DYNAMIC COMMUNICATIONS FOR STATE & LOCAL GOVERNMENT

Building Smart Communities for a sustainable future

Alcatel·Lucent

Smart Communities – where government, public services, businesses and citizens can communicate and interact effectively in real time – will ensure a prosperous, sustainable 21st Century. This is especially true given today's exploding demand for connectivity, higher service expectations, global competition and the necessity to squeeze more value from municipal budgets.

Building a Smart Community begins with an advanced Ultra-Broadband and IP network infrastructure that enables optimized public operations, connected communities and enriched citizen services. Its enterprise-wide approach allows multiple public departments to fully leverage all network resources, increasing flexibility and secure operations at a lower total cost. The result is a cutting-edge communications platform for economic development and a better quality of life for everyone; a foundation for a sustainable future.

OPPORTUNITIES FOR THE COMMUNITIES OF TOMORROW

The challenges facing today's communities are unprecedented and complex, impacted by rapidly growing urban populations, stringent environmental regulations and greater citizen expectations. In the face of these trends, state and local officials must deal with expanded political responsibilities handed down from central governments, along with heightened security risks, aging infrastructures and increased global competition from other urban centers. They also must ensure sustainability, economic growth, reliable services, enhanced connectivity, convenient public transportation, recreational options and educational opportunities – all the while dealing with budget realities that ask them to do more with less.

Fortunately, state and local governments have a unique opportunity to turn these challenges into benefits – becoming Smart Communities that leverage information and communications technology (ICT) in every aspect of their operations. With broadband transport, data sharing, analyses, automation and rich, high-speed communications available everywhere, instantly and at any time, Smart Communities can innovate, make the best decisions at the right times, reduce costs through IT resources virtualization, and even increase revenues by providing enhanced communications capabilities to their citizens, business communities and neighboring jurisdictions.

The road to becoming a Smart Community starts with Alcatel-Lucent's Dynamic Communications infrastructure, the strategic asset for thriving in this new millennium of global urban growth. Dynamic Communications optimizes government operations and with a cutting-edge platform for economic development that deepens the tax base and improves quality of life. It connects municipalities and agencies for highly efficient shared services, and engages as never before with mobile and connected citizens using digital apps, allowing them to contribute to the innovative, sustainable future of their city.

Broadband, the "fourth utility" after gas, electricity and water.

Cities account for:

2%
OF THE EARTH'S LAND

70%
OF ENERGY CONSUMPTION AND CARBON EMISSIONS

53%
OF THE GLOBAL POPULATION

By 2020:

18 billion
CONNECTED M2M DEVICES TO REACH

x3
THE NUMBER OF PEOPLE OVER 60 YEARS

70%
WILL BE URBANITES

THE CRITICAL ROLE OF COMMUNICATIONS IN GOVERNMENT

Information and communication technology (ICT) can optimize government operations and boost sustainable social, cultural and economic development. The new-generation Ultra-Broadband network based on IP/MPLS will be the transformative core component for building Smart Communities. Alcatel-Lucent's Dynamic Communications infrastructure is designed to power this new era of urban and rural area management and to set the foundation for regional, national mutualization and international cooperation. With higher levels of efficiency, carrier-grid reliability, security, interoperability and advanced services, it immediately creates a positive impact that touches all aspects of the Smart Community, providing:

