



Smart communities: On the road to digital transformation

eBook

Alcatel·Lucent 
Enterprise



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Overview

Every local community wants to improve its appeal, have a dynamic town centre, as well as thriving suburbs. Digital transformation is no longer considered a path only for large cities, it can also provide an effective path forward for communities of all sizes.

How digital transformation helps communities get smart

The Internet of Things (IoT), all its connected objects, as well as simple and effective online services can help all communities address current challenges more effectively by:

- **Reducing the digital gap:** Providing the necessary infrastructure to power connectivity for all
- **Supporting economic development and regional attractiveness:**
With modern public and tourist services
- **Ensuring effective public safety services:** Accelerating awareness, encouraging citizen and emergency teams' collaboration, ensuring coordinated intervention and resolution
- **Addressing energy transition:** Reducing carbon footprints with smart mobility, transportation, waste management and recycling

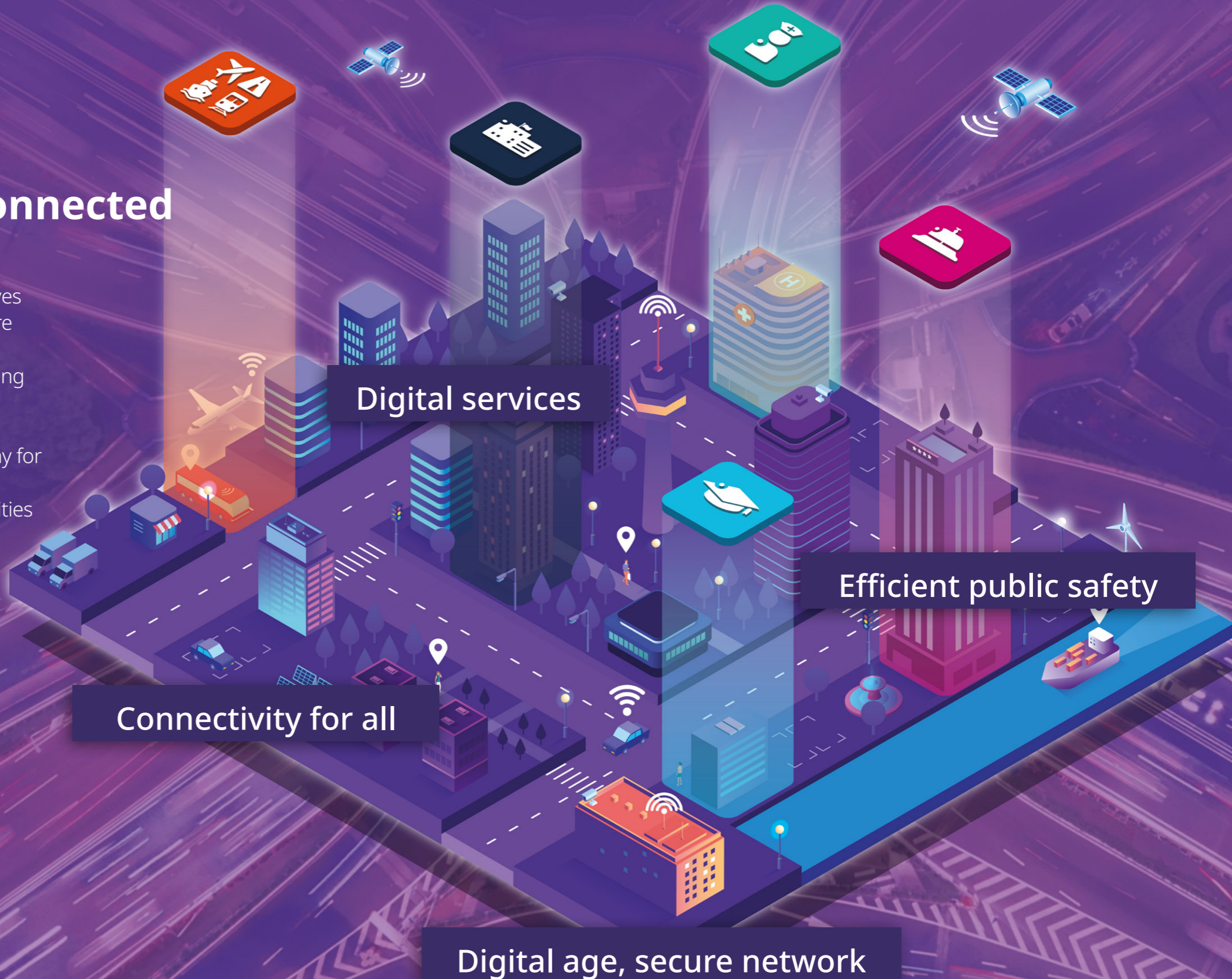
This eBook explores current solutions and how other cities and states have addressed them.





