

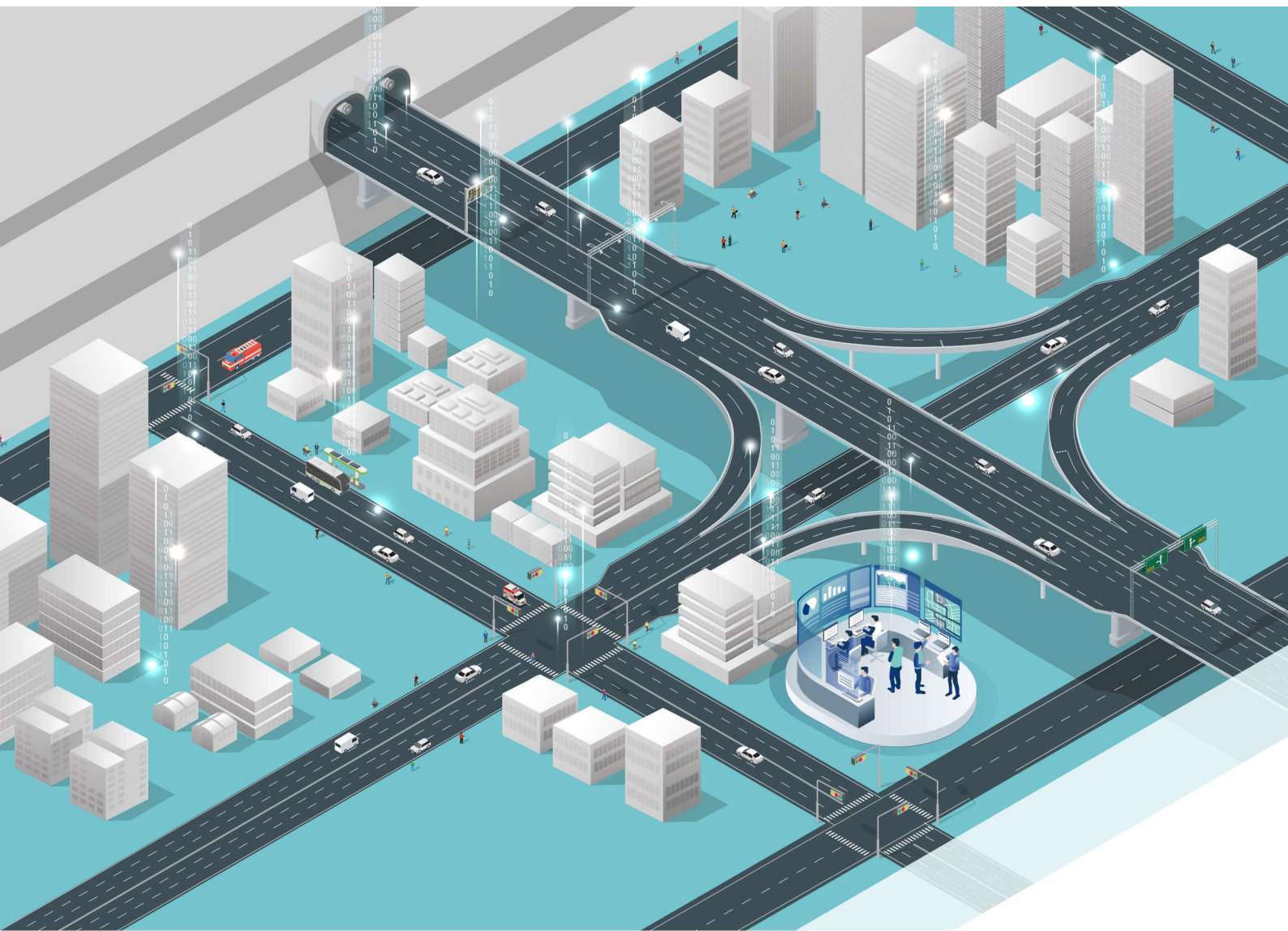


Powering Dynamic Cities With Advanced Traffic Management Systems



Check Out Our ITS Microsite
to Learn More!

www.moxa.com



Paving the Way for Safe, Sustainable, and Efficient Transportation

Advancements in AI, data analytics, and connectivity are rapidly transforming the Intelligent Transportation Systems (ITS) market, improving safety, efficiency, and sustainability. At the core of this transformation is the Vision Zero strategy, which strives to eliminate traffic-related fatalities and severe injuries while ensuring fair and safe mobility for all. Furthermore, the market dynamics of ITS are significantly shaped by sustainability goals, especially the push for decarbonization.

To achieve these goals, Advanced Traffic Management Systems (ATMS) are pivotal in ITS applications. They optimize traffic flow, reduce congestion, and ensure safer journeys for all road users. ATMS gathers data from sensors, cameras, and connected vehicles to offer real-time insights for traffic control and incident management. With this data-driven approach, decision-making becomes proactive, enabling timely interventions and ensuring smoother traffic operations.

