Utility community broadband

NOKIA

Enhancing utility business and community prosperity through gigabit broadband service

Broadband brings to utilities an opportunity to enhance their business with new service offerings that transform them to new business models while making a significant impact on their communities. Broadband internet access is essential for communities looking to prosper in today's connected global economy. Nokia's broadband fiber solutions help utilities provide citizens and businesses in underserved areas with gigabit service access, placing them among the world's elite communities. Broadband supports the improved economic development, education, and telemedicine opportunities that enhance quality of life while attracting and keeping jobs. It also provides the communications foundation for reliable, efficient smart grid electric services that bolster a community's economic development platform.

Nokia's proven end-to-end Fiber to the Home (FTTH) broadband gigabit solution enables voice, data, and IPTV services along with smart meter communications. Combined with Nokia's professional services expertise and experience, it bridges the digital divide, enabling utilities to deliver the socioeconomic benefits of broadband to their communities.

The challenge

Broadband internet access is a given in today's major metropolitan areas, providing citizens with a new kind of superhighway that drives commerce, supports superior education and healthcare, builds economic prosperity, and enhances quality of life. However, many areas still saddled with "last millennium" communications technology face being left behind.

Support economic growth

Many rural areas and smaller municipalities already have witnessed a steady exodus of people looking elsewhere for job opportunities. These communities may continue to shrink and flounder unless they are able to attract new businesses while retaining and nurturing the companies that already reside in the area. Broadband is key to building a strong and attractive communications platform that will allow businesses to compete on a global level, draw high-tech employees by replicating the business broadband experience in their homes, and attract new businesses with reliable communications and power.

Enhance entertainment, education, and healthcare

Increasingly, citizens have come to desire and expect cutting-edge digital entertainment options and the quality-of-life amenities that stem from such services as video-enhanced education, distance learning, centralized records, and telemedicine. Communities wishing to remain attractive to new generations of residents must be able to offer the broadband communications services that support these benefits.

Ensure public safety

Local government officials must ensure the highest standards in public safety, which include interoperability among multiple jurisdictions, agencies, educational institutions, and healthcare providers, along with smart policing, enhanced situational awareness, and the latest advanced public safety applications. Establishing high-speed broadband is critical to success in each of these high-priority missions.

Leverage smart grid technology

Electric utilities face the challenges of making their distribution grids smarter, more reliable, and capable of supporting renewable power sources while cutting demand peaks and thereby reducing supply costs—all capabilities that add to a community's economic value proposition to create a powerful magnet for new businesses. And broadband communications can be leveraged to support smart grid technology while consumer services generate the revenue needed to quickly recoup the broadband investment.

"The legacy of the rural electric cooperatives is that of bringing vital utilities to underserved communities. In the 20th century the need was for electricity and today the need is for high-speed, high-capacity broadband. Providing access to broadband will attract jobs and investment, improves lives through services like telemedicine and e-learning, and allows families to stay in the communities they love. When we first started looking at the scope of the broadband project, we knew we would need to rely upon expertise that we did not have. Fortunately for us, Nokia demonstrated both their ability and also a strong desire to help bring broadband to northeastern Oklahoma."