A vision for connected communities

Alcatel-Lucent Enterprise believes that connected communities are more resilient in the face of emergencies and change, making them more prosperous and attractive. Digital-ready, secure infrastructures can pave the way for modern services and effective communications that communities need today.



Digital services

Efficient public safety

Connectivity for all

Digital age, secure network



Better connectivity for all with Wi-Fi 6 and 6E

Municipal Wi-Fi is indispensable to reduce the digital divide and bring connectivity to users and connected objects in public spaces. A secured and good quality municipal Wi-Fi enables smart city devices and digital citizen services (mobile applications in public transportation, museums, education campuses or public squares).

Wi-Fi 6 offers better and more stable connectivity in dense environments allowing more clients to connect to the same access point (AP) simultaneously. [New Wi-Fi 6 and 6E access points](#) offer a more secure and faster mobile user experience, especially in saturated indoor and outdoor locations. Both bandwidth and throughput are higher and the battery life of the connected devices is significantly extended.

- **Reliability:** Improved connectivity, consistency and stability for a better end-user experience
- **Capacity:** Handle more devices simultaneously with a better Quality of Experience (QoE) for bandwidth-hungry applications
- **Efficiency:** Extended battery life of connected devices with the Target Wake Time (TWT) feature
- **4x more bandwidth:** 4 times faster speed for each connected device
- **Security improvements:** Encrypted traffic and WPA3 ensure better privacy and protection of transmitted data
- **Additional 6GHz channel (Wi-Fi 6E):** Reducing congestion can also be used for new and emerging Wi-Fi technologies

WiFi4EU compliant

Alcatel-Lucent Enterprise access points are [WiFi4EU compliant](#), offering extremely cost-effective, enterprise-grade quality of services for WiFi4EU funded projects.

eBook

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Reliability

Improved connectivity, consistency and stability for a better end-user experience



Capacity

Handle more devices simultaneously with a better QoE for bandwidth-hungry applications.



Efficiency

Extend battery life of connected devices with the Target Wake Time (TWT) feature

4x

More bandwidth

Increased capacity for more devices



Security improvements

Encrypted traffic and WPA3 ensure better privacy and protection of transmitted data



An expert perspective: Wi-Fi 6 and 6E and high-speed public connectivity for all users and objects

Wi-Fi 6 and 6E provide a better experience for secure connectivity, mobility and performance, offering a dramatic step forward for smart cities digital infrastructure. Benchmark tests indicate that modern Wi-Fi technology delivers 10x quicker speeds when compared to previous generation Wi-Fi 5 technology. For networks supporting large numbers of users and connected objects/IoT, such as cities or public spaces, that tend to get bogged down in performance and capacity, Wi-Fi 6 or 6E might just be what you've been waiting for.

What about interference from neighbouring networks?

The [Alcatel-Lucent OmniAccess® Stellar 1320 Access Point](#) for indoors and [OmniAccess Stellar 1360 Access Point](#) for outdoors automatically monitors for interference and connected users and others from rogue devices. The OmniAccess Stellar solution helps minimise conflicts and interference with neighbouring networks and guarantees coexistence in highly dense deployments.

The battery life of connected devices on your WLAN, especially those devices in remote or hard to access areas is a very real concern.

Wi-Fi 6 introduces an energy saving feature called Target Wake Time (TWT). This feature reduces energy consumption by allowing client devices to sleep longer, and wake up to less contention, extending the battery life of smart devices and IoT sensors.

