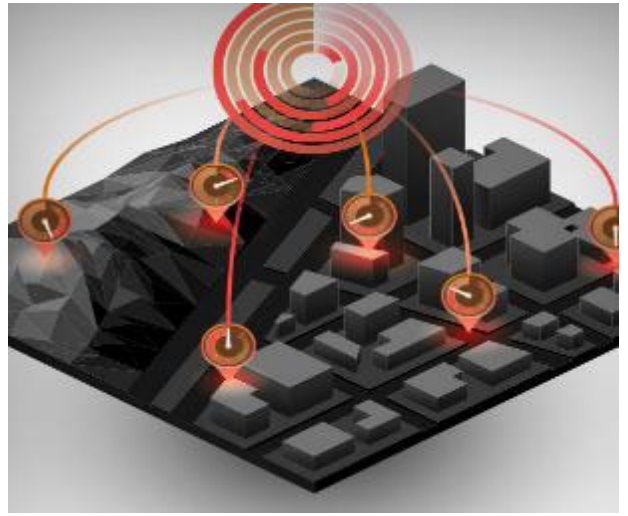
What technology is on the way?

- **Topographical Assessments**
- **GIS & Infrastructure CIP Insights**





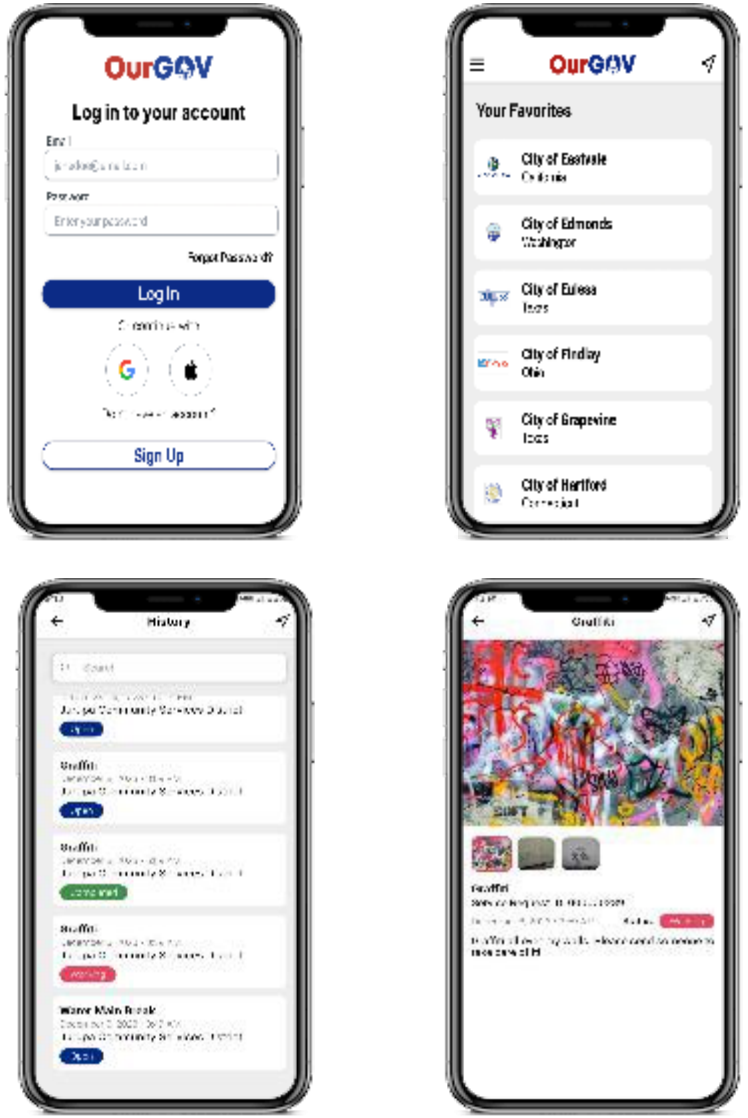




OurGOV

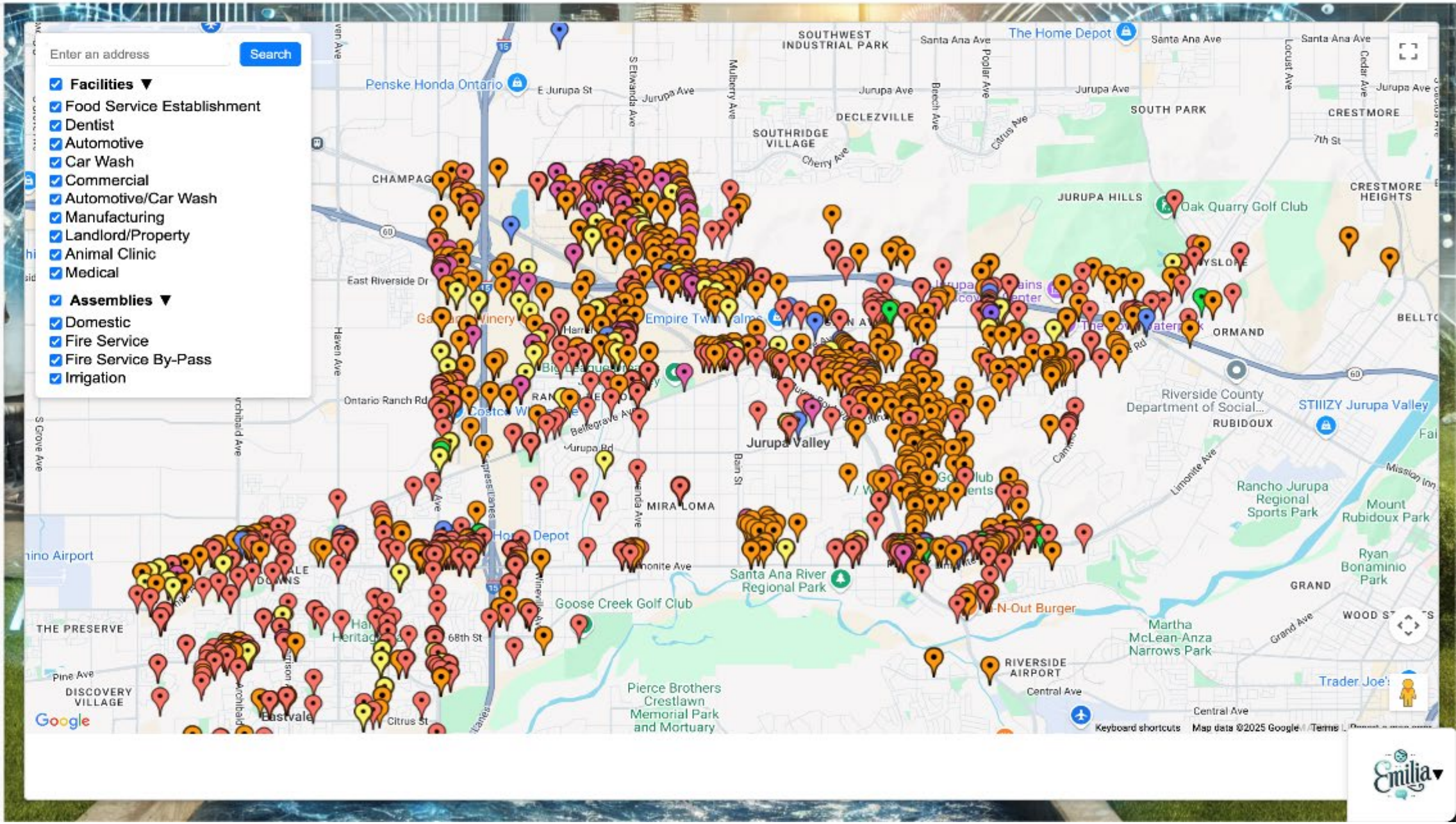
What we are doing.

✅ Building the hub of government data.
✅ Work order systems accessible to everyone, everywhere.
✅ Deriving insights across the country.
✅ Deploying AI models for all government agencies to use.
✅ Breaking down data silos to improve decision-making.
✅ Creating a nationwide standardized data structure.
✅ Enhancing public works efficiency through predictive AI.
✅ Developing compliance and asset management tools tailored for local governments.
✅ Providing open-access tools to small and mid-sized agencies.
✅ Empowering agencies with automation, AI-driven insights, and real-time analytics.