Sheila Allgood, Bolt Fiber Optic Services
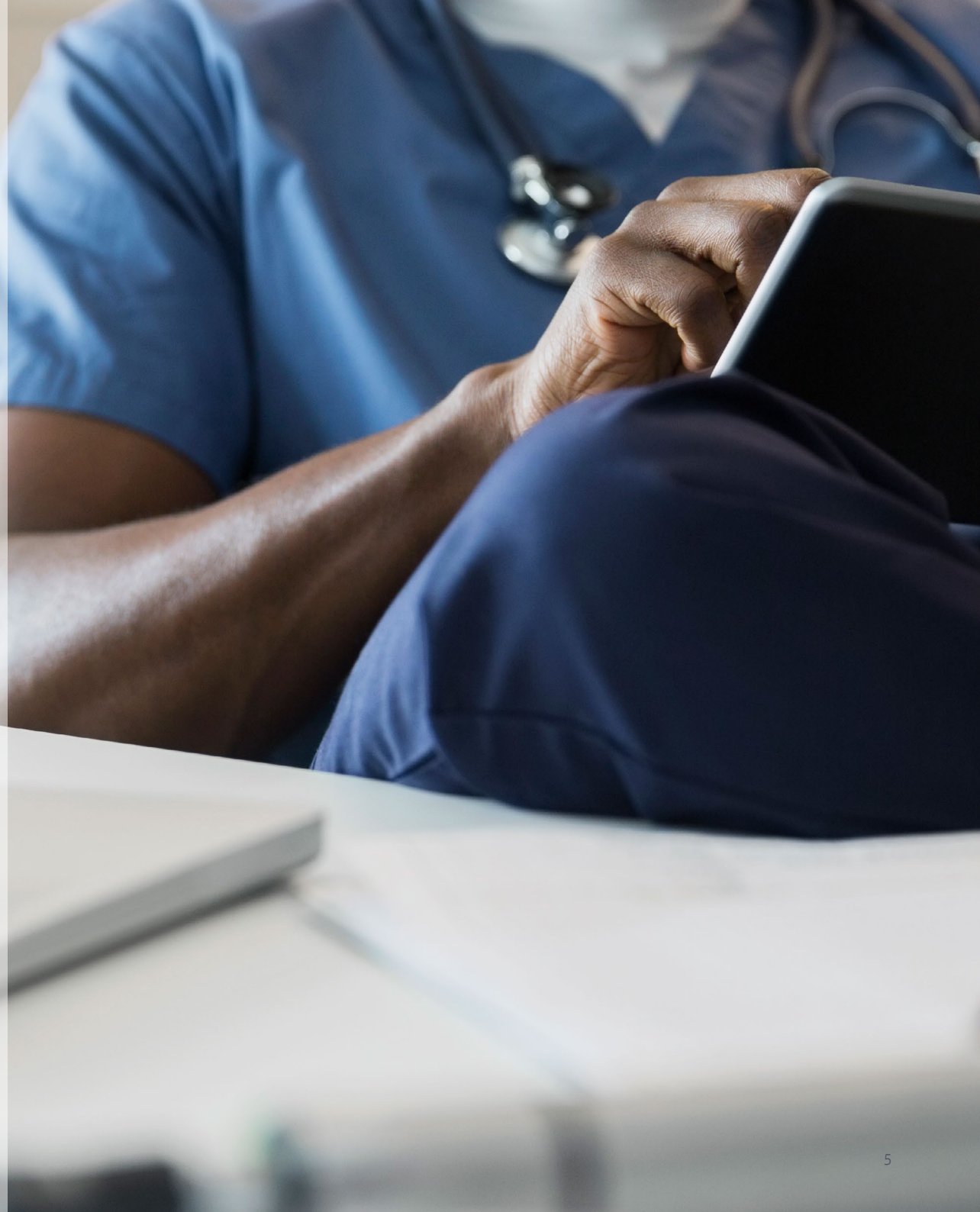
Nokia's solution

The good news for rural areas and smaller municipalities is that broadband is within reach—especially when fiber to the home (FTTH) infrastructure is leveraged to support both utility and consumer services. Nokia's end-to-end solution provides gigabit broadband access so that local citizens and businesses can join a group of the world's most connected communities. Cutting-edge consumer services include a triple-play solution with voice, data, and IPTV.

In Opelika, Alabama, a gigabit FTTH network originally conceived for the municipal power utility, Opelika Power Services, already is generating millions in triple-play revenue and expects to earn back its investment in less than five years through service to 5,000 customers.

Dalton, Georgia's Optilink subsidiary currently provides over 12,000 customers in five counties with the region's only fiber-based broadband telecom services, which bring in about $19 million annually.

The Northeast Oklahoma Electric Cooperative's Bolt Fiber Optic Services is supplying 9,000 rural members with an end-to-end triple-play solution and gigabit broadband connectivity, placing them in an elite group of communities around the world with super-fast internet access.

Residents of smaller communities like these can stay in the places they love, build their businesses, attract new industry, and preserve multi-generational family traditions—all while enjoying a better quality of life.

