



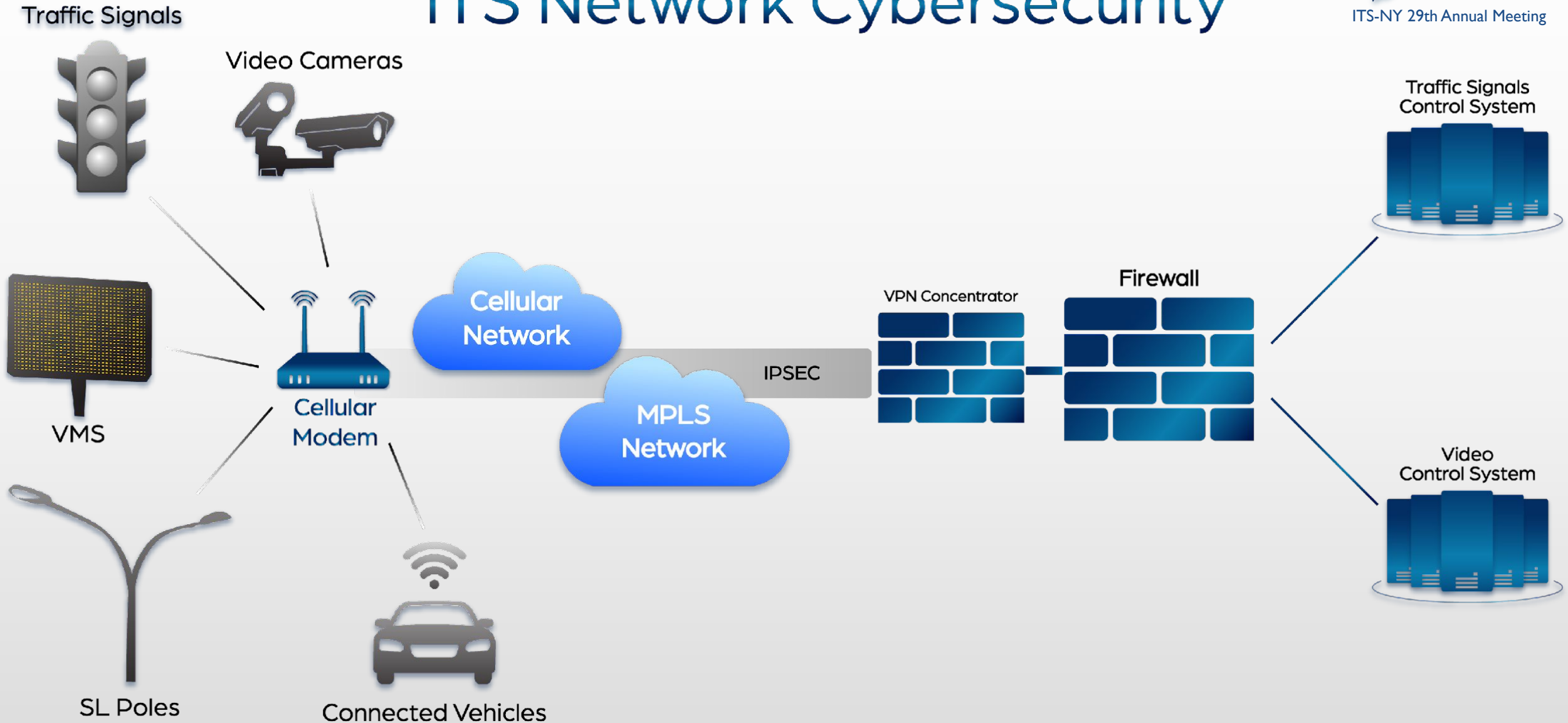
ITS-NY 29th Annual Meeting

Case Studies on Cybersecurity

In the era **Internet of Things (IoT)** technologies and IoT market grow from 3T in 2015 to 14T in 2021 the rapid growth of the IoT infrastructure create benefits for society and open new horizon for the ITS assets management.