In conclusion, the ITS market is set for significant growth, driven by technological advancements and the pressing demand for sustainable and secure transportation solutions. Vision Zero is central to the development of smarter and safer transportation systems, aligning with global decarbonization efforts. The expanding ITS market has the potential to revolutionize urban mobility, creating a future of intelligent, compassionate, and eco-friendly transportation.



ATMS Integration for Safe and Efficient Travel

The Advanced Traffic Management System (ATMS) is a cornerstone of Intelligent Transportation Systems (ITS), seamlessly integrating diverse subsystems in real time. Its primary goal is to coordinate a complete network that guarantees safety, mobility, convenience, and efficiency for travelers, drivers, and pedestrians.

By using cutting-edge electronics, communication, computing, control, and sensing technologies, the ATMS improves safety, optimizes operations, and enhances service quality through the continuous transmission of real-time data. By doing this, it effectively addresses and reduces many traffic-related challenges.

Intersection / Highway / Tunnel / Bridge



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|--|--|--|
| <ul style="list-style-type: none"> • Variable Message Sign System • Vehicle Actuated Speed Display System • Video Incident Detection System • Travel Time Management System • Road Weather Information System • Automatic Traffic Detection, Counting, and Classification System | <ul style="list-style-type: none"> • Mobile Radio Communication System • Ramp Metering • Emergency Call Box • Slope Monitoring System • CCTV Surveillance System • Vehicle Detection | <ul style="list-style-type: none"> • Enforcement System • Traffic Signal Control • Tunnel Monitoring System • Data Transmission System |
|--|--|--|

Control Room / Traffic Management Center



- | | |
|--|---|
| <ul style="list-style-type: none"> • Large-format Video Display • Central ATMS Server • Traffic Control Operator Desktops | <ul style="list-style-type: none"> • Network Management System • Video Recording Management System • Emergency Call Logger Management System |
|--|---|



Challenges in ATMS Modernization

Even though ITS holds substantial potential, especially in ATMS, there are a number of challenges that continue to exist. To reduce cybersecurity risks, it's crucial to upgrade aging critical assets. However, there is a lack of skilled personnel for smart transportation infrastructure management. Furthermore, there is a significant knowledge gap in modern system upgrades due to traffic engineers lacking expertise in network infrastructure.



Outdated Infrastructure

- Legacy traffic devices struggle to integrate with modern technology
- Manual device configuration via web UI is time-consuming



Tackling Slow Adoption

- Insufficient expertise hinders ITS modernization and optimization
- Operational continuity requires prompt on-site interventions, despite weather



Addressing Cyberthreats

- Device replacements are time-intensive
- Limited workforce and expertise challenge ITS cybersecurity efforts

Efficient Solutions for Reliable Dataflow

Our solutions ensure reliable traffic data transmission with redundancy measures across network and hardware infrastructures, guaranteeing uninterrupted dataflow. Our advanced network management system enhances operational efficiency by providing unparalleled system performance visibility, enabling swift incident detection and response, thus reducing traffic flow disruptions. Distinguished by reliability, user-friendliness, and resilient design, our comprehensive solutions accommodate diverse applications and users, ensuring seamless operation in any environment.

Commissioning



High Accessibility

to unlock the potential of aging traffic devices for smart infrastructure

Our comprehensive, reliable connectivity solutions seamlessly integrate legacy devices into modern IP networks, unlocking their full potential and extending their lifecycle while reducing OPEX and data transmission efficiently.

Operation



High Visibility

to remotely manage multiple sites and minimize downtime while bridging expertise gap

We offer user-friendly and easy network management solutions, reducing the dependency on a specialized workforce and making ITS modernization accessible to a broader range of professionals.

Maintenance



High Cybersecurity

to provide security management, ensuring cybersecurity in connected traffic systems

We provide tailored solutions, incorporating robust cybersecurity measures to protect cabinets and devices from potential threats, ensuring the integrity and reliability of OT equipment data and the entire system.

Comprehensive Solutions for Secured Networking

End-to-end Solutions — Bridging Edge to Networking

Network Infrastructure	Edge Computing	Edge Connectivity
 L2/L3 Managed and Unmanaged Switches  Secure Routers & Firewalls  Modular Switches  Industrial Wireless  MXview ONE Network Management	 Controllers  Edge Gateways  Industrial Computers	 Remote I/Os  Protocol Gateways  Serial Device Servers  Media Converters  Fiber Bypass Units  Video Encoder