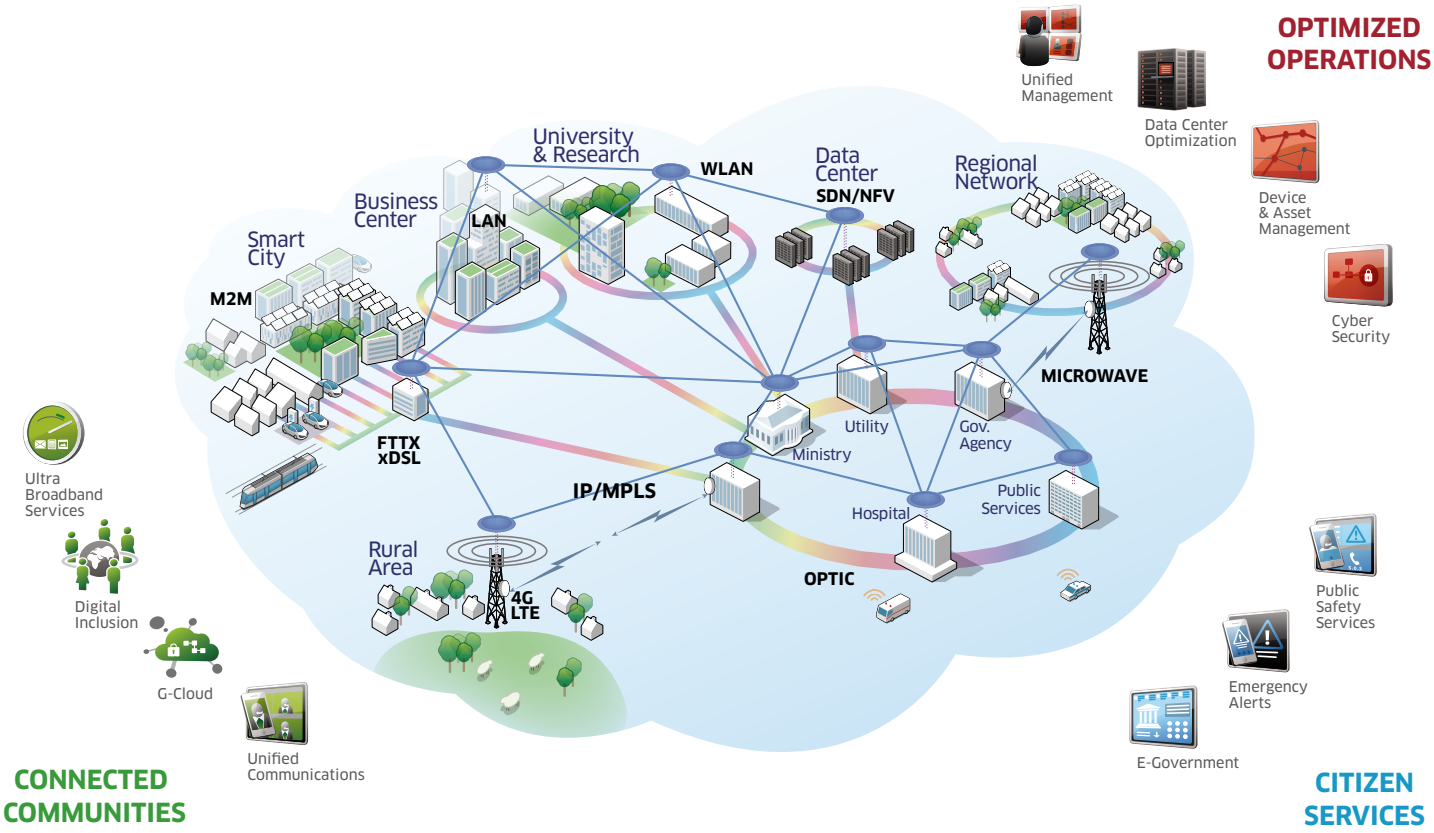
- **Optimized operations:** A city-owned single Ultra-Broadband network serves multiple public agencies, cutting down ICT overhead while keeping each department in control of its own dynamic pool of resources. This allows more to be done with less. With Alcatel Lucent's Dynamic Communications, data centers are shared and optimized, annual leased line costs are dramatically reduced or eliminated and broadband interconnection points with service providers are consolidated. Fiber optic resources are utilized more efficiently, with excess capacity dedicated to enhancing citizen services or generating additional revenues. IT staff from multiple departments that may have been performing duplicate tasks are re-assigned to other projects, and cyber-security is improved at all levels of the network.
- **Connected communities:** Ultra-Broadband helps public authorities flexibly scale capacity and performance to bring advanced services to state and local government jurisdictions. The same infrastructure can also be utilized to offer "digital inclusion" to rural areas – extending high-speed access to information, education and economic

“We realized that we needed to orchestrate everything the city does to keep from repeatedly spending the same dollar when the same amount of money could have been dedicated to solving multiple issues.”