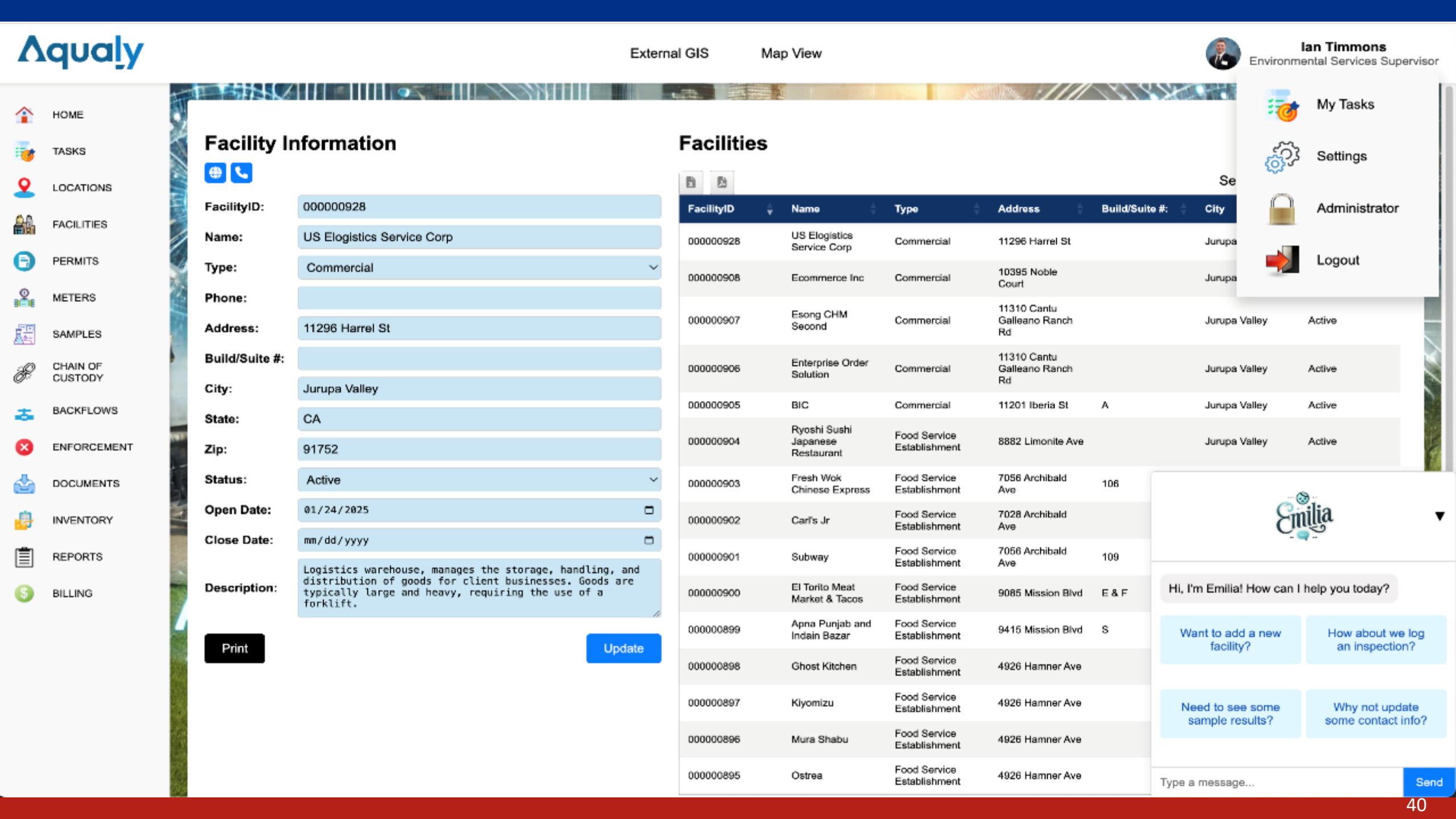


OurGOV

HOME
TASKS
LOCATIONS
FACILITIES
PERMITS
METERS
SAMPLES
CHAIN OF CUSTODY
BACKFLOWS
ENFORCEMENT
DOCUMENTS
INVENTORY
REPORTS
BILLING