PoE/PoE+/PoE++ Solutions — Powering Efficiency at Its Best

Modular Switches	Managed Switches	Unmanaged Switches
 ICS-G7852A/50A/48A Series  PT-G7828/G7728 Series  RKS-G4028 Series  ICS-G7752A/50A/48A Series  IKS-6728A-8PoE Series	 EDS-4008/4012/G4012 Series  EDS-P506E-4PoE Series  EDS-G512E-8PoE Series  TN-5516A-8PoE Series	 EDS-G205A-4PoE Series  EDS-P206A-4PoE Series  TN-5308-4/8PoE Series
Plug-in Modules	Powered Devices	
 INJ-24A Series  INJ-24 Series  IMC-P101 Series	 AWK-4131A Series  AWK-3131A Series  NPort P5150A Series	

IEC 62443-4-2 Certified Solutions — Advanced Security for ITS Sector

Secure Routers	Wireless APs	Secure-hardened Switches	Edge Computing
 EDR-G9010 Series	 AWK-3252A Series  AWK-1151C Series  AWK-4252A Series	 EDS-(G)4000 Series  RKS-G4028 Series	 UC-8200 Series

Boosting Efficiency With Seamless Deployment

Our design philosophy is rooted in the core principle of accessibility. By combining user-friendly features with highly resilient designs, our ITS solutions are suitable for a wide range of applications and users.

Enhancing Parking Efficiency With Intelligent Touchless Electronic Toll Collection Systems

Traditional ticket-based systems in urban parking often lead to delays and frustration. The intelligent touchless electronic toll collection system transforms parking management by enabling eTag-equipped vehicles to effortlessly activate gate openings, eliminating the need for tickets and reducing physical contact. Users can enjoy flexibility through credit card payments, while mobile notifications provide entry or exit permissions after successful transactions. This innovation ensures efficiency, convenience, and safety, marking a major leap forward in parking technology.

Challenges Faced

- Ensuring seamless integration and 24/7 operation across diverse parking environments
- Managing stringent temperature requirements during installation