Broadband gigabit service delivery architecture
Broadband services support

GPON	Gigabit Passive Optical Network
OLT	Optical Line Terminal
ONT	Optical Network Terminal
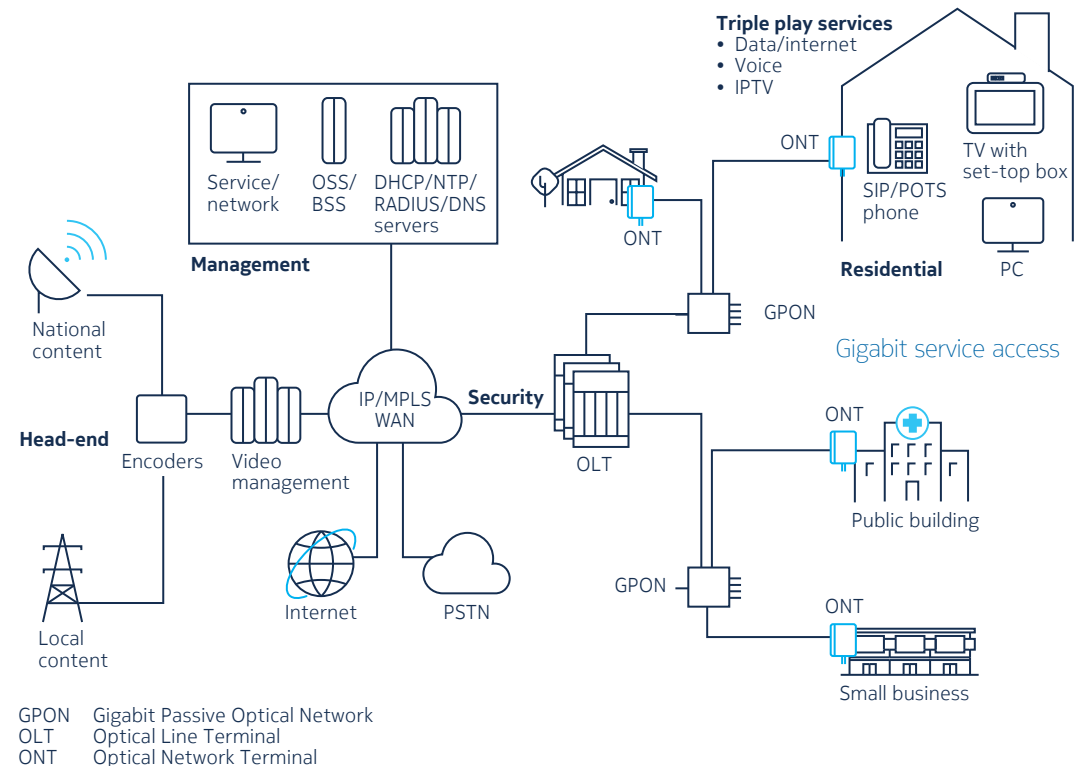
This Nokia utility broadband solution architects and deploys all the elements needed by a utility to become a Telco service provider. Through these services, utilities can leverage extra value from their market presence and assets.

Once the fiber is deployed, utilities can add 21st-century intelligence to their electrical grids, ensuring mission-critical bandwidth, priority, and reliability for operational applications that include distribution automation and substation automation as well as teleprotection, the seamless integration of renewables, and smart metering for effective demand management. Consumer services include a quad-play solution with voice, data, IPTV, and smart meters for demand management.

Operational benefits

The gigabit solution will provide network capacity that is future-ready, safe, and easy to operate, designed to meet user requirements for decades to come.

- **Fast, economical operations:** The Gigabit Playbook and associated services allow utilities to rapidly deploy services, saving time and money. Industry-proven tools and processes eliminate risks, especially if operators don't have expertise in broadband.

- **Complete, effective management:** One of the most critical components of a highly functional broadband network is a full set of management tools and capabilities to acknowledge, interrogate, and resolve issues immediately, addressing network problems before they can impact operations. Nokia offers industry-leading tools that simplify the management of complex networks while providing statistics and billing information that reduce costs.