Distributed intelligence enables simplified deployment throughout the community. It optimises connectivity and avoids performance failures when the number of users increases. It also offers the flexibility to evolve Wi-Fi infrastructure without constraints.

In addition to the Wi-Fi 6 features, Wi-Fi 6E enables access to a new 6GHz spectrum providing up to 1.2 GHz of fresh uncongested, unlicensed band, to support growing capacity and performance needs.

Given that upgrading your network is not as fast as upgrading a personal device, now might be a good time to start planning your network infrastructure upgrade before your users and IoT devices bring your network to its knees.

Nicolas Duez, WLAN Business Division Leader



“The robustness of our infrastructure has made that we now support over 40 public safety agencies in Scotland, people like Food Standard Scotland, Transport Scotland, Marine Scotland, Forestry Scotland all use our desktop solution and that’s all underpinned by the Alcatel-Lucent Enterprise technology.”

MARK HAGART, HEAD OF DATA CENTRE AND NETWORK SERVICES (DCNS), ITECS

Scottish Government moves to Digital Age Networking

The Scottish Government network serves several core government departments, government agencies and embassies in Scotland and abroad. The network infrastructure supports core departments, such as Justice and Education, all central core government services, and more than 40 public sector agencies. The network operates from Scotland to Dublin, London, and Brussels. The first objective was to centralise network management to offer secure and consistent services to all agencies.

The newly centralised network solution offers:

- Enhanced network security at the user and device level
- Simplified operation and management with central visibility
- Simplified licensing for easier procurement
- A robust network infrastructure for harsh conditions on land and at sea
- Openness for third-party integration and future evolution
- Dedicated support resources and services

[Read the full success story](#)



Digital Age Networking for smart communities

Digital Age Networking provides government certified solutions, enabling public sector organisations to deploy secure and resilient network infrastructures. The advanced multi-layer network security core provides comprehensive BYOD and IoT services, and protects highly available, real-time communications systems required for; confidentiality, event awareness, notification and response coordination. Network automation improves IT team efficiency and reduces the risk of human error during configuration.



Autonomous Network

Automate mission-critical network operations and improve user experience



IoT

Scale up digitalisation with secure IoT onboarding and management



Business Innovation

Accelerate transformation with automated workflows

Alcatel-Lucent Digital Age Networking Strategy



Deliver public services continuity when it is needed most with secure, remote communications

Help public service teams communicate from home as if in the office

- Back office teams receiving a high volume of calls, such as switchboards, hunt groups or contact centres can benefit from a full-featured business VoIP phone with Windows® or macOS®.

An **IP Desktop Softphone** routes office numbers to home or mobile devices to maintain continuity regardless of location and avoids the complexity of switching between work and personal numbers or devices. It is quick and easy to deploy — just plug-and-play to get started.

Create productive remote working spaces

- Enable multimedia collaboration for remote, mobile, or back-office teams or devices
- Provide high-definition video and audio conferencing, seamless instant messaging, instant screen sharing and secure file transfers
- Route all calls to employee office numbers or to their remote devices
- Broadcast information to entire teams and departments in real-time

Try Rainbow Enterprise!

Our cloud-based communications and collaboration platform is General Data Protection Regulation (GDPR) and ISO 27001 compliant and adheres to strict data confidentiality procedures to deliver secure communications. Additional certifications include ANSSI CSPN, HDS in France, ENS in Spain, AGID in Italy, FERPA in the USA and a server wide C5 certification of our hosting Partner OVH. It is simple to deploy on smartphones, computers and tablets and works perfectly as a standalone solution or paired with Alcatel-Lucent Enterprise telephony systems.

Help teams securely access tools, information and files from anywhere

- Securely extend your corporate network to home environments and enable public service personnel to connect remotely
- Easily access non-cloud-based or proprietary government applications
- Provide extensive access to critical resources
- Connect multiple office tools, including office fixed phones (Power over Ethernet (PoE) port) to handle a large volume of calls
- Manage home internet bandwidth to prioritise VoIP calls and work applications

Get the Alcatel-Lucent OmniVista® Cirrus Network Management as a Service license free for one year when you purchase an OmniAccess Stellar AP1201H access point

A plug-and-play solution for remote workers after initial cloud-based configuration; employs an agnostic cloud-based architecture and controllerless management.