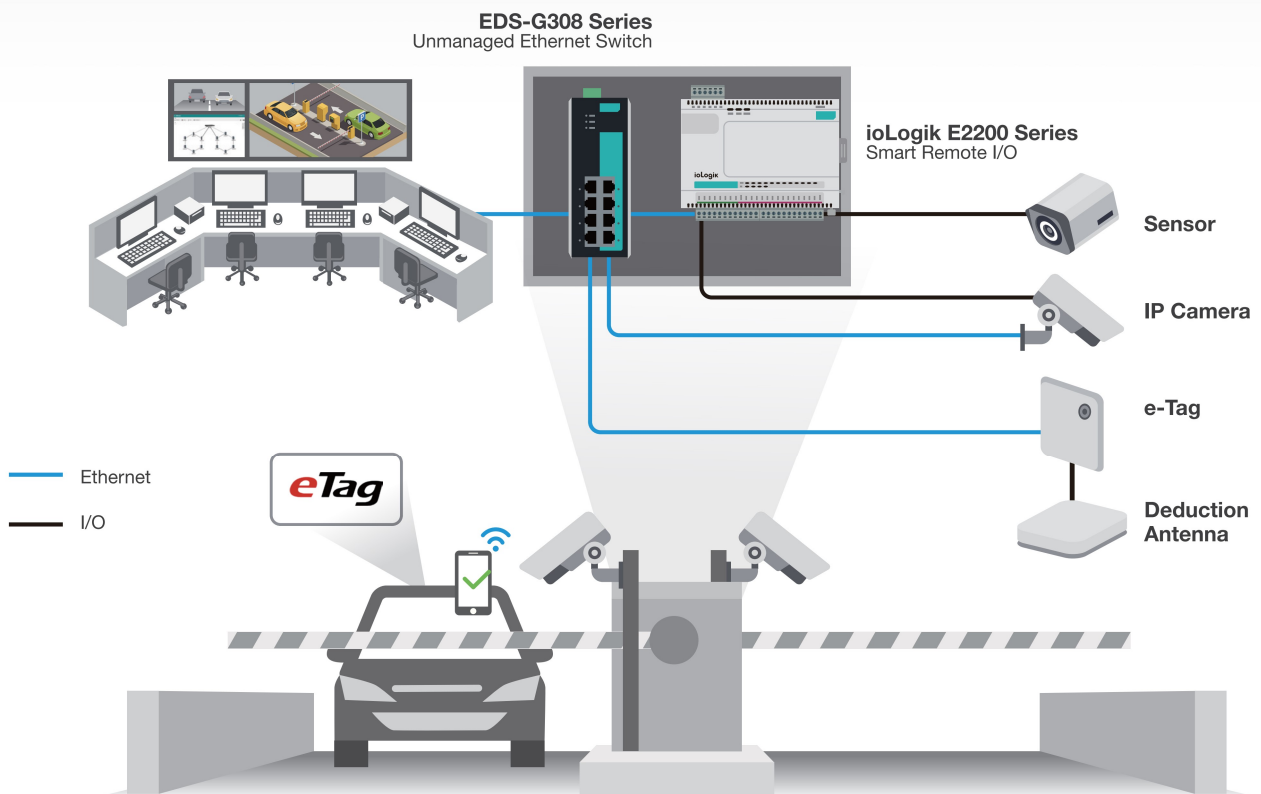
Why Moxa

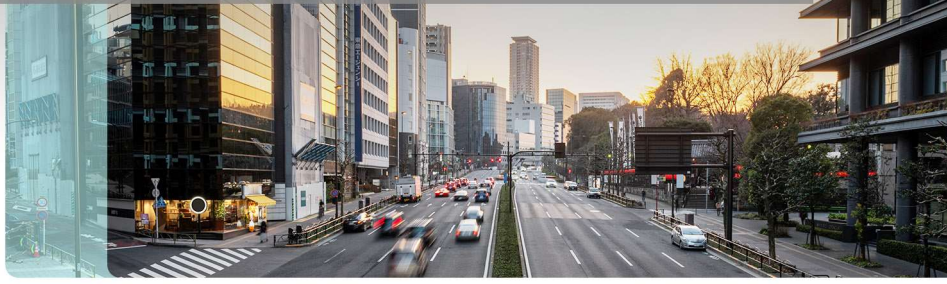
EDS-G308 Series Unmanaged Ethernet Switches:

- Versatile deployment from underground garages to open-air lots
- Ensures uninterrupted operation and high stability in diverse environments

ioLogik E2200 Series Smart Remote I/O Devices:

- User-friendly design simplifies setup and enables quick deployment
- Ideal for demanding conditions, ensuring reliable performance and ease of use





Enhancing Road Efficiency With Transit Signal Priority

Transit Signal Priority (TSP) prioritizes public transport at intersections to optimize road efficiency, making it a crucial Vehicle-to-everything (V2X) application. By using roadside units (RSU) and on-board units (OBU), TSP connects with Traffic Management Centers (TMC) to improve bus speed recommendations, reducing delays and enhancing transit efficiency.

Challenges Faced

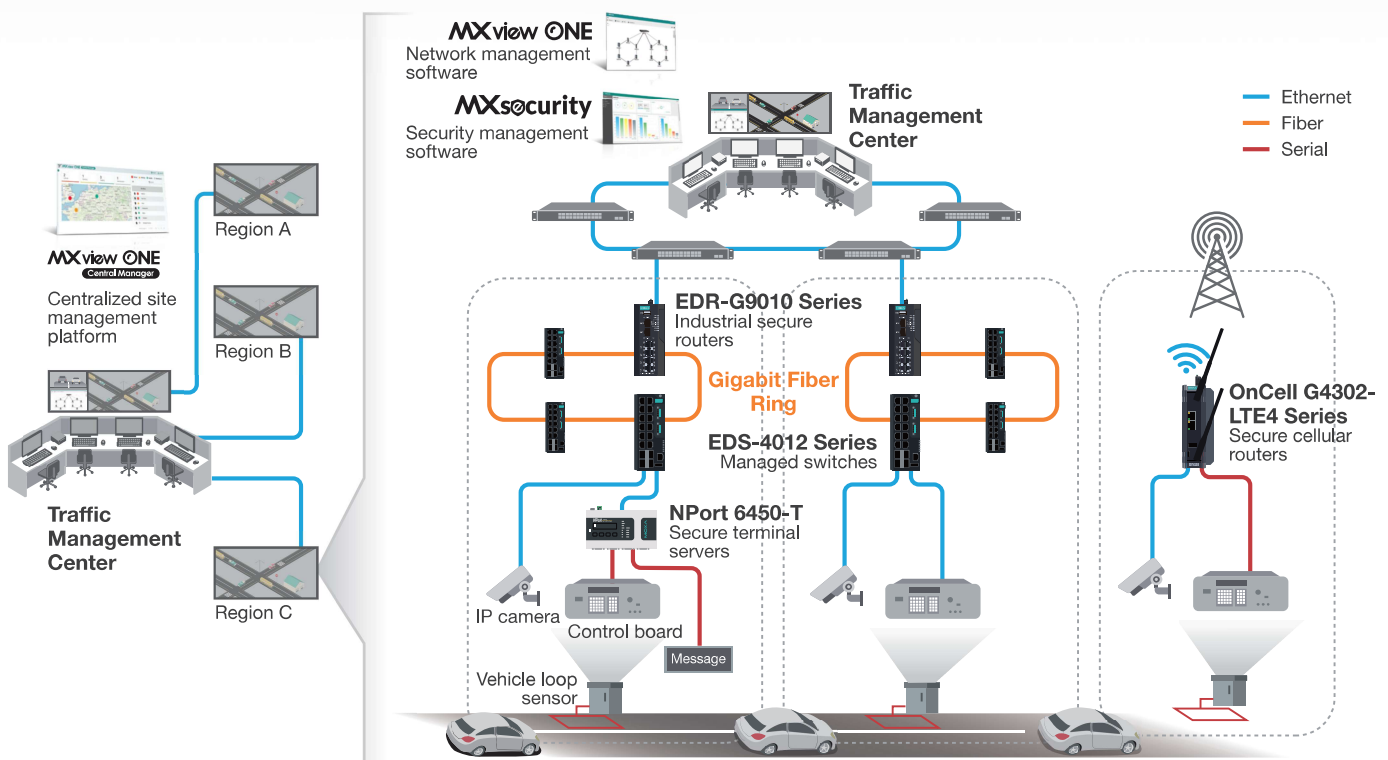
- Upgrading aging critical assets to support modern networking capabilities
- Limited human resources to manage and maintain extensive smart transportation infrastructure
- Increasing cybersecurity vulnerabilities introduced by networked devices

