TD SYNNEX | Public Sector

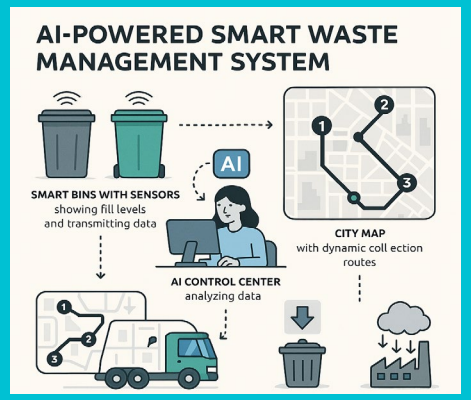
Smart Infrastructure: The Role of AI in Public Works, Transportation, and Utilities

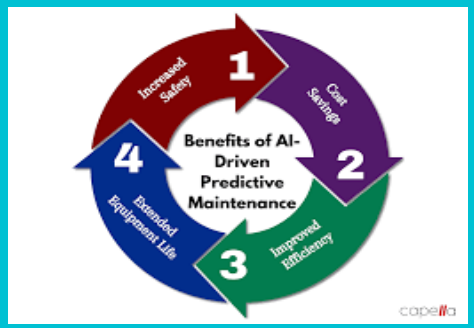
This presentation explores how artificial intelligence is revolutionizing public infrastructure by enhancing efficiency, safety, and sustainability across public works, transportation, and utility systems.

G. Wayne Owens

Public Works Program Manager

Subject Matter Expert
Former Public Works Deputy Director





AI in Public Works

Offering Significant Potential to Revolutionize Public Works

Artificial intelligence (AI) is transforming public works departments, offering a variety of benefits and applications to improve efficiency, cost savings, and service delivery.

Use Cases

- Infrastructure Management-**Aging water pipeline network**
- Traffic Management-**AI-based adaptive traffic signal system**
- Waste Management-**AI-powered smart waste management system**
- Citizen Services-**AI-powered virtual assistant**
- Emergency Response and Disaster Management-**AI-driven flood prediction and response system**

Benefits of using AI in Public Works:

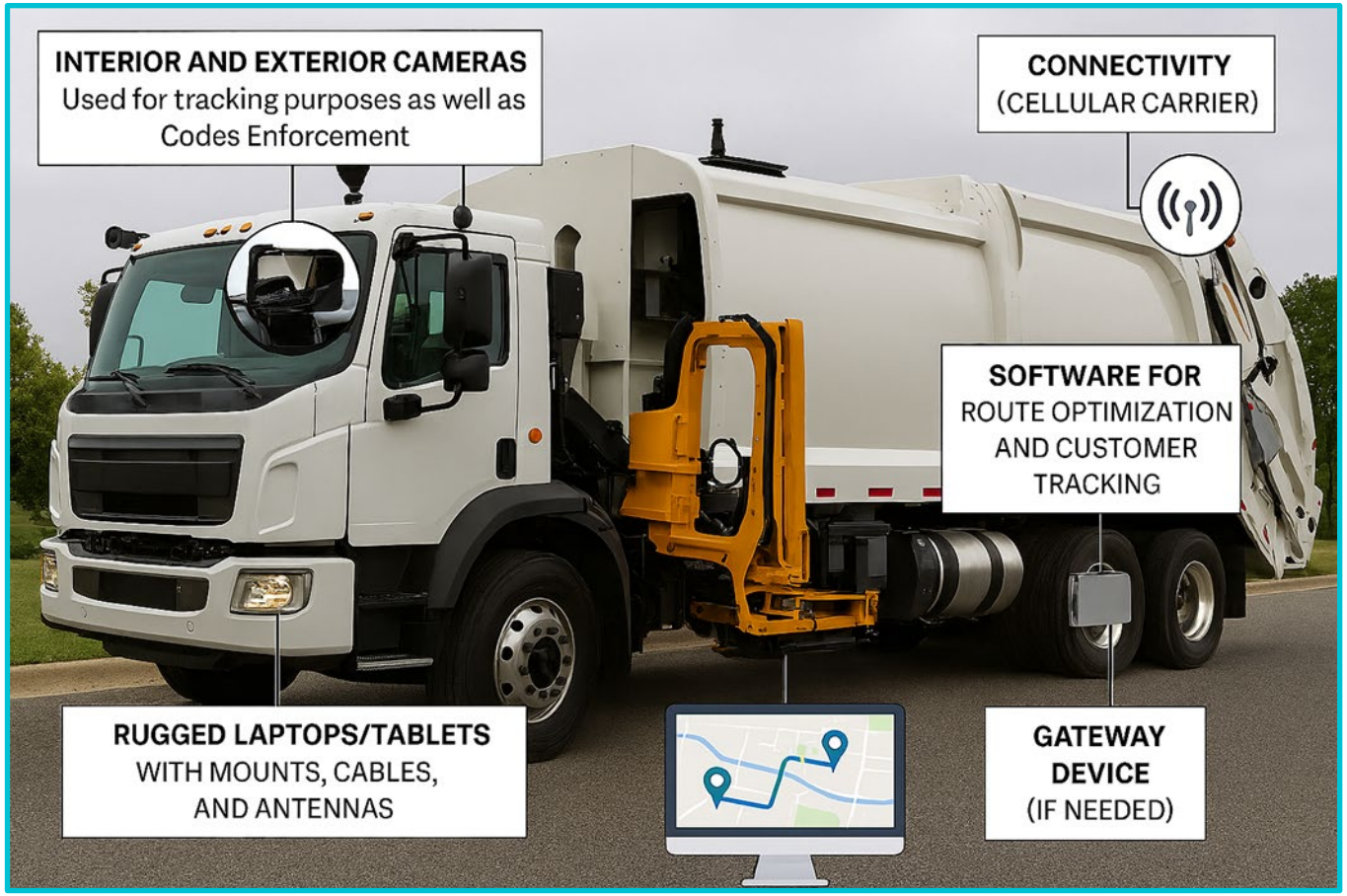
- Increased efficiency and productivity: AI automates routine tasks, freeing up staff for more complex work.
- Cost savings: Predictive maintenance, optimized operations, and streamlined processes lead to cost reductions.
- Improved service quality: AI helps prevent infrastructure failures, improves responsiveness, and enhances community engagement.
- Enhanced safety: Predictive maintenance and improved traffic management can lead to a safer environment.
- Data-driven decision-making: AI analyzes data to provide insights that inform decisions and planning.