- **Unmatched security:** Network security is critical for ensuring that services are reliably delivered with protection from potential threats and vulnerabilities, including uncontrolled or unauthorized peer-to-peer connectivity, theft of service, and denial-of-service attacks. To accomplish this, security elements from multiple vendors must work together seamlessly. Having designed and deployed hundreds of mission-critical security solutions for networks around the world, Nokia offers a superior understanding of what is required, offering a consolidated solution architecture that protects every aspect of the network.

Broadband gigabit service delivery architecture
Broadband services and utility operational applications support

GPON	Gigabit Passive Optical Network
OLT	Optical Line Terminal
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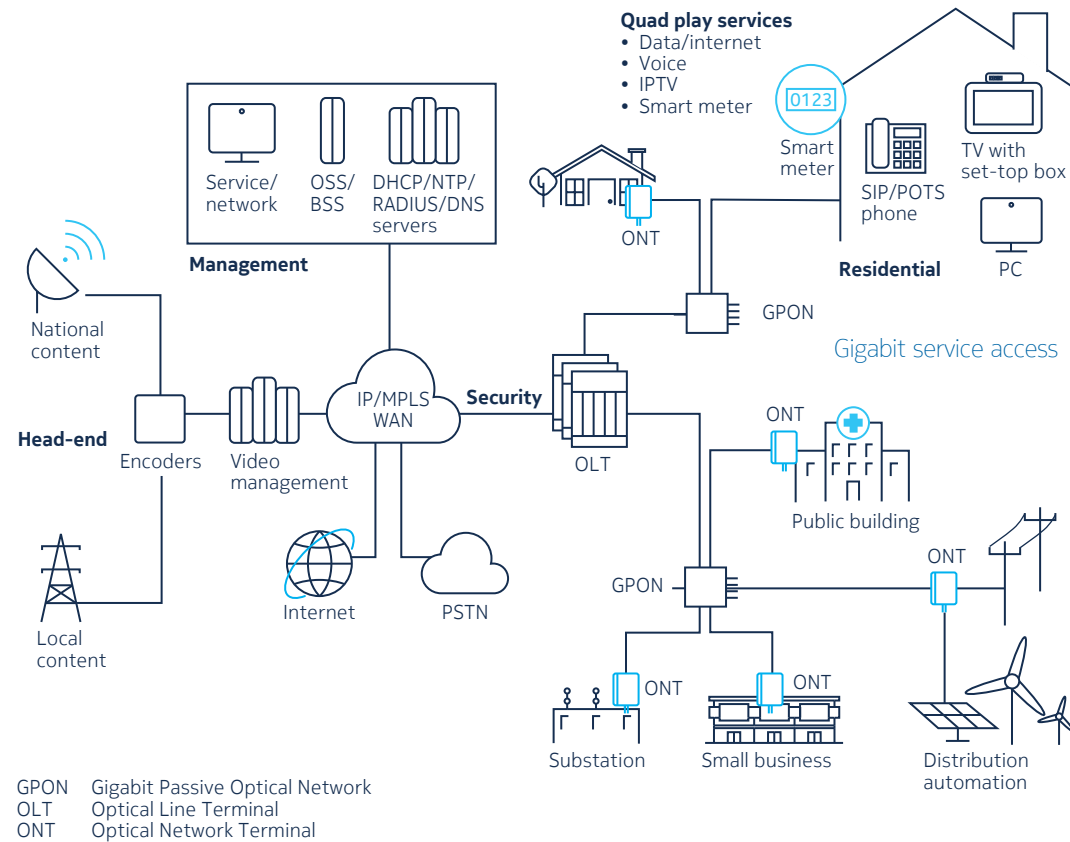
In July 2012, a summer storm affected EPB Chattanooga's electricity network. Thanks to their smart grid, enabled by their fiber broadband network, the utility had a 55 percent reduction in duration of outages and expedited restoration, saving EPB Chattanooga $1.4 million.
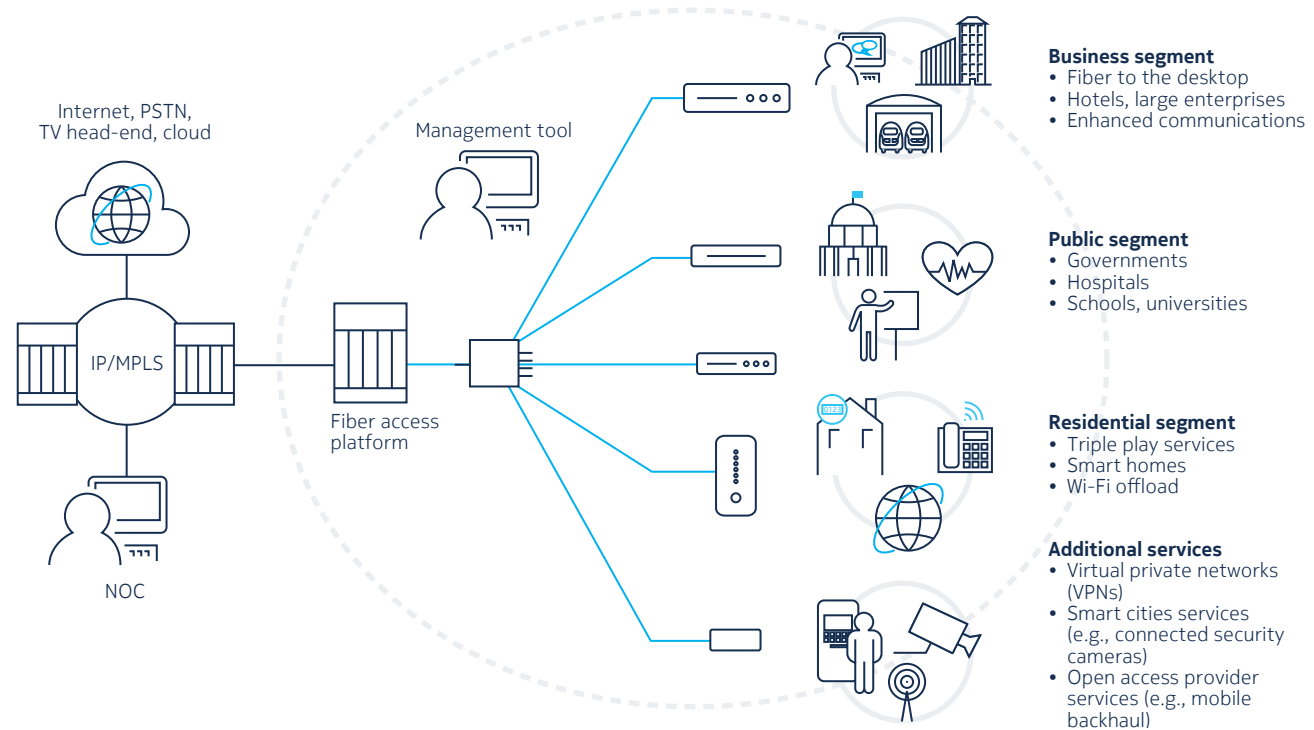
Broadband access is the great equalizer, promising to affect rural communities in the 21st century as much as roads and highways did in the 20th, without compromising their small-town qualities.
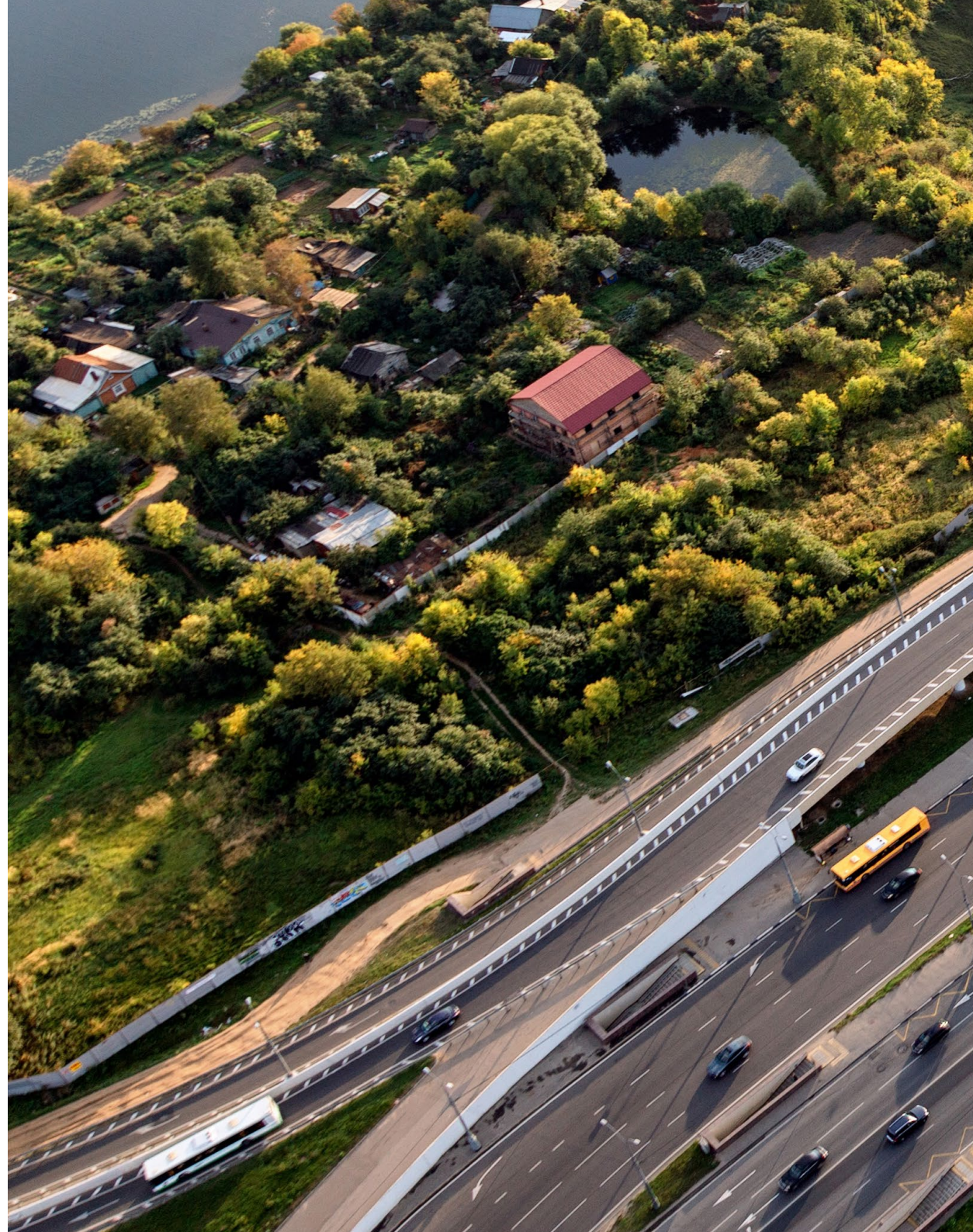
Solution details: the elements for success