The right partner delivers a digital future for schools

Digital transformation with OmniAccess Stellar and Rainbow

How digitalisation in schools works

The path toward a digital school is paved by a digital pact that includes infrastructure, communications and devices. Now is the time to choose the network infrastructure, digital equipment and communications options that teachers and students require. The integration of digital media into schools represents a complex innovation process for which no turnkey solutions were previously available. With ALE intelligent and reliable network and communications solutions, we can help you create a modern, digital learning environment in your school.

Today's education system is shaped by a number of influences. From textbooks to curricula, from teaching to marking assignments — teaching and learning is becoming increasingly digitised.

Rainbow is a GDPR compliant communications platform that enables teachers, students and parents to communicate using chat, video or IP telephony, individually or in groups, as well they can share documents. Data is securely saved on the school server.

Rainbow also enables connectivity to existing school administrations, educational systems and emergency reporting systems. The connection is made simply through technical interfaces that can be made available.

Rainbow Classroom provides communications and collaboration capabilities in an environment that is familiar to you, with your learning management system. Seamless integration enables both instructors and students to access data from the existing LMS and start virtual classrooms from a well-known interface. As an evolution of Rainbow cloud-based services, Rainbow Classroom provides collaboration with instant audio, video and IM sharing from within your learning management system. Participants, either Rainbow Classroom users (students and teachers) or external guests (lecturers) connect to the collaboration space using a highly secure Rainbow Classroom web application that supports WebRTC standard for audio and video.





Modern WLAN for 80 schools in Münster

More than **1,600 OmniAccess Stellar Access Points** provide high-performance **wireless connectivity** for students and staff in a single **unified network**, centrally managed by the municipal IT provider, citeq.

The new WLAN will provide a secure BYOD capability, allowing teachers and students, for the first time, to access the network using their personal mobile devices. The solution can also deliver tailored services to support learning in the classroom, including an interface to a dedicated **“Time for Kids” portal** which provides digital access to learning aids and educational content.

Continuous uptime is ensured with all network management operations running across two separate servers for maximum availability. The **network can easily be scaled** for future expansion and to support greater bandwidth demand.

[Read the full City of Münster success story](#)



“Increased digitisation of the schools is at the top of our agenda. The roll-out of a reliable, centrally managed WLAN network connecting all Münster schools is a core element of this ambitious project. The combination of the modern ALE technology and NTB expertise has proven itself during this step in our digital transformation journey.”