AI in Public Works: Use Cases & Vendor Mapping

Use Cases	Vendors
Infrastructure Management (Aging Water Pipeline)	IBM, Microsoft, Oracle, Cisco
Traffic Management (Adaptive Traffic Signals)	Cisco, Intel, NVIDIA
Waste Management (Smart Waste System)	IBM, Microsoft, Google
Citizen Services (Virtual Assistant)	Microsoft, Google, Amazon
Emergency Response (Flood Prediction)	IBM, Microsoft, Oracle
Cybersecurity & IoT Support	Palo Alto, Foritnet, CrowdStrike, Check Point, Sophos

Example of Public Works Full Solutions

- Interior and exterior cameras – used for tracking purposes as well as Codes Enforcement
- Rugged laptops/tablet with mounts, cables, and antennas
- Software for route optimization and customer tracking
- Connectivity (cellular carrier)
- Gateway device (if needed)



Public Works Solution Components & Vendors

Component	Vendors
Cameras	Axis Communications, Hanwah Vision, Bosch, Lorex
Rugged Laptops/Tablets	Getac, Panasonic, Dell, Lenovo, Durabook
Mounts	RAM Mounts, Havis, Gamber-Johnson
Cables	C2G (Cables To Go), Belkin, Tripp Lite
Software	Microsoft, Oracle, SAP, Google, Routeware (onboarding now)
Connectivity	AT&T, Verizon, T-Mobile
Gateway Device	Ericsson, Digi, Teltonika Networks

AI Transforming Public Transportation

Enhancing Efficiency, Safety, and Rider Experience

AI-powered systems are optimizing routes, predicting maintenance needs, and improving real-time information delivery. Examples include smart dispatch for paratransit, predictive maintenance for vehicles, and AI-driven traffic management.