Emilia


Aqualy
External GIS
Map View
Ian Timmons
Environmental Services Supervisor
My Tasks
Settings
Administrator
Logout
HOME
TASKS
LOCATIONS
FACILITIES
PERMITS
METERS
SAMPLES
CHAIN OF CUSTODY
BACKFLOWS
ENFORCEMENT
DOCUMENTS
INVENTORY
REPORTS
BILLING
Facility Information
FacilityID: 000000928
Name: US Elogistics Service Corp
Type: Commercial
Phone:
Address: 11296 Harrel St
Build/Suite #:
City: Jurupa Valley
State: CA
Zip: 91752
Status: Active
Open Date: 01/24/2025
Close Date: mm/dd/yyyy
Description: Logistics warehouse, manages the storage, handling, and distribution of goods for client businesses. Goods are typically large and heavy, requiring the use of a forklift.
Print
Update
Facilities
FacilityID
Name
Type
Address
Build/Suite #:
City
000000928 US Elogistics Service Corp Commercial 11296 Harrel St Jurupa
000000908 Ecommerce Inc Commercial 10395 Noble Court Jurupa
000000907 Esong CHM Second Commercial 11310 Cantu Galleano Ranch Rd Jurupa Valley Active
000000906 Enterprise Order Solution Commercial 11310 Cantu Galleano Ranch Rd Jurupa Valley Active
000000905 BIC Commercial 11201 Iberia St A Jurupa Valley Active
000000904 Ryoshi Sushi Japanese Restaurant Food Service Establishment 8882 Limonite Ave Jurupa Valley Active
000000903 Fresh Wok Chinese Express Food Service Establishment 7056 Archibald Ave 106
000000902 Carl's Jr Food Service Establishment 7028 Archibald Ave
000000901 Subway Food Service Establishment 7056 Archibald Ave 109
000000900 El Torito Meat Market & Tacos Food Service Establishment 9085 Mission Blvd E & F
000000899 Apna Punjab and Indain Bazar Food Service Establishment 9415 Mission Blvd S
000000898 Ghost Kitchen Food Service Establishment 4926 Hamner Ave
000000897 Kiyomizu Food Service Establishment 4926 Hamner Ave
000000896 Mura Shabu Food Service Establishment 4926 Hamner Ave
000000895 Ostrea Food Service Establishment 4926 Hamner Ave
Emilia
Hi, I'm Emilia! How can I help you today?
Want to add a new facility?
How about we log an inspection?
Need to see some sample results?
Why not update some contact info?
Type a message...
Send

OurGOV

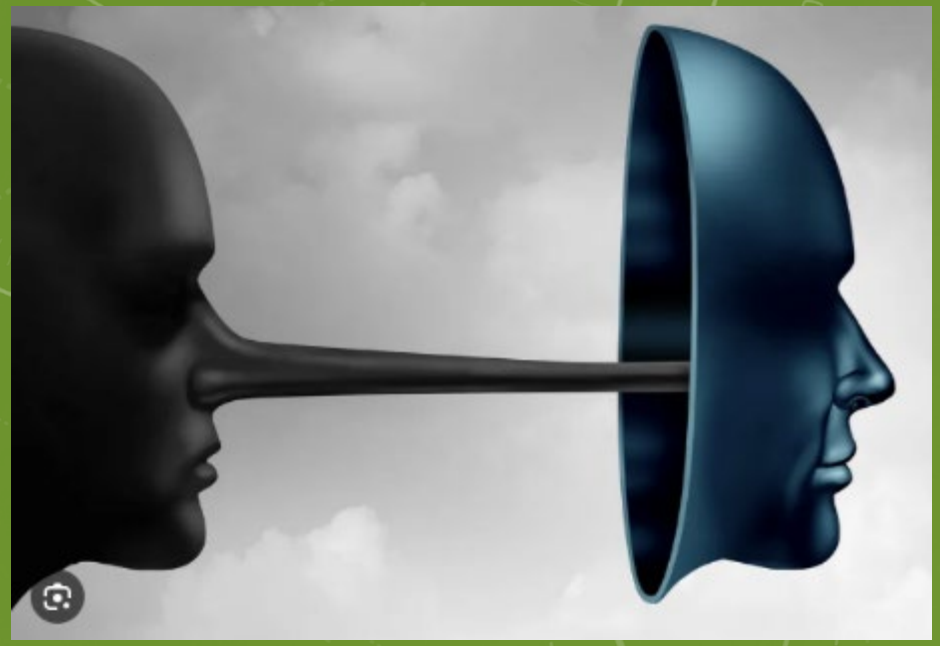
EXAMPLES

- CRAFTING MESSAGES TO ELECTED LEADERS
  - “Review my message’s tone, tenor, and clarity”
- ASSISTING WITH MESSAGING DURING EMERGENCY EVENTS
- SUMMARIZING TECHNICAL DATA
- PREPARE BIDDING DOCUMENTS
- PROGRESSIVE DISCIPLINE PROCESS

OTHER EXAMPLES

- PUBLIC RECORDS ACT REQUESTS
- RESPOND TO RESIDENT EMAILS
- PREPARE SOCIAL MEDIA CONTENT
- POLICY CREATION
- EMPLOYEE ENGAGEMENT AND OUTREACH EFFORTS
- EMPLOYEE PERFORMANCE, INCLUDING EVALUATIONS
- ASSISTING WITH RECRUITMENT EFFORTS