STEFAN SCHOENFELDER, BETRIEBSLEITER, CITEQ



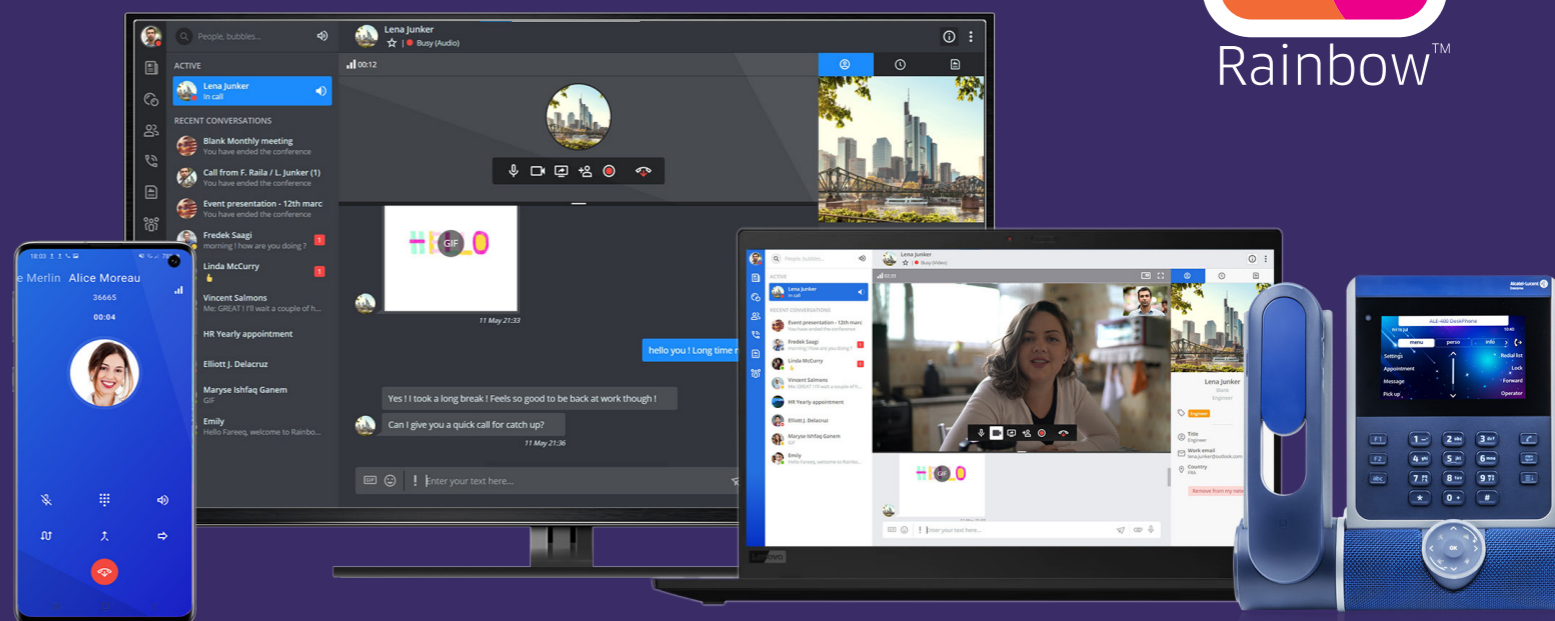
Rainbow

The secure messenger for schools

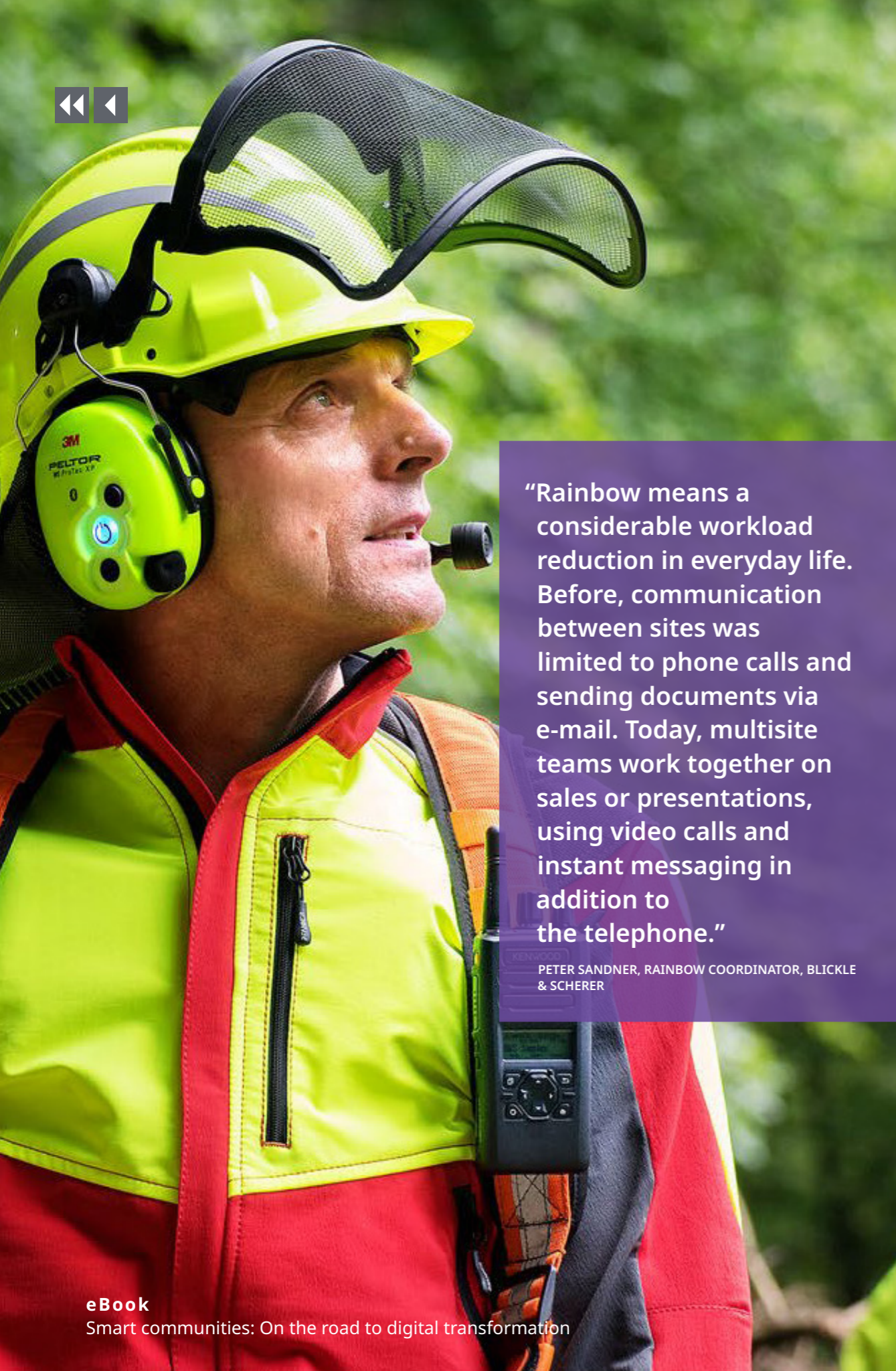
More than just a secure WhatsApp alternative