Use Cases

- Smart Dispatch-**AI-driven dynamic dispatch system/real-time demand prediction, traffic data, and vehicle availability**
- Real-time Monitoring-**AI-powered real-time monitoring system**
- Intelligent Ticketing-**AI-powered intelligent ticketing system**
- Autonomous Vehicles-**Autonomous electric shuttles for last-mile connectivity and low-demand routes**

How AI is improving Public Transit:

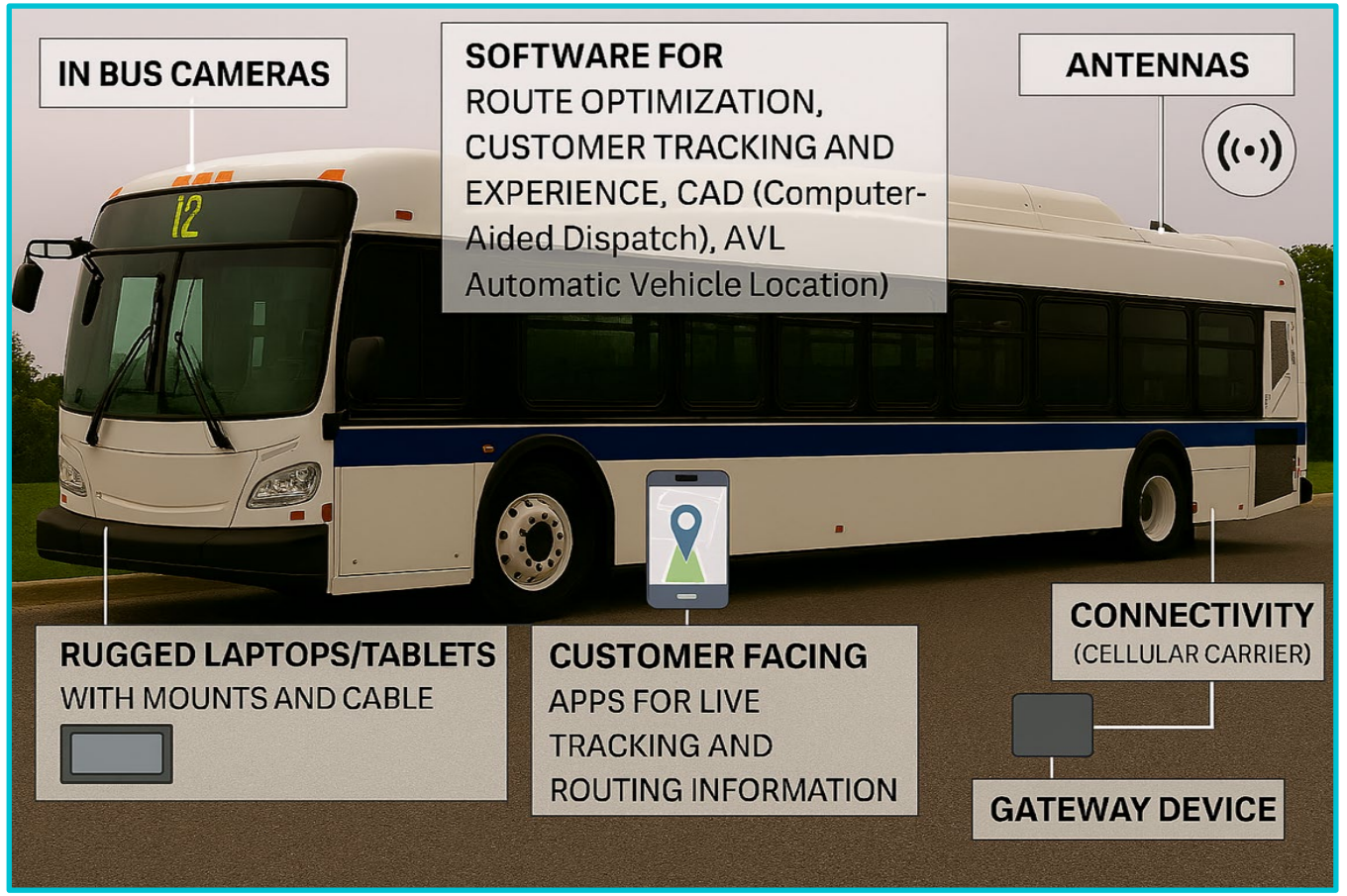
- Operational Efficiency: AI optimizes routes, scheduling, and fleet management, leading to cost savings and better service.
- Predictive Maintenance: AI forecasts potential mechanical issues, enabling proactive maintenance and reducing downtime.
- Safety: AI-powered systems monitor vehicle performance, detect obstacles, and enhance security through surveillance.
- Rider Experience: AI improves real-time information, journey planning, and accessibility features like smart dispatch.
- Environmental Impact: AI can optimize energy consumption in electric vehicles, contributing to a more sustainable system.