Why Moxa

We offer reliable solutions that meet the highest quality standards:

Wide-temperature, NEMA TS2 Certified Products: Ensure robust and secure communication between TMCs, OBUs, and traffic controllers, maintaining TSP effectiveness in demanding conditions

OnCell Series: Wi-Fi enabled cellular routers that provide secure remote control solutions for expansive roadside areas, ensuring reliable connectivity and operational flexibility





Optimizing Tunnel Control for Safe Traffic Management

Tunnel control systems are vital for monitoring and managing traffic and environmental conditions in tunnels to ensure the safety of road users. These systems monitor and analyze vehicular flow, accidents, and environmental hazards in real time to ensure efficient tunnel operations and safety.

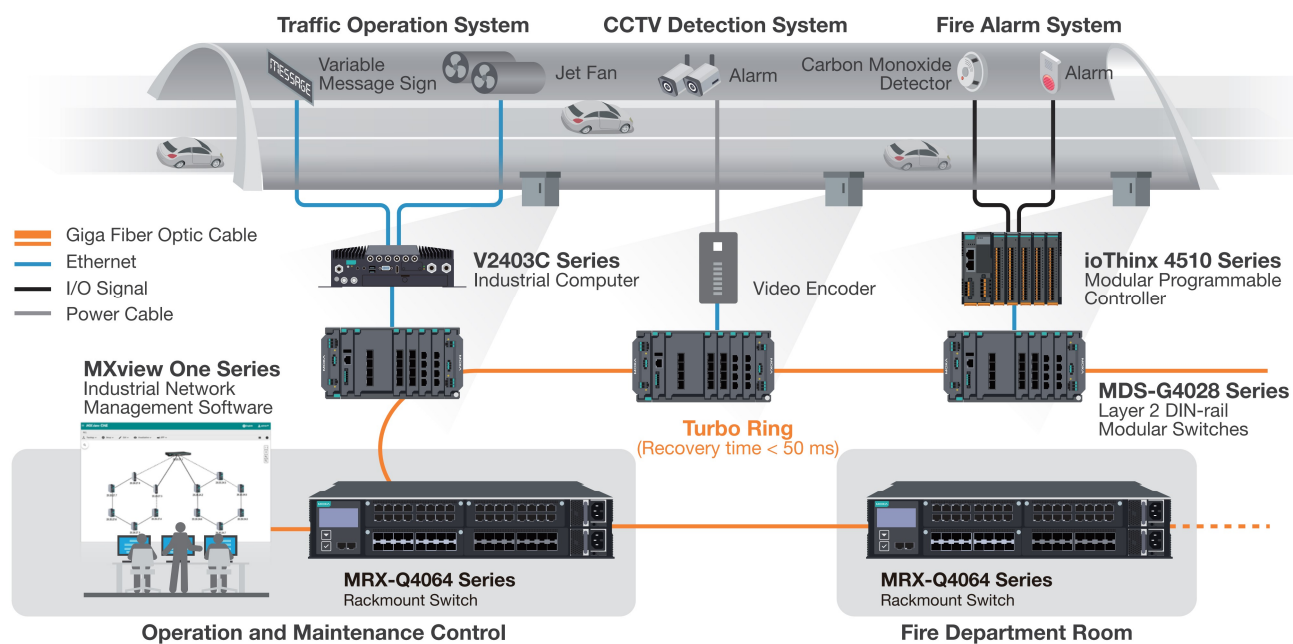
Challenges Faced

Minimizing tunnel closures and disruptions for commuters while maintaining stringent safety protocols

Why Moxa

We offer specialized solutions for tunnel control systems:

- Intuitive GUI and Advanced Business Connector (ABC) for efficient operation and maintenance (O&M)
- IEC 62443 SDLC-based device security to ensure robust cybersecurity
- SNMP v3-enabled I/O and networking for enhanced asset protection
- MXview One Series for comprehensive and secure management capabilities





Enhancing ATMS Backbones for Safer Highways

The efficient management of traffic is made possible by the pivotal network backbone of ATMS across highways, supporting a range of essential applications. Ramp metering improves traffic flow at entrances, while CCTV systems ensure safety and surveillance by monitoring vehicle activity. Vehicle detection systems supply real-time traffic density information, while emergency call boxes guarantee immediate help during emergencies. Variable message signs provide crucial information to drivers, while enforcement systems ensure compliance with traffic regulations. Road weather information systems offer essential weather updates for safer travel.