AI HALLUCINATIONS AND LIMITATIONS

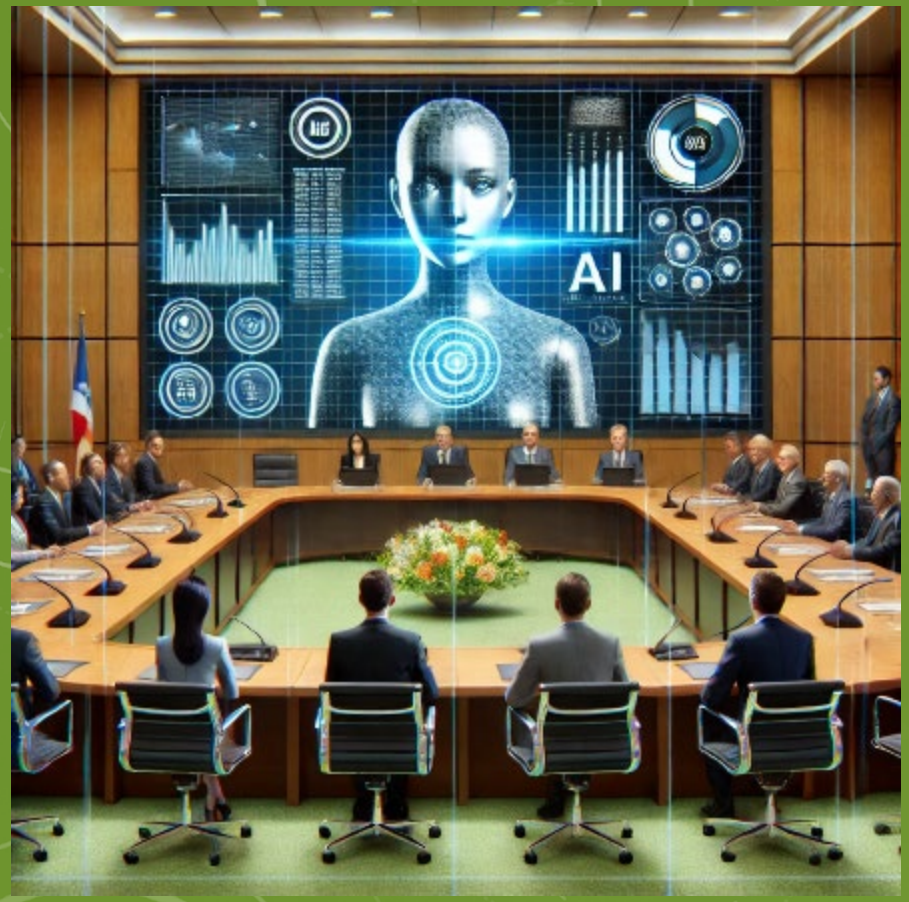


- AI IDENTIFIES PATTERNS IN VAST AMOUNTS OF DATA
- DOES NOT POSSESS GENUINE UNDERSTANDING OR REASONING ABILITIES
- CAN PROVIDE OUTPUTS THAT SEEM PLAUSIBLE BUT ARE FACTUALLY INCORRECT
- *WHAT CAUSES HALLUCINATIONS?*
  - *Insufficient or biased data*
  - *Limited data or model understanding*
  - *Untrained or poorly formed queries*
  - *Insufficient context in a query*
  - *Implied query bias*

HOW TO ADDRESS AI HALLUCINATIONS

- PRIORITIZE HIGH-QUALITY, DIVERSE DATA
- ROBUST FACT-CHECKING AND VALIDATION
- DIVERSITY YOUR SOURCES
- CRITICALLY EVALUATE AI OUTPUTS
- ADOPT AI POLICIES THAT:
  - Establish Ethical and Governance Guidelines
  - Demand Transparency and Explainability for AI Vendors
  - Implements AI Training Programs for Employees
  - Embraces AI’s Opportunities and Challenges

SUMMARY



- INCREDIBLE TOOL IN THE RIGHT CONTEXT
- NOT A UNIVERSAL SOLUTION
- DON’T BE AFRAID TO START SMALL (LOW RISK)
- DISCUSS WITH YOUR EXECUTIVE LEADERSHIP ABOUT CONCERNS OR ISSUES
- BE SKEPTICAL!

Q&A

“BE CURIOUS, NOT JUDGMENTAL” (TED LASSO)