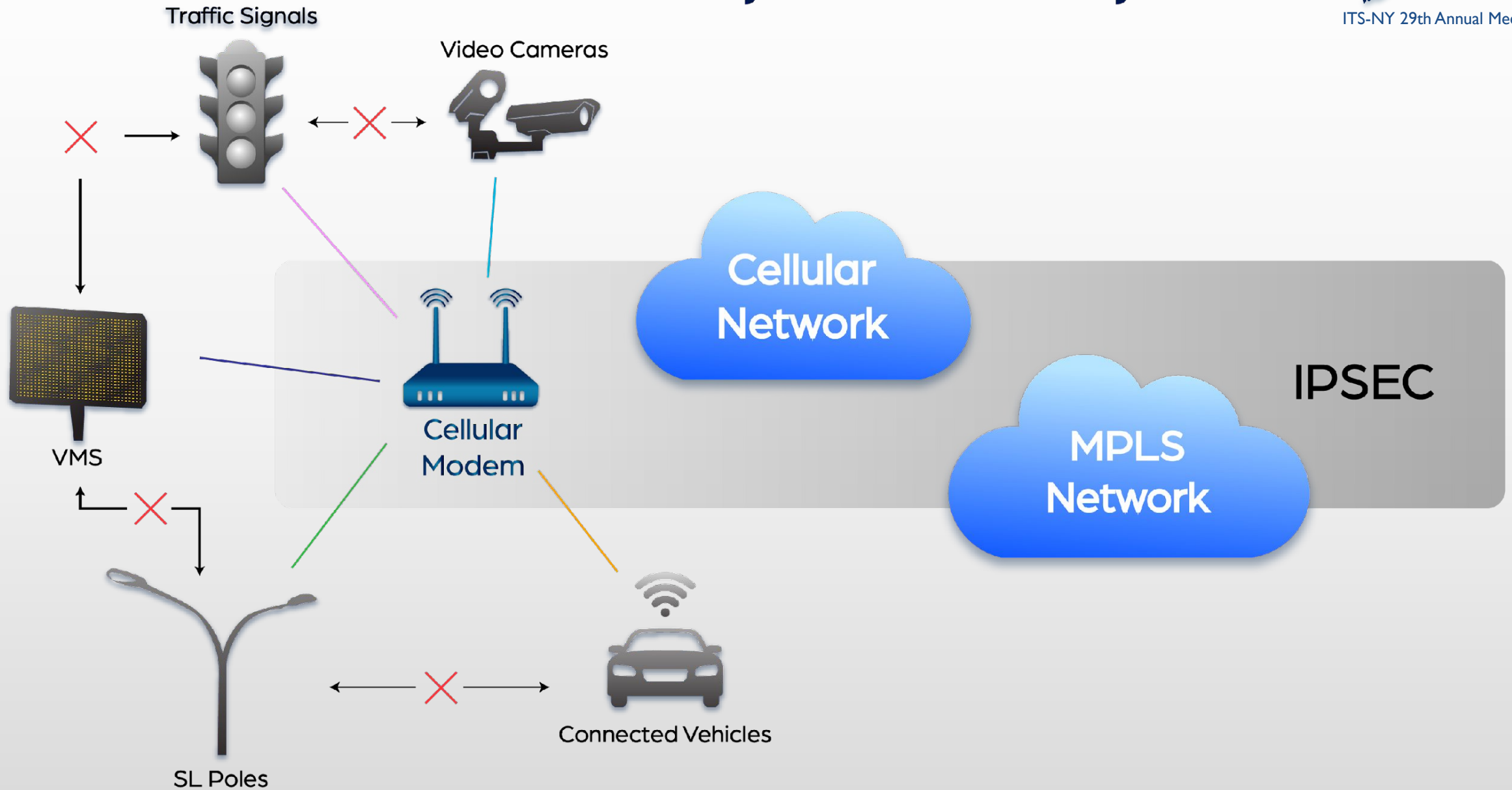
Intelligent Transportation Systems (ITS) as a part of SMART City IoT infrastructure required very high cybersecurity protection measurements and systems, however cyber-security isn't seen as a significant component in ITS and is paid minimal attention by governmental agencies, system safety and security are still treated entirely separately in different categories due to the lack of security awareness.