ARK KEIL, CIO, CITY OF CHATTANOOGA, TN, USA

opportunities to underserved and unserved communities. G-cloud capabilities radically streamline service procurement, efficiently interconnecting administrations, reducing silos, and saving costs. Community and public safety services are enhanced, providing a single point of contact for critical operations and emergency response.

- **Enriched citizen services:** Cities, regions and nations are increasingly challenged by major threats caused by nature, industry and technology, by deliberate and malicious CBRN events or even by military action. To save lives and limit damages, cell broadcasting for early warning provides, upon detection of a major threat, geo-targeted, real-time and context-aware messages to a population at risk. In everyday operations, eGov services for citizens and businesses help achieve better governance with bi-directional interaction, reducing administrative burden and increasing transparency. The simplified processes and real-time dialog facilitate active citizens and businesses participation in key public issues and initiatives.



OPTIMIZED OPERATIONS

Regional and urban areas heavily rely on communications networks to operate government agencies, manage essential services and connect with partners and other jurisdictions. A single multiservice Ultra-Broadband network supports different types of traffic with unified management that dramatically simplifies operations and helps improve efficiency. It allows the integration of any type of high speed data, video and voice services when required, with less total cost to the jurisdiction.

- **Unified network management** of all agencies and offices on a common IP/MPLS network benefits Smart Community operations. Alcatel-Lucent's Dynamic Communications includes service-aware management systems with graphical user interfaces that automate and simplify provisioning, monitoring and troubleshooting of network resources. Managing Quality of Service (QoS) functionality, the team can assign the highest priority to any mission-critical service requiring specific attention, such as public safety data flows (police, fire, and ambulance). By aggregating budget expenditures and resources, the single converged network makes higher performance and efficiency possible, is resilient in emergency situations, can accommodate rapid growth and can serve as the backbone for a regional public safety or a broadband access LTE network.
- **Data center optimization** uses new technologies such as virtualization and cloud computing to achieve better economies of scale and improve resource utilization, reducing CAPEX and OPEX. However, the creation of such powerful, on-demand, and highly scalable data centers is increasingly placing pressure on legacy networks, which struggle to keep pace with modern compute architectures and can impede the upgrade process. For cloud services to thrive, the networks within and across data centers must evolve to become as virtualized and readily available as

"The beauty of this network design, as we move into the future, is that it's going to be a single architecture that we can leverage."

DOUG HODGSON, CHIEF INFORMATION OFFICER, CITY OF CALGARY, CANADA

the computer infrastructure. Software Defined Networking (SDN) is the key to doing this, incorporating the tools of cloud computing and virtualization as applied in the data center to deliver similar benefits of speed, flexibility and elasticity to the network. SDNs create agility, allowing operators to define their requirements in application terms without being burdened by network implementation details.

- **Device and asset management** across both wired and wireless networks through a centralized operations center allows Smart Communities to keep all resources operating more efficiently with streamlined provisioning, device configuration, registration troubleshooting and monitoring. Administrators can get new services and applications up and running quickly, reacting as necessary to new opportunities and unexpected events, and can support "bring your own device" (BYOD) policies, boosting overall efficiency and lowering the total cost of ownership.

- **Cybersecurity** is a holistic solution set for preventing and detecting vulnerabilities, protecting systems, responding and recovering when dealing with cyber threats. A Smart Community's critical services and economic vitality are ensured through hardened and secured networking products, advanced end-to-end security integration and, optionally, a threat management center (SOC). Alcatel-Lucent's dynamic and robust network architecture and applications extend BYOD to the mobile environment. Network access control (NAC) allows administrators to set levels of authentication, authorization, visibility and control for individual network users and sub-administrators. Other capabilities such as VoIP security support secure, non-disruptive, toll-grade quality of service (QoS) for voice services. Alcatel-Lucent's outstanding networking and security expertise, independent security monitoring and control, unique technologies and product-agnostic approach, based on a best-of-breed partnership ecosystem, can be adapted to any customer situation.