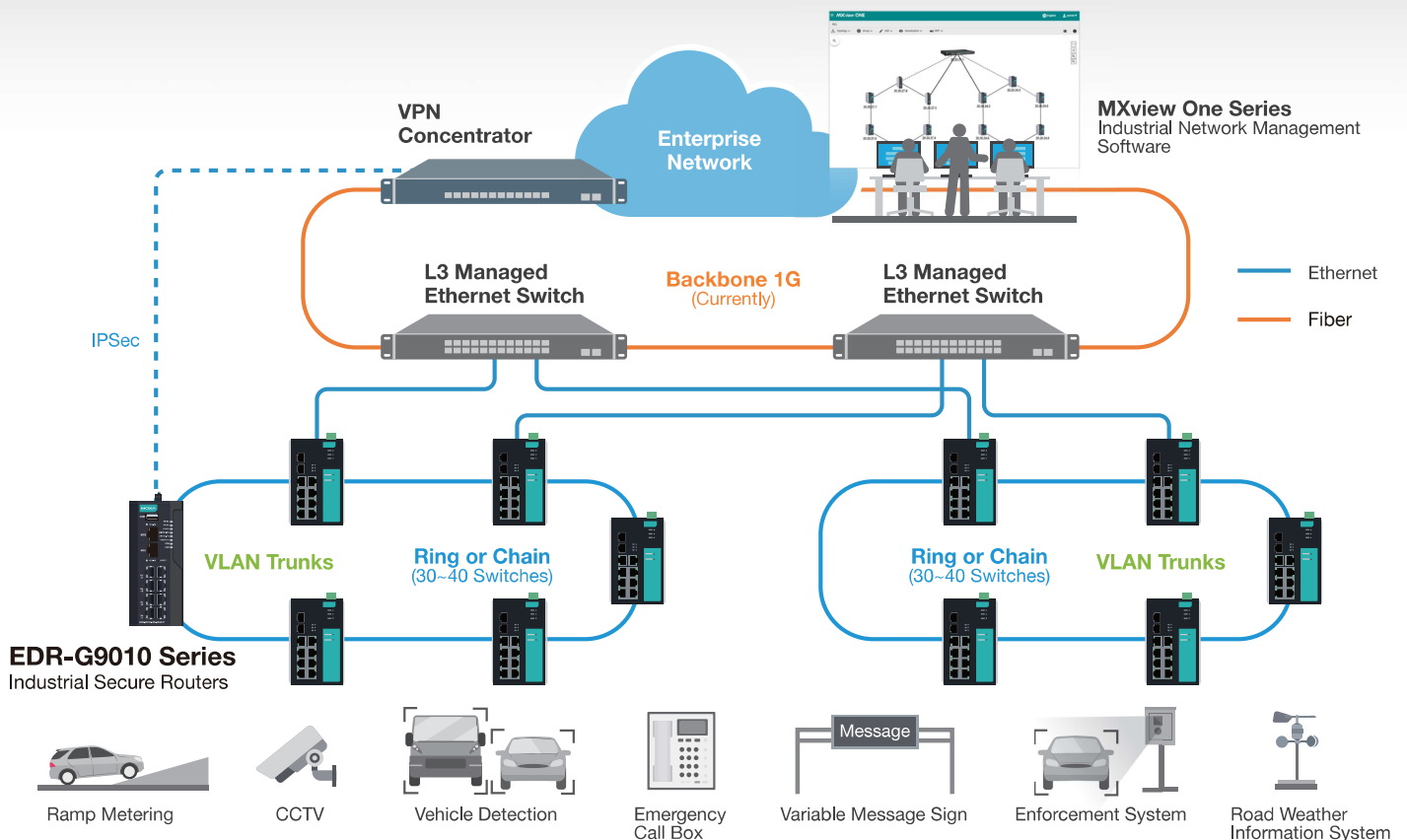
Challenges Faced

- Upgrading diverse aging critical assets
- Safeguarding legacy traffic signal devices from cyberattacks

Why Moxa

We offer Ethernet solutions that seamlessly integrate aging critical assets into Ethernet networks:

- EDR-G9010 Series secure routers provide robust protection against cyberthreats
- Wide operating temperature range (-40 to 75°C) ensures reliability in outdoor roadside cabinets





Enabling Safe and Efficient Urban Commutes

Effective communication is crucial in Advanced Traffic Management Systems (ATMS) to ensure urban road safety. Road safety and efficiency rely heavily on real-time information availability and seamless communication channels. ATMS leverages diverse data sources, such as traffic flow, speed, density, weather conditions, and surveillance videos, to uphold safety standards and enable seamless traffic flow on roads, tunnels, and bridges.