Discover Rainbow, the secure messenger service for public services, administration and schools. With Rainbow you get a secure, GDPR-compliant messenger alternative with end-to-end SSL encryption, all without a mobile phone number — for use with Android, Apple® and Microsoft®. You can use WebRTC telephony and video or hold conferences. Rainbow ensures that communication takes place securely, whether it's between schools, teachers, classes, parents or students:

- Communicate individually or in groups using chat, video, or IP telephony
- Automatic notification with push messages or news feeds
- Send priority-based mass alerts in the event of danger, fire or other hazards



**Ensure operational continuity with remote working.
Try Rainbow!**



Public safety digitalisation: Blickle & Scherer adopt a cloud- based solution that supports collaboration under strict safety and data protection standards

“Rainbow means a considerable workload reduction in everyday life. Before, communication between sites was limited to phone calls and sending documents via e-mail. Today, multisite teams work together on sales or presentations, using video calls and instant messaging in addition to the telephone.”

PETER SANDNER, RAINBOW COORDINATOR, BLICKLE & SCHERER

Blickle & Scherer work primarily with public authorities responsible for public safety and emergency services, providing reliable private mobile radio communications to transport companies, energy suppliers, as well as renowned industrial enterprises and service providers. Employees must undergo strict security checks by the Ministry of the Interior of the federal state of Baden-Württemberg. For security reasons, and to comply with GDPR, the use of consumer instant messaging and VoIP services is prohibited.

Blickle & Scherer wanted to **provide employees with modern Unified Communications (UC) platform functions**, such as presence information, instant messaging, image sharing, document sharing and collaborative working in the cloud. The objective was to improve communications and collaboration between the company's six sites.

[Read the full success story](#)





Solutions for smart mobility

Reduce congestion and energy use with smart mobility:

Cities and urban regions around the world are facing increasing pressure on commuter systems, from road transportation, to airport systems, to railway systems. Congestion is taking a toll on regional economic competitiveness, fuel use and the environment. The right network infrastructure solution lets you scale your resources to meet demand, with the agility required to handle anything that rush hour can throw at you.

New technologies can make daily operations faster and less expensive. For example, Power over Ethernet (PoE) simplifies device and sensor installation by eliminating wiring in hard-to-reach places. Centralised provisioning and automated deployment help operational personnel set up and start working fast. And, integrating a Communications Platform as a Service (CPaaS) solution with business processes to provide communication and collaboration services between different stakeholders is vital in this fast-moving mass transit industry.