"The digital divide does more than deprive Internet to the disadvantaged. It affects the way businesses and the economy develop."

MATTHEW COON COME, GRAND CHIEF, GRAND COUNCIL OF THE CREES, CANADA

CONNECTED COMMUNITIES

The network has never been as important as more and more communities decide to collaborate on services. In fact, it has become the basic infrastructure for jointly leveraging the assets of connected communities in much the same way as electricity, water and roads. Once connected through Dynamic Communications, Smart Communities collaborate as never before on innovative and effective programs to improve both quality of life and sustainability.

- **Ultra-Broadband** provides government ICT departments with the flexibility and scalability to deliver advanced e-services to partners and neighboring jurisdictions. Alcatel-Lucent Ultra-Broadband solutions fully meet the skyrocketing demands for multiple simultaneous services and users without compromising performance. They can increase the speed and reliability of the network with high-capacity fiber and copper access options, as well as with the latest mobile technologies such as FTTx and 4G LTE. These same Ultra-Broadband networks also feature rich communications capabilities for transportation and triple-play services (data, TV and phone). For situations where fiber to the home (FTTH) is not immediately feasible, Alcatel-Lucent's VDSL2 Vectoring solution presents a strong interim alternative, delivering up to 100Mbps on existing DSL lines. In fact, numerous broadband targets subject to a 2020 deadline will require a mix of fiber, DSL, and wireless meet the schedule. Alcatel-Lucent helps analyze existing assets and the business case to identify the optimal mix for any situation.
- **Digital inclusion** takes the concept of connected communities even further, extending access to information, public services such as education and economic opportunities to all, regardless of their location. Alcatel-Lucent makes communications more sustainable, affordable and accessible by delivering fiber-to-the-most-economical-point and utilizing the latest advances in wireless technologies (4G LTE, LTE Advanced).
- **Government-cloud (G-Cloud)** radically streamlines service procurement, supports self-service access to computing resources and boosts elasticity to accommodate peaks and valleys in demand in order to produce economies of scale for ICT cost savings. Alcatel-Lucent's Government-Cloud Enablement Platform is a dedicated Infrastructure as a Service (IaaS) in an open government environment, securing and sharing common digital assets with unprecedented control and customization – along with government application marketplace products and operational models such as cloud services, SaaS, open data, and more.
- **Unified communications** allow government personnel to communicate more effectively, creating a dynamic and mobile workforce that reduces the impact of commuting on the environment. They increase citizen, partner and staff satisfaction with enhanced response time and greater access to the overall knowledge of activities in agencies serving the Smart Community.

ENRICHED CITIZEN SERVICES

Enriched citizen services are essential components of Smart Communities. Alcatel-Lucent's Dynamic Communications infrastructure not only streamlines the daily management activities at city hall, but also allows officials to more effectively address the needs of their constituents through information-rich, seamless and convenient e-government, e-health and educational services, as well as advanced emergency alert systems.

- **e-Government services** for citizens and businesses are key to achieving better governance and bi-directional interaction in order to enhance efficiency with reduced administrative burden. Alcatel-Lucent's Dynamic Communications for State and Local Government boosts transparency and simplifies processes with facilitated inter-agency operations, ease of communication and sharing of public information to citizens and businesses. eServices engage government with those it serves, transitioning passive to active information access for citizen and business participation, representation, getting out the vote, consulting and other involvement.
- **Emergency alerts** help protect lives and goods at risk from major hazards caused by industry (e.g. flooding, fire of toxic material at industry plant or transport accident with toxic material), by nature or by deliberate and malicious terrorist acts. Alcatel-Lucent's Early Warning Cell Broadcasting solution saves lives and limits damages by providing government-initiated, geo-targeted, real-time and contextual messages to mobile handsets of populations at risk.
- **Public Safety Services:** Video surveillance might complement public safety operations through the use of Ultra-Broadband networks. They have the ability to backhaul IP video streams from fixed cameras, deployed through the city or region, or even to transport IP video surveillance from mobile cameras or viewing devices connected to the LTE network.