ITS Network Cybersecurity

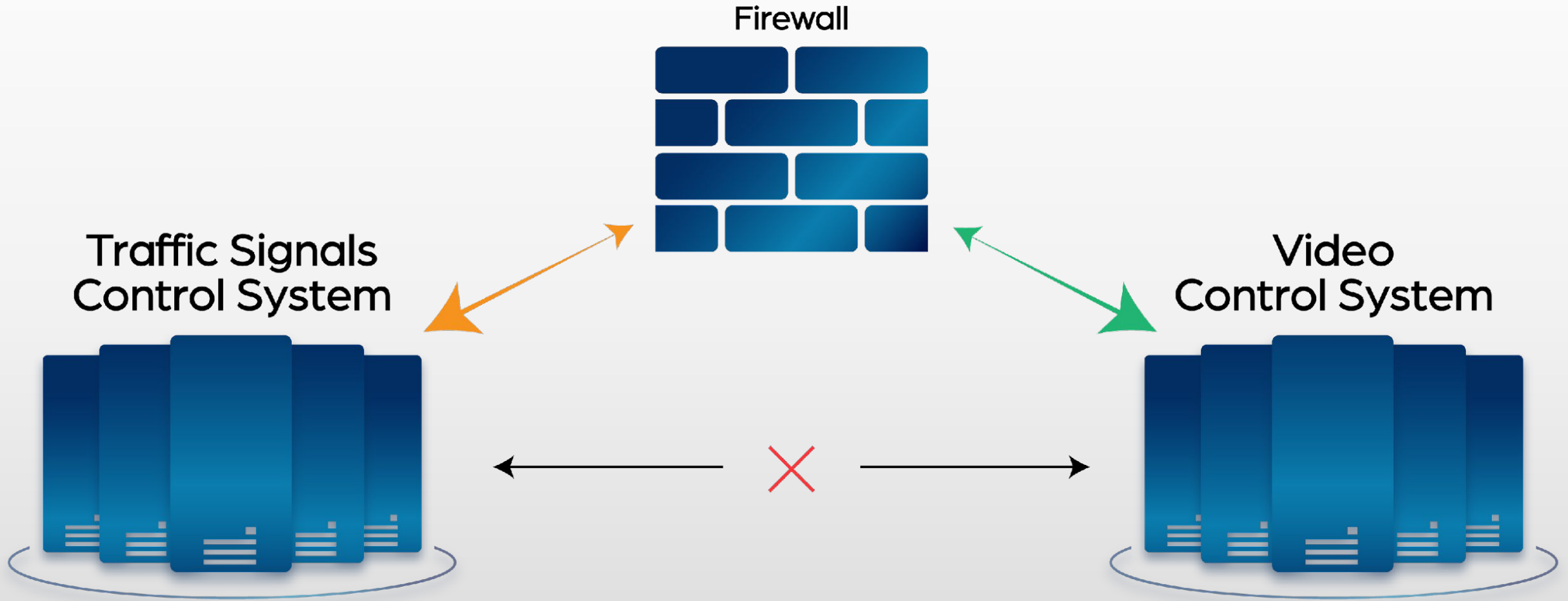


- Prohibit direct communications between IoT devices
- Prohibit communications between Control Systems
- Encrypt data in fly (IPSEC)
- Encrypt data at rest (CRYPTO)
- Secure connections with NGFW
- Use Multi Factor Authentication