Transportation Industry-AI Solutions & Vendor Mapping

AI Use Case	Vendors
Smart Dispatch	• Microsoft-Azure AI for dynamic dispatch • Google-AI for traffic data routing • Oracle-Fleet and logistics optimization
Real-time Monitoring	• Cisco-IoT and network monitoring • IBM-Predictive analytics and real-time data platforms • Ericcson-Connectivity for real-time vehicle monitoring
Intelligent Ticketing	• SAP-Intelligent ticketing and ERP integration • Microsoft-AI powered customer engagement tools • Oracle-Ticketing and payment systems
Autonomous Vehicles	• NVIDIA-AI platforms for autonomous driving • Intel-Edge computing for vehicle autonomy • Bosch-Sensors and AI for autonomous systems

Example of Public Works Full Solutions

- In bus cameras
- Rugged laptops/tablets with mounts and cables
- Software for route optimization, customer tracking and experience, CAD (Computer-Aided Dispatch), AVL (Automatic Vehicle Location)
- Customer facing apps for live tracking and routing information
- Antennas
- Connectivity (cellular carrier)
- Gateway device

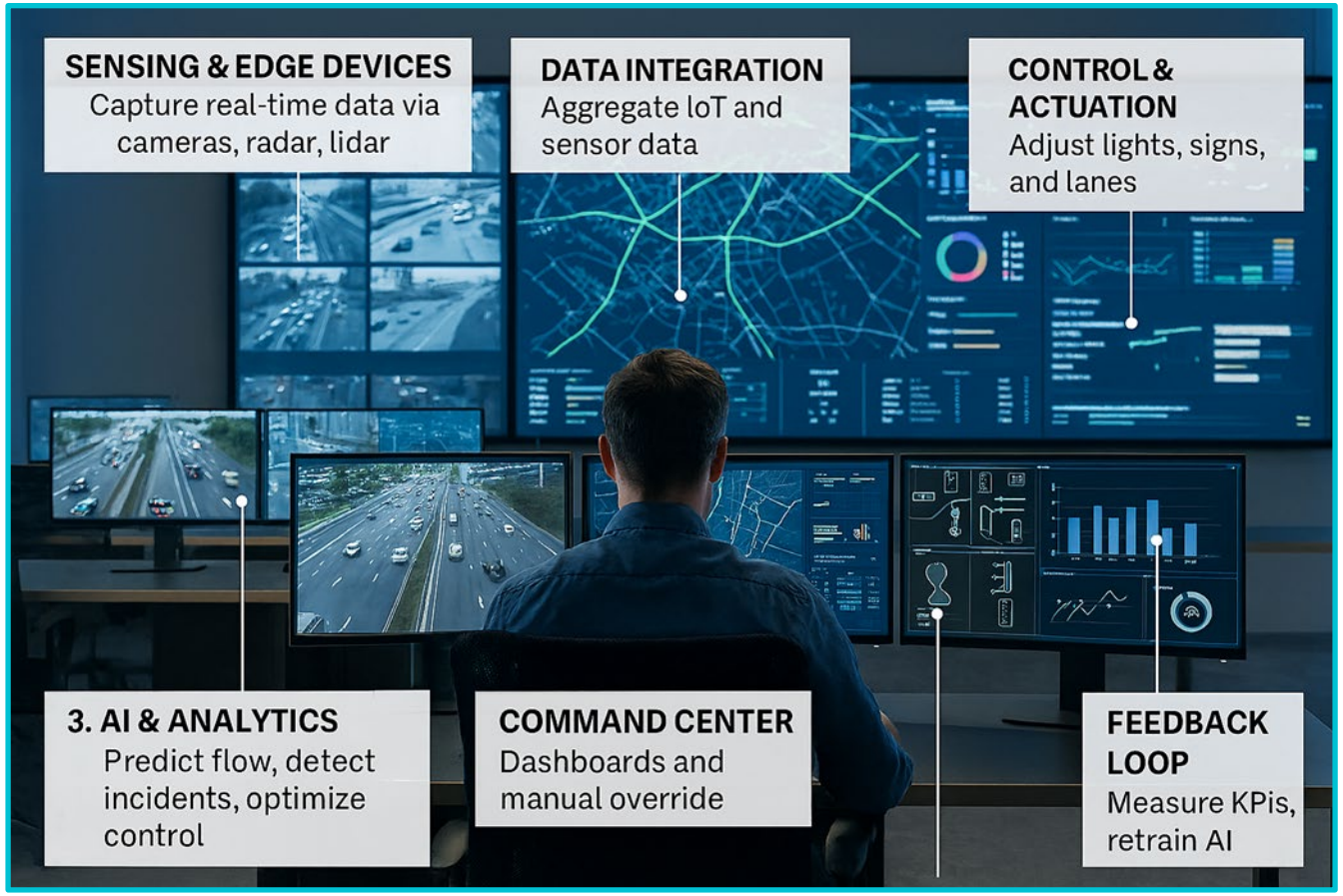


Transportation Full Solution – Vendor Mapping

Component	Vendor
In-Bus Cameras	Axis Communications, Hanwah Vision, Bosch, Lorex
Rugged Laptops/Tablets	Getac, Panasonic, Dell, Lenovo, Durabook
Mounts	RAM Mounts, Havis, Gamber-Johnson
Cables	C2G (Cables To Go), Belkin, Tripp Lite
Software	Microsoft, Oracle, SAP, Google, Routeware (onboarding now)
Customer-Facing Apps	Microsoft, Google, SAP
Antennas	Panorama Antennas, Mobile Mark, Laird Connectivity
Connectivity	AT&T, Verizon, T-Mobile

Example of an AI-Driven Smart Traffic Control Center

- Sensing & Edge Devices – Capture real-time data via cameras, radar, lidar.
- Data Integration – Aggregate IoT and sensor data.