Nokia's utilities solution has all of the building blocks to help utilities create for communities of any size a state-of-the-art gigabit network. It unifies products, services, and guidelines for faster and easier deployment, start-up, and operations. Its market-leading fiber access platforms (Nokia ISAM FX/ DF/ SF), end-user home devices (Nokia 7368 ISAM ONTs), and access network management system (Nokia 5520 AMS) are supported by an unmatched set of products and services:

- High-capacity platforms for anywhere deployments (indoor/outdoor, building basements, central office, data centers)

- The Gigabit Playbook guidelines, which show how to provision and operate the network, including predefined configurations and guidelines for testing and troubleshooting in order to rapidly get services up and running

- Bell Labs Consulting Services to help plan, design, and optimize each network for minimum cost and maximum return on investment

- Multiple access options—including passive optical network (PON) and point–to-point Ethernet—to best support specific applications.

- Complementary technologies: Fixed Wireless Access, G.fast and DOCSIS to optimize the business case.

Internet, PSTN,
TV head-end, cloud

Management tool

IP/MPLS

Fiber access platform

NOC

Business segment
- Fiber to the desktop
- Hotels, large enterprises
- Enhanced communications

Public segment
- Governments
- Hospitals
- Schools, universities

Residential segment
- Triple play services
- Smart homes
- Wi-Fi offload

Additional services
- Virtual private networks (VPNs)
- Smart cities services (e.g., connected security cameras)
- Open access provider services (e.g., mobile backhaul)

Electric Power Board (EPB) of Chattanooga

10Gig City Chattanooga won the **Most Innovative Gigabit Broadband Service award using Nokia fiber solutions**. This award recognizes the communications service provider (fixed, cable, utility, municipality) that has launched the most innovative Gigabit broadband service offering during the past year.