Field Cybersecurity



Central Cybersecurity



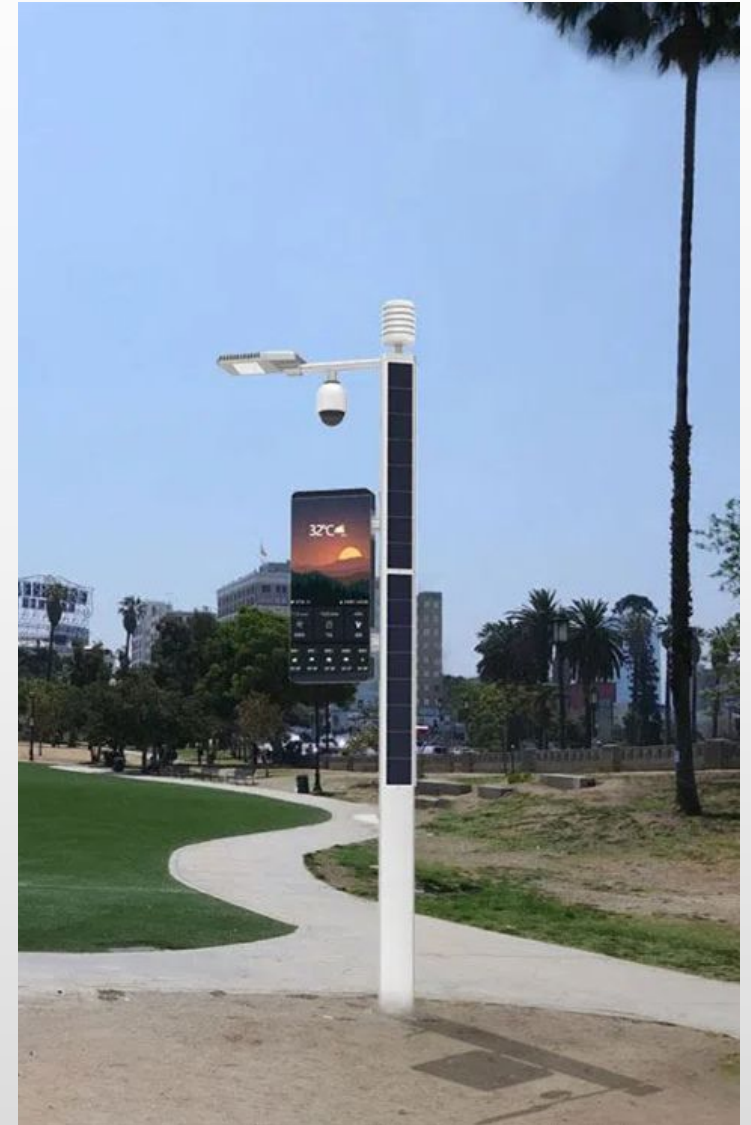
IoT Cameras and VMS



IoT Smart Devices



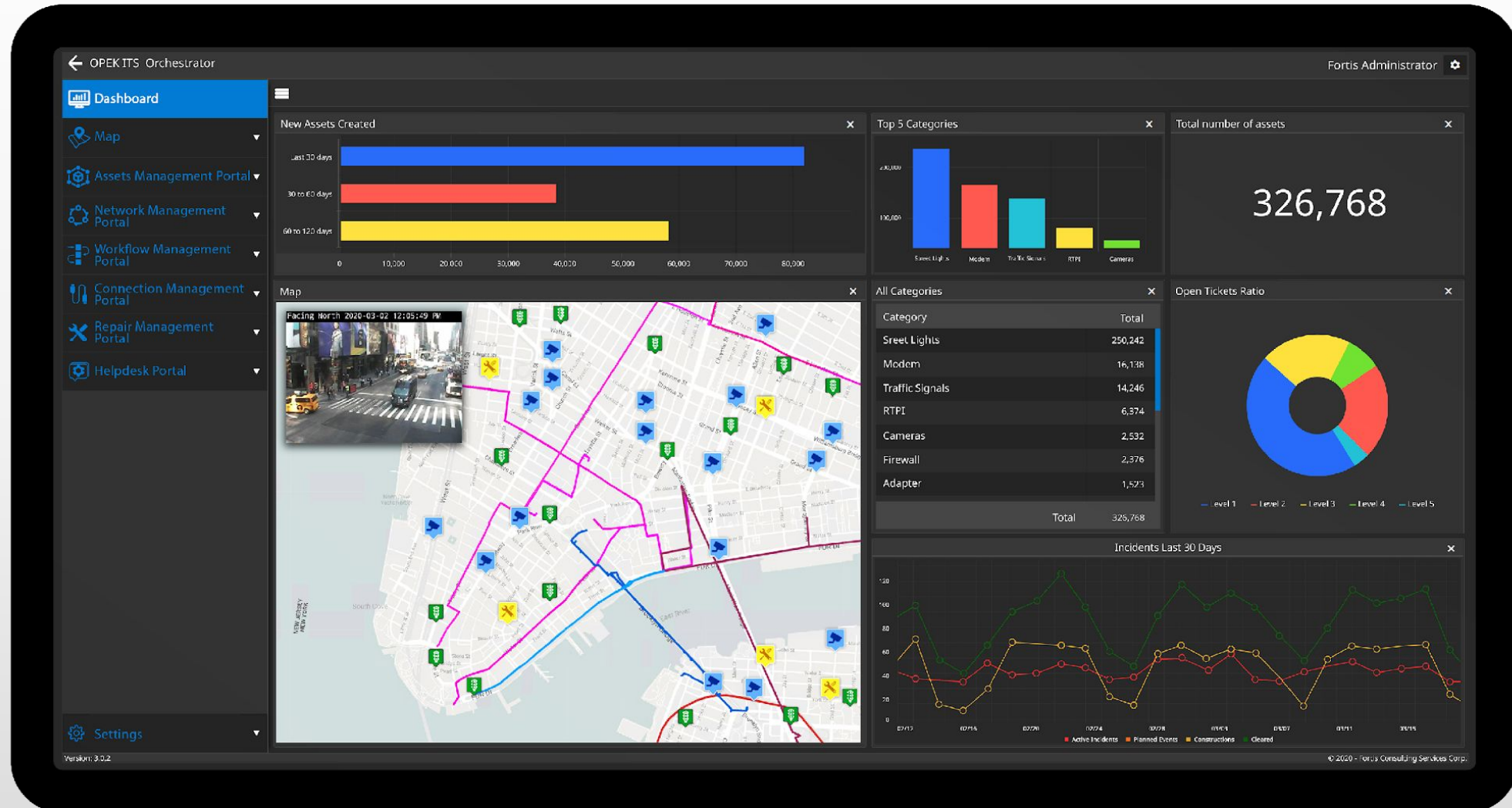
IoT Smart Poles



IoT Connected Vehicles



Assets Management Portal (AMP)



Assets Management Portal (AMP)

- Track in real-time physical and technological characteristics, as well as contractual and financial aspects of the assets.
- Store and manage a variety of asset specific documents (purchase orders, invoices, pictures).
- Automated service contracts and warranty management.
- Generate a variety of custom financial and technical reports.
- Includes alarms, manual and automated assets monitoring capabilities.
- Provides clear, concise, and easy way to locate asset components across multi-location and multi-agency environments.

Network Management Portal (NMP)



Network Management Portal (NMP)

- Scales to support very high network monitoring data ingest volumes.
- Supports detailed IoT device monitoring data.
- Provides detailed status of wireless point, data usage, and audits wireless providers.
- Dynamic dashboards allows the user to display and monitor a selected network view, display devices, and interface with devices from the dashboard.
- Reports on performance by presenting graphs or/and GIS views.
- Integrated with Assets Management, Helpdesk, Environmental Management and Connection Management portals.

Environmental Management Portal (EMP)

OPEK ITS Orchestrator

Dashboard

Map

Assets Management Portal

Network Management Portal

HelpDesk Portal

Environmental Management Portal

Dashboard

Discover

Devices

Collections

Settings

Settings

UPS

Device Name	Power	Status	Device Model	Serial Number	IP Address	MAC Address	Firm
	OFF	ONLINE					UPS
	OFF	ONLINE					UPS