"By delivering a new network and data center, Alcatel-Lucent will enable us to streamline government processes between central and rural divisions and provide a consistent external view. This is an important step toward realizing the vision of giving our people access to a range of critical services how and when they need them."

WILLIAM TEVIE,
DIRECTOR GENERAL OF NATIONAL INFORMATION TECHNOLOGY AGENCY (NITA) OF GHANA

"In the long term, our needs are met by the responsiveness of the Alcatel-Lucent teams on functional changes and the overall management of the network."

YANN HELARY, CHAIRMAN OF GIGALIS JOINT VENTURE

PARTNERING WITH STATE AND LOCAL GOVERNMENTS IN EVERY STEP OF THEIR TRANSFORMATION

The ability to partner with state and local governments in every step of their transformation is one of the main reasons Smart Communities around the world have chosen Alcatel-Lucent. Our global team of experts uses proven processes and tools to mitigate risk and reduce costs in multi-technology environments – from the earliest planning stages right through to network integration and operations.

A network consolidation project of this magnitude and impact can be a daunting task that demands a knowledgeable, proven partner. Alcatel-Lucent's Bell Labs business modelling teams, including expert network architects and designers, can analyze your current and future total cost of operations (TCO) and required funding in a collaborative, step-by-step approach that delivers assured success in building a Smart Community for a sustainable future.

"We've had a good relationship with Alcatel-Lucent for over 15 years. The collective knowledge and support within the Alcatel-Lucent organization was quite significant. They understood our overall vision."

VIN BHOLA, IT PROJECT MANAGER,
CITY OF CALGARY, AB, CANADA

SMART COMMUNITIES

NETWORK TRANSFORMATION MODEL

LEARN
Alcatel-Lucent network architects work side by side with city and departmental staff to understand network challenges.

ANALYZE
Bell Labs business economics services determine optimal network architecture.

DEPLOY
Alcatel-Lucent deployment services using Bell Labs patented methodologies ensure network is deployed in an efficient manner and functioning as designed.

MANAGE
Alcatel-Lucent Global Network Operations Center (GNOC) services remotely monitor the health of the network and provide a dashboard for real time network performance feedback.

Whether your community is home to 50 thousand or 50 million people, Alcatel-Lucent will be your reliable partner in creating a cutting-edge Ultra-Broadband and IP network infrastructure – one that supports existing and future services that will create your optimized, connected and enhanced Smart Community.

MIGRATE
IP/MPLS backbone buildout allows legacy network services to be carried on converged network.

INNOVATE
With converged broadband network in place, Smart Communities leverage the network to offer innovative services to citizens and employees.

SMART COMMUNITIES FOR A SUSTAINABLE FUTURE

To meet the needs of state and local governments, Alcatel-Lucent acts as the comprehensive end-to-end provider to design, integrate, deploy, operate and maintain dynamic communications solutions designed to transform the future of Smart Communities. Alcatel-Lucent understands the challenges and requirements of serving all stakeholders in urban areas, and brings its accumulated expertise in the customization of Smart Communications systems to each project.

With IP networking and Ultra-Broadband solutions that reliably and efficiently interconnect all types of fixed and mobile communication networks, Alcatel-Lucent equipment is now enhancing operations and services in Smart Community networks around the world, while Bell Labs innovations will continue to reshape public sector networks in the future.

With operations in more than 130 countries and one of the most experienced global service providers in the industry, Alcatel-Lucent is a local partner with global reach.

www.alcatel-lucent.com/smart-communities

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