Learn how you can ensure public services continuity



FREE
WI-FI



Connect to:
TransitWirelessWiFi

“Thanks to the Alcatel-Lucent Enterprise solution, more than 330,000 users access free Wi-Fi in the New York subway every day. We’re always moving the technological needle forward and have plans to increase bandwidth and quality, while monetising the network. ALE USA is proactive in proposing new products that will help us achieve these goals. We look forward to continued cooperation and mutual success.”

THOMAS MCCARTHY, DIRECTOR OF NETWORK OPERATIONS, TRANSIT WIRELESS

How the New York Subway provided free Wi-Fi connectivity to commuters

The project was awarded the IDC Smart City Awards for Digital Equity and Inclusion in 2018.

The network that brings smart city technology to the city’s underground subway system is a Transit Wireless project. Transit Wireless was licensed by the Metropolitan Transit Authority to design, build, operate and maintain the cellular and public Wi-Fi connectivity in New York City underground subway stations. Construction began in 2011, and the project was completed an unprecedented two years ahead of schedule on January 1, 2017. Based on a public-private agreement with Transit Wireless, MTA and carrier partners, the estimated \$350 million USD infrastructure project was implemented at no cost to taxpayers.

The network operates across all 282 underground stations with a 160+ mile long fiber-optic backbone, connecting to five highly secure base station data centres with more than 7000 antennas system-wide.

ALE ruggedised switches handle the large volume of traffic with more than 500 terabytes of data per month, under extreme environmental conditions. In addition, the switches work seamlessly across networks that provide services to AT&T, Sprint, T-Mobile and Verizon Wireless customers.

[Read the full success story](#)

Transit)))
Wireless
a bai communications company



“This tunnel is designed to last for 100 years. I am sure that the Alcatel-Lucent Enterprise colleagues will manage it successfully. They had the last 8 years well under control. They will continue for the next 92 years, or longer. We are also very proud of the AVA Digital award and Muse Creative Award won by Koenigsfilm for our video promoting the partnership between Gotthard tunnel and Alcatel-Lucent Enterprise.”

PETER HUBER, PROJECT LEADER, TRANSTEC GOTTHARD

Saint Gotthard Tunnel: Enabling secure connectivity in challenging environments

With 152 kilometers of track, including 168 cross passages that run through the Swiss Alps, the Saint Gotthard Tunnel is the longest and deepest traffic tunnel in the world.

A web of IoT devices (door monitoring, sensors, cameras, ventilation and drainage infrastructure, communications, and control and monitoring systems), depend on real-time data transmission to manage passenger and vehicle safety 24/7 in an extremely challenging environment, including temperatures up to 40°C+ and over 70% humidity.