	OFF	ONLINE					UPS

UPS Dashboard

Dashboard Information Controls

Est. Charge Remains 100 %

Est. Minutes Remains 61 min

Battery Voltage 54.5 V

Battery Temperature 75.2 °F

Connection Status Online

Input Voltage 118 V

Output Voltage 118 V

Input Current 0 A

Output Current 5 A

Input Frequency 60 Hz

Output Frequency 60 Hz

Battery Status Normal

Seconds on Battery 0 sec

Est. Charge Remains 100 %

Est. Minutes Remains 57 min

Battery Voltage 54.5 V

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Environmental Management Portal (EMP)

- The Environmental Management Portal (EMP) is designed to monitor power infrastructure (UPS's, PDU's, Generator's, Charging stations, Solar panels) and environmental conditions (temperature, humidity, etc.) across facilities and outside environments.
- EMP minimizes maintenance effort and arterial closures times.
- The portal enables organizations to reduce power consumption and its environmental impact and increase its operation efficiency.
- EMP provides the foundation for the "Green ITS Cabinets" initiative, which allows NYCDOT to decrease overall power consumption within traffic cabinets, simplify troubleshooting of the issues.

National Transportation Cybersecurity Recommended Standards

- US Department of Transportation Order 1351.37 Chapter 37
- Federal Highway Administration Order 1640.3
- NIST Cybersecurity Framework NIST Special Publication 800-171 Rev. 2, Feb 2020

References

(Photo and Image Credits)

Slide 8 - IoT Cameras and VMS

IoT CCTV Solutions – www.Robustel.com

VMS Sign - Virginia DOT @ Twitter

Slide 10 - IoT Smart Poles

Smart City Pole System – www.continentalpole.com

Smart City Smart Pole - www.smart-solar-lights.com

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Q&A