- AI & Analytics – Predict flow, detect incidents, optimize control.
- Control & Actuation – Adjust lights, signs, and lanes.
- Command Center – Dashboards and manual override.
- Feedback Loop – Measure KPIs, retrain AI.



AI-Driven Smart Traffic Control Center – Vendor Mapping

Component	Vendors
Sensing & Edge Devices	Axis Communications, Bosch, Hanwha Vision, Intel
Data Integration	Cisco, IBM, Microsoft, Oracle
AI & Analytics	NVIDIA, Microsoft, Google, IBM
Control & Actuation	Siemens, Cisco, Bosch
Command Center	Dell, Lenovo, Microsoft
Feedback Loop	IBM, Microsoft, Google

AI in Public Utilities

Risk Management and Portfolio Optimization

AI is transforming public utilities by enhancing operational efficiency, improving customer service, and optimizing resource management. AI-powered solutions are being used for predictive maintenance, demand forecasting, grid optimization, and even customer service interactions

Use Cases

- Predictive Maintenance and Asset Management-**AI-powered asset management system using sensor data, etc.**
- Demand Forecasting and Load Management-**AI-based forecasting system that uses machine learning**
- Grid optimization and Stability-**AI-powered grid management platform using real-time data, predictive analytics, etc.**
- Customer Service and Engagement-**AI-powered virtual assistant**
- Detecting/Preventing Fraud/Cyberattacks-**AI-powered cybersecurity and fraud detection system**
- Assisting in Regulatory Compliance/Reporting (Streamlining Administrative Processes)-**AI-powered compliance/reporting system**
- Helping Utilities locate optimal sites for renewable energy projects and optimizing plant performance-**AI-powered geospatial analysis and performance optimization platforms**