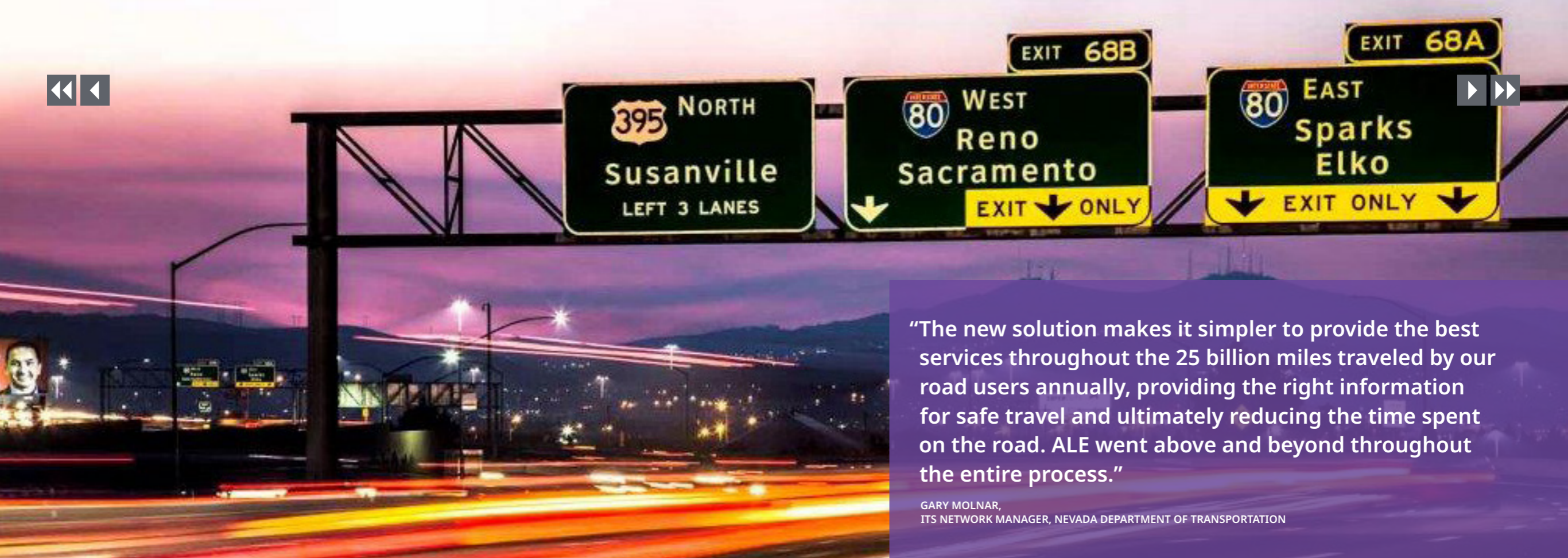
It was critical that the entire tunnel be connected and secured with IP network connectivity as even minimal

network disruption could cause delays and potentially impact worker and passenger safety.

The Alcatel-Lucent specialised hardened network, based on 1000 Alcatel-Lucent OmniSwitch® 6855 Hardened Ethernet LAN Switches, takes IoT where standard networking cannot. The extreme stability and reliability ensures automatic transmission of essential operational data for the tunnel’s 70,000 data points and guarantees the level of service necessary to ensure the safety of 9,000 passengers every day.

[See the full success story](#)





“The new solution makes it simpler to provide the best services throughout the 25 billion miles traveled by our road users annually, providing the right information for safe travel and ultimately reducing the time spent on the road. ALE went above and beyond throughout the entire process.”

GARY MOLNAR,
ITS NETWORK MANAGER, NEVADA DEPARTMENT OF TRANSPORTATION

Nevada Department of Transportation (NDOT) prepares for next generation Intelligent Transportation System (ITS)

The project is a finalist of the 2020 IDC North America Smart City Awards.

NDOT’s primary objective is to increase safety on the state’s roads by offering drivers real-time information on road, traffic and weather conditions.

A new hardened data network can withstand the harsh Nevada climate and support a growing number of devices offering:

- Simplified connectivity and management for the growing mesh of IoT devices, including IP cameras, next generation sensors, status notification systems, and connected cars

- Real-time data for drivers to plan their journeys safely
- Remote management, including rebooting devices which generates time savings and frees personnel to focus on other mission-critical tasks

[Read the full success story](#)





Your digital transformation partner

[Alcatel-Lucent digital government solutions](#) connect communities, agencies and businesses to support digital transformation. They help simplify user experience, secure IoT and user connectivity and anticipate emergencies. Architectural flexibility ensures that local communities can evolve with a secure system that complies with GDPR and data privacy regulations:

- **Secure and resilient systems:** Network security provided at all levels (from core to access) to protect real-time communication systems and ensure confidentiality
- **Flexibility:** Deploy and evolve at your own pace. Quickly and easily upgrade existing network and communication capabilities and optimise your budget with innovative, operating expense (OPEX)-based communication deployment options.
- **User experience:** Easy-to-use solutions from deployment, to administration, to use. Focused on customer welcome, mobility and collaboration without borders.
- **Simplified integration:** An open system makes it easy to integrate custom communications, or IoT-enabled processes, with user-oriented mobile, or Web applications

Contact us

Send your enquiry to:
enterprise.solutions@al-enterprise.com



We are Alcatel-Lucent Enterprise.

We make everything connect by delivering technology that works, for you. With our global reach, and local focus, we deliver networking and communications.