Leading Lights AWARDS 2016
Winner

Steps in building a broadband network

The transformative benefits of broadband are within reach for smaller municipalities and rural areas. So, where do you start? It's a step-by-step process.

1. **Create your vision:** Create a vision for where you want to take your network, whether it's triple-play only or one that also supports smart grid with additional revenue sources.

2. **Build your business case:** Evaluate your physical and information assets that can improve the economics of your deployment. Consider your choices of business and investment models and develop detailed numbers on the likely cost and revenues. Include the model that will enable self-funding as soon as possible and will be financially sustainable by attracting service and content providers. The business case can also include a what-if scenario (impact on your business if you don't build a network).

3. **Conduct a feasibility study:** Validate your business case by engaging an independent consultant to evaluate your particular marketplace. Use focus groups and local financial data to assure that your community will support the network you want to build.

4. **Create your network architecture and design:** Once you have validated financial aspects, consider the technology and high-level network design based on an efficient balance between cost and future demands. Take your requirements to RFP and select an experienced vendor that will help you execute your vision.

Now deploy your network with a solution that may initially include daily operations support from a partner—a model that will allow you to deliver an excellent level of service as your organization builds its broadband skill set and experience.

> "Much of our original motivation to do this had to do with economic development and competition for services so that the citizens can have good, affordable options."

David Horton, Director of Opelika Power Services

Business models: open access or retail?

When crafting your business plan, decide on whether to follow the open-access (wholesale) or full-retail model. With open access, the utility or a separate broadband entity owns the network infrastructure but partners with or leases to other companies to provide consumer services over the network. In the full-retail model, the utility or separate broadband entity provides broadband services to customers. There also are variations on both models, with the utility providing some, but not all, services. Your best way forward will depend on your resources, regulatory environment, and goals. Whichever model you choose, Nokia has the proven expertise to help you build and execute your plan.

Establishing a financial blueprint

This critical step in finalizing your business case identifies your funding sources. These can include bonds, loans, private investments, and grants by government agencies and programs such as the Rural Utilities Council and the Universal Service Fund in the United States. The more stakeholders you get on board with your plan— schools, hospitals, and major businesses—the more funding options and success you will have. Consider government regulations as you determine the best corporate entity for funding and operations. You may need to create a separate business entity to build the network, fund the loan, establish the business, and run the FTTH business. One size doesn't fit all, so consult with a good telecom lawyer who is familiar with the country and local laws to help create the best financial entity for your purposes.

The Nokia advantage

Creating a broadband network that will serve the community for decades requires an experienced partner with a track record of delivering successful solutions. Nokia is powering some of the largest and most advanced fiber networks in the U.S. and in the world, with more than 30 years of experience in providing communications for utility operations and local broadband providers.

- In 2008 Nokia built the first Gigabit and the first 10 Gigabit network in the United States for Electric Power Board of Chattanooga (EPB).
- Nokia is the number-one GPON vendor in United States, serving many municipal and cooperative utilities and the largest service providers.
- Nokia built the first GPON and universal next-generation PON.
- Nokia built broadband networks for several utilities in the Nordics.

No other supplier can match Nokia's breadth and depth of expertise and flexibility in providing solutions for broadband services to utilities.

Taking action

A number of rural and municipal utilities already have successfully transformed their communities' economic and social future with broadband. You can begin now. Talk to your peers and the vendor community. Go to webinars and seminars. Start to develop partners, and work with them to create references. Consider alternative solutions—look at wireless, fiber optics, or a combination of both. Consider the different skill sets that will be required for your transformation and look beyond the basics. Any community can reap the global socioeconomic benefits of broadband, so why wait any longer? It's time to get started.

Network with gigabit broadband access (100 times faster than the average connection speed in the United States) places a community in an elite group of communities around the world.

"Because Nokia has experience with other municipals in the same business, they've been able to give us help in developing our smart grid plans."

**Hank Blackwood,
Dalton Utilities/OptiLink**

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