Poised to Revolutionize the way Utilities Operate and Serve their Customers

AI in Public Utilities – Vendor Mapping

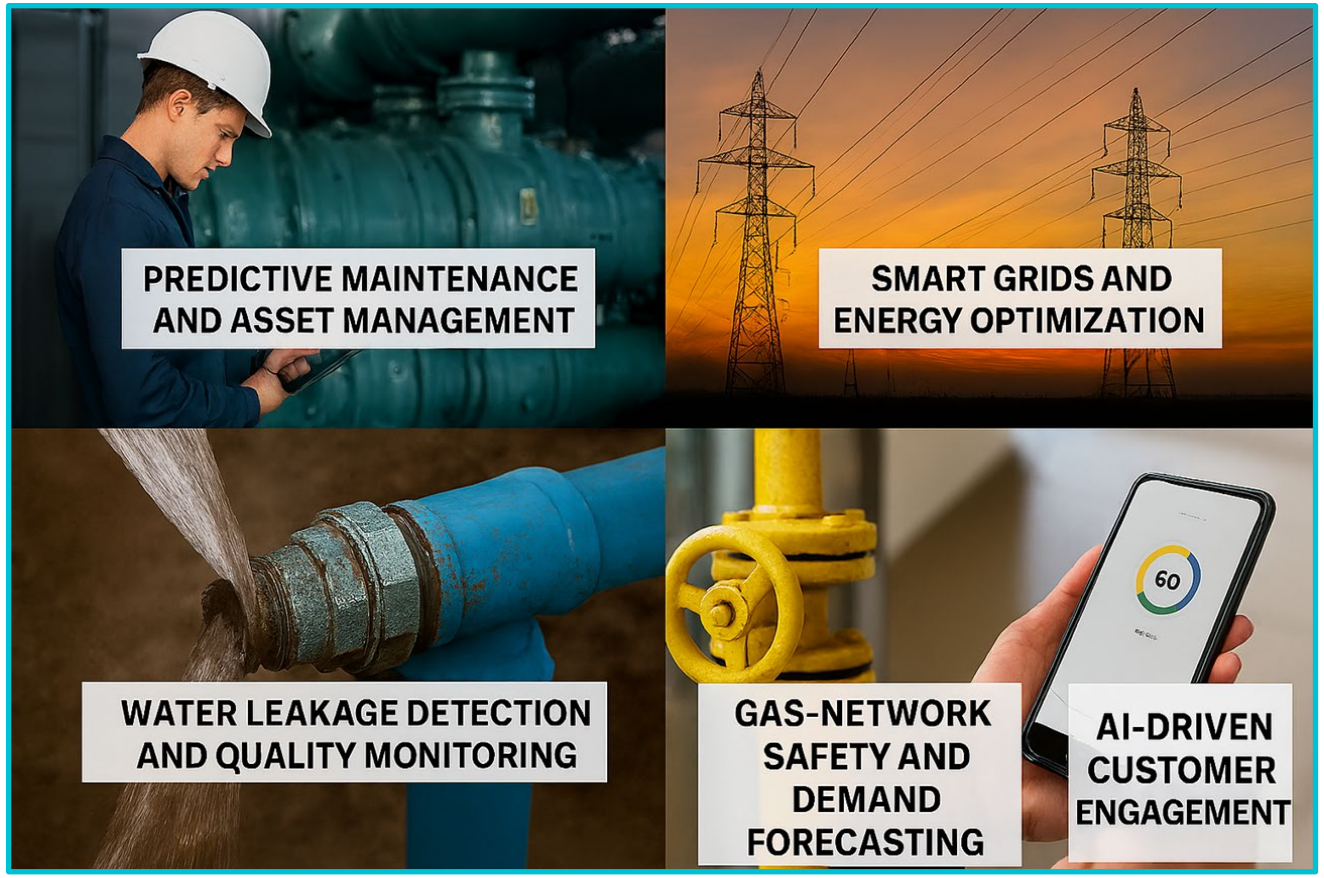
AI Use Case	Vendor
Predictive Maintenance & Asset Management	IBM, Microsoft, Oracle
Demand Forecasting & Load Management	Microsoft, Google, SAP
Grid Optimization & Stability	Cisco, IBM, NVIDIA
Customer Service & Engagement	Microsoft, Google, Amazon
Cybersecurity & Fraud Detection	Palo Alto Networks, Fortinet, CrowdStrike
Compliance & Reporting	SAP, Microsoft, Oracle

Examples of AI in the Public Utility Industry

Transforming Power, Water, and Gas Utilities through Artificial Intelligence

Key focus areas included but not limited to:

- Predictive maintenance and asset management
- Smart grids and energy optimization
- Water leakage detection and quality monitoring
- Gas network safety and demand forecasting
- AI-driven customer engagement and billing optimization



AI in Public Utility Industry-Vendor Mapping

AI Use Case	Vendors
Predictive Maintenance & Asset Management	IBM, Microsoft, Oracle
Smart Grids & Energy Optimization	Cisco, IBM, NVIDIA
Water Leakage Detection & Quality Monitoring	Bosch, Cisco, Microsoft
Gas Network Safety & Demand Forecasting	Microsoft, Google, SAP
AI-Driven Customer Engagement & Billing Optimization	Microsoft, Google, Amazon

TD SYNNEX | *Public Sector*

Contact Us

G. Wayne Owens,
Public Works Program Manager

Wayne.Owens@tdsynnex.com