Challenges Faced

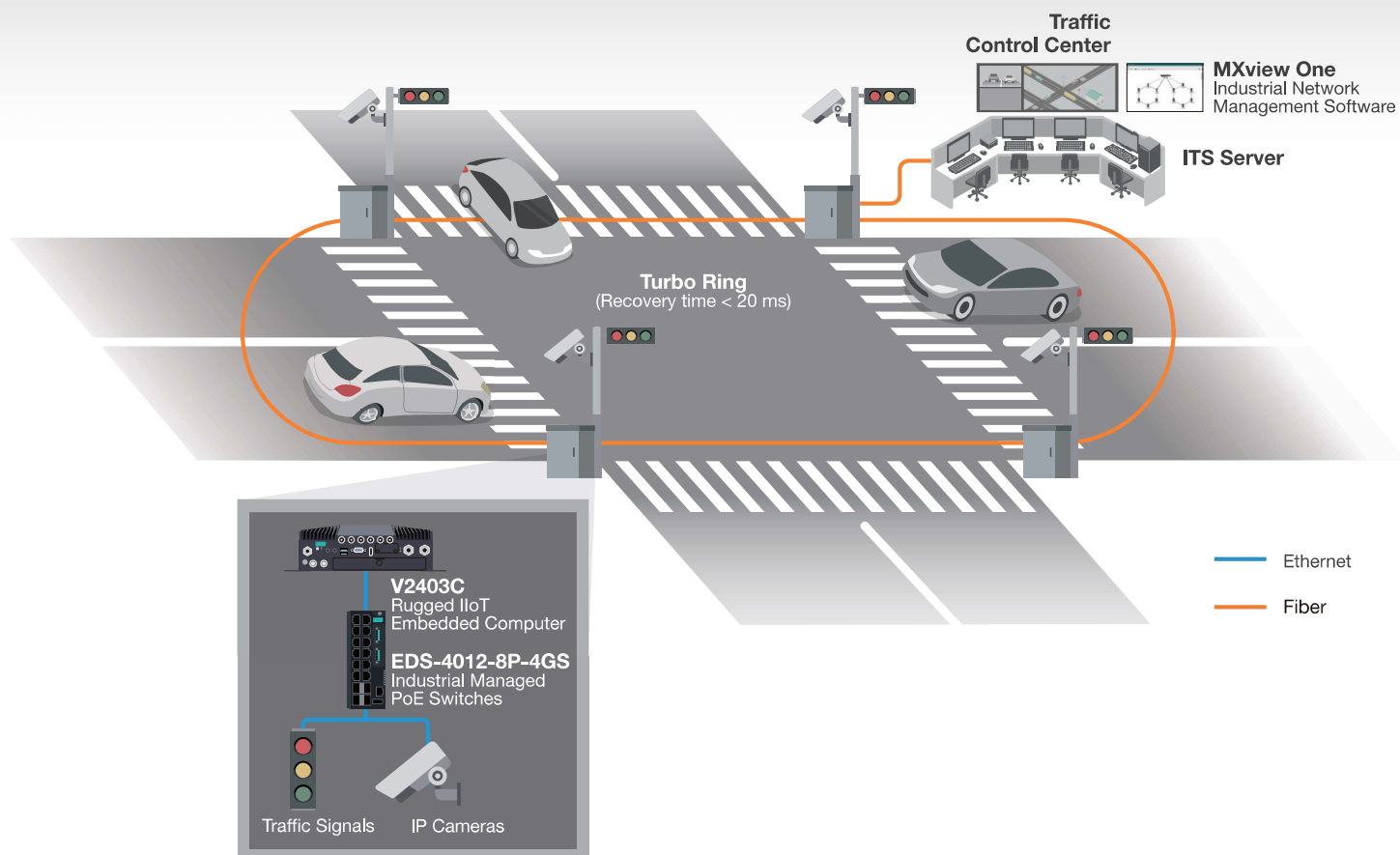
- Implementing an effective traffic management solution for seamless communication among vehicles, operators, and on-site control stations
- Establishing remote monitoring capabilities to promptly detect on-site failures in real time
- Gathering real-time data from diverse roadside sensors
- Ensuring robust design that can endure harsh outdoor environments

Why Moxa

We provide a comprehensive solution designed for real-time responsiveness in the dynamic ATMS landscape:

V2403C Series: Cutting-edge computing platform for ATMS, acts as RSU for sensor and surveillance data gathering

EDS-4012 Series: Managed switches that provide seamless communication with ATMS server





Streamlining Electronic Toll Collection for Modern Traffic Systems

The global electronic toll collection (ETC) market is projected to achieve a 6.5% CAGR until 2027. Initiatives to adopt cashless payment systems are fueling this expansion, with the goal of reducing traffic congestion, accidents, and environmental impacts.

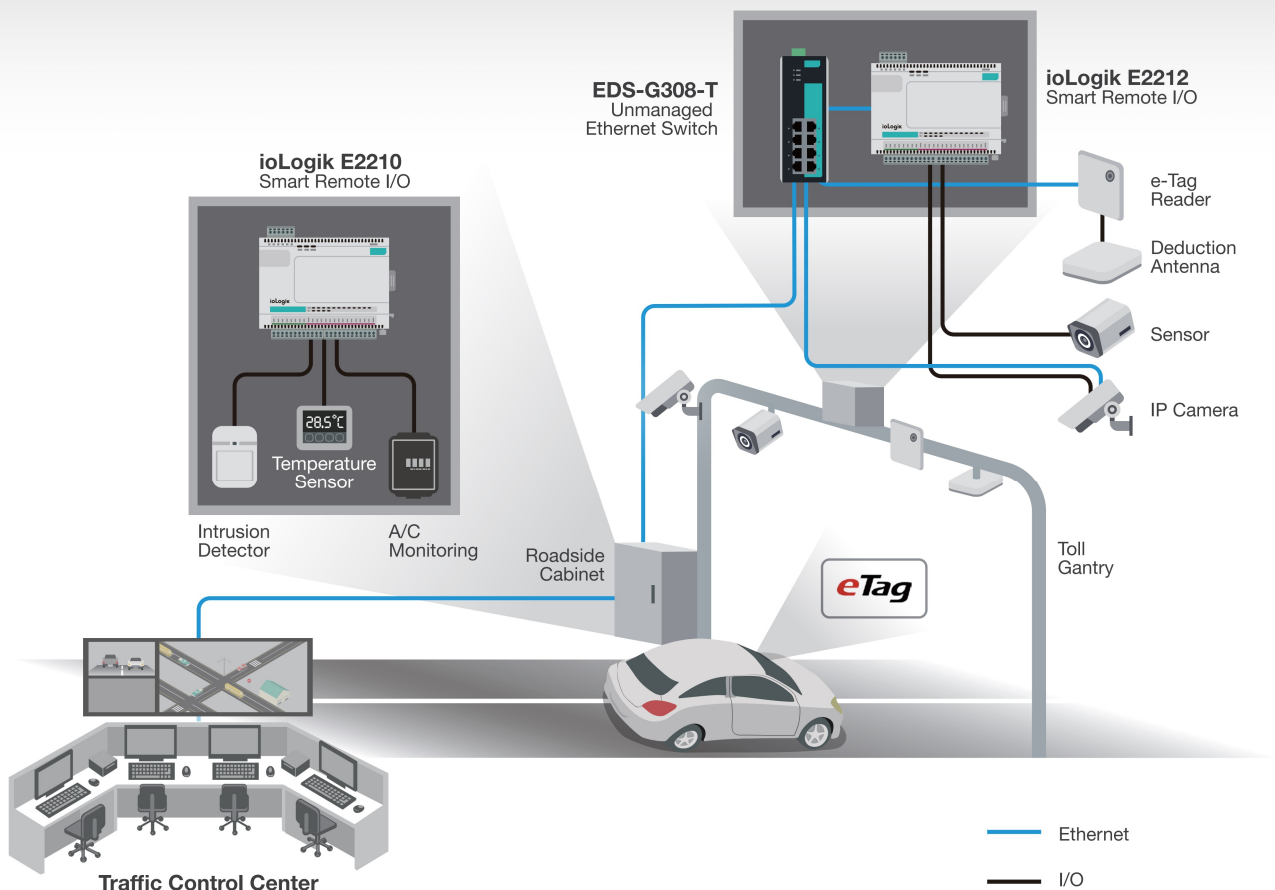
Challenges Faced

- Ensuring low I/O latency (< 4ms) to trigger IP cameras for capturing vehicle snapshots
- Providing high bandwidth capabilities for efficient data and image transfer

Why Moxa

We provide customized solutions tailored for electronic toll collection systems:

- ioLogik E2212 smart remote I/O with Click&Go control logic and SNMP v3 support
- EDS-G308-T unmanaged switches with multiple Gigabit Ethernet ports and fiber-optic options, extending gantry distance capabilities
- Wide operating temperature range (-40 to 70°C) to ensure reliability in outdoor installations





Your Trusted Partner in Automation

Moxa is a leading provider of edge connectivity, industrial computing, and network infrastructure solutions for enabling connectivity for the Industrial Internet of Things (IIoT). With 35 years of industry experience, Moxa has connected more than 102 million devices worldwide and has a distribution and service network that reaches customers in more than 85 countries. Moxa delivers lasting business value by empowering industries with reliable networks and sincere service. Information about Moxa's solutions is available at www.moxa.com.

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