Nokia Future X cities
Connecting cities to a more prosperous, sustainable and livable future
What does it take to realize the promise of the smart city?

City managers face unrelenting pressure to make their cities smarter so they can do more with less, launch new services faster, make life better for citizens and foster local economic development in a more sustainable way.

New technologies and business models are changing the rules of the game in key city outcome areas such as quality of life, public safety, transport, economic growth, job creation and core service delivery.

Mobile broadband, IoT, cloud and analytics technologies are critical enablers for smart city services. But it takes more than technology to deliver on the promise of the smart city.

Breaking free from point solutions

Many cities aren’t fully realizing their smart city vision because they have embraced a technology-centric approach. Driven by the needs of different city departments, they deploy point solutions aimed at adding connectivity and intelligence to improve existing services.

An approach built around point solutions has limitations. For example, it doesn’t address root causes or provide a complete solution to bigger problems that interlock several city domains. It adds complexity with each new solution, which limits scalability and interoperability. And it focuses attention on a few core city services.

To overcome these challenges and limitations, cities need to:

• Build an intelligent, shared and flexible technology platform that can support all types of smart city applications and services at scale
• Deploy solutions that will allow them to form partnerships and capture value from a diverse ecosystem of innovators
• Ensure that their chosen solutions can work together to facilitate collaboration that spans city domains

The key to success is to move away from point solutions and invest in platforms that can support a continuous and comprehensive transformation journey.
Turning cities into platforms for smart digital services

Nokia supports a “city as a platform” concept using a systems-level approach that allows cities to break down service delivery silos with solutions that address city-wide strategic goals. This approach centers on the Nokia Bell Labs Future X architecture for smart cities, a connectivity platform that can link and power a complex mix of city elements.

The Future X architecture harnesses technologies such as Industrial Internet of Things, edge computing, cloud, artificial intelligence, machine learning, augmented and virtual reality, high-performance networking and neutral host models to drive dramatic productivity improvements across a wide range of city sectors.

Powered by the Future X architecture, cities can begin transforming themselves into service creation platforms that:

- Work across multiple parties
- Share data and insights
- Enable continuous innovation
- Reuse technical capabilities created by third parties
- Facilitate the flow of information across city services
- Deliver impactful digital services at scale

Figure 1: Nokia Bell Labs Future X architecture for smart cities
Getting full value from digitalization

Cities that embrace this platform approach can maximize the social and economic value of digitalization by creating services at three different levels within their communities.

City operations

Cities already have numerous projects aimed at improving operational efficiency. Platforms can help accelerate this aspect of digital transformation by allowing for common data stores across operational systems, as well as sharing common back-office functions.

Public service creation and delivery

By working with third-party partners, cities can develop new ways to create and deliver public services such as transportation, education, social care, public safety and waste management. Enhanced services bring value to city agencies and citizens. Cities can mitigate their financial risk by financing services through public-private partnerships (PPPs) and enabling third-party partners to run them.

City-wide innovation and incubation

Continuous innovation generated by the private sector can help cities boost employment, fuel local economic growth and provide better services to citizens. A city can use its platform to provide secure, reliable, flexible and highly scalable connectivity for business and consumer services. It can also generate revenue by hosting services on its platform and providing access to its data. An innovation and incubation model also enables a city to shift from CAPEX-heavy to OPEX-oriented service delivery models.
Our Future X cities offer

We offer a comprehensive smart city portfolio supported by the Future X architecture. The portfolio includes four main technology solutions and a smart city practice that enable cities to address specific needs based on their strategic goals, priorities and initial situation.

**High-performance connectivity and neutral host**

This wholesale network platform enables cities to connect all communities and provides the basis for digital service delivery while optimizing CAPEX investment.

Key components:
- Community Broadband (FTTH)
- Mission-critical WAN for cities
- Nuage Networks SD-WAN
- Private wireless (LTE/5G)
- Multi-cloud architecture, including Edge Cloud (MEC) and Nuage Networks Virtualized Cloud Services

**City data management and analytics platform**

This platform uses data sharing and intelligent analytics to create valuable insights on the city ecosystem. It enables cities to combine data from different departments to gain a better understanding of their operations and increase their use of automation.

Key components:
- IMPACT IoT platform
- SpaceTime advanced analytics and IoT applications
- Integrated Operations Center (IOC)
- Datapace (data marketplace)

**Intelligent urban infrastructure**

This solution helps cities create IoT-based data marketplaces. It lets them turn urban infrastructure assets such as light poles and bus shelters into connected and smart devices by deploying mobile broadband and IoT devices in an unobtrusive and space-efficient manner. Cities can use these deployments to provide services to citizens and gather a wealth of IoT data that can be analyzed to gain a better understanding of the city ecosystem and improve response to events.

Key components:
- City connectivity platform (fiber, 5G wireless access, IP/MPLS WAN)
- IMPACT IoT platform
- SpaceTime scene analytics application
- Integration services

**Integrated city platform**

This solution provides a common, vertically integrated platform architecture that supports the delivery of diverse, cross-vertical citizen and city services. Drawing on our entire smart city portfolio, it powers the different elements of a city’s digital transformation, including:

- Connecting vast numbers of citizens to government and other service providers
- Connecting a large number of devices deployed across the city
- Underpinning financial transactions and other interactions with the city ecosystem
- Supporting exchanges of information with users and applications
Innovative business models and ecosystems

Cities need more than technologies to successfully transform themselves into smart cities. To deliver on their vision, they need to build a business case that defines a model for technology supply, financing and contracting, and a strategy for enabling city-wide innovation.

We address these needs with a smart city practice that helps cities work with a broad ecosystem of stakeholders and partners. This includes:

- Collaborating with global and local solution providers and contractors to create end-to-end solutions that deliver on specific expectations
- Working with investment funds to develop innovative financing schemes
- Supporting different contracting models, from standard models to as-a-service models through special-purpose vehicles (SPVs)
- Fostering city innovation through collaboration with leading innovation labs and the sharing of best practices among peers and the ecosystem

City-as-a-platform benefits

- Accelerate service creation by enabling continuous innovation.
- Break down silos that limit the impact of new services.
- Engage citizens and stakeholders more directly.
- Stretch limited resources with critical enablers such as broadband networks and digital platforms.
- Scale smart city projects by addressing the limitations of point solutions.
Why choose Nokia?

Work with a trusted government partner
Nokia has a long record of success in helping cities, public companies and nations reap the benefits of ubiquitous connectivity, analytics, cloud and the Industrial IoT. We offer deep experience and proven expertise in mission-critical communications and technology, business and service evolution.

We have worked with governments and public sector agencies for the past 60 years and support more than 500 government customers worldwide with our IP, optical, microwave and 4G LTE technology. In addition, we continue to help service providers, industries and enterprises move from legacy telecommunications systems to LTE and 5G networks.

Our references include the cities of Wrocław, Chattanooga, Sendai and Espoo, as well as Invest Ottawa and Yvelines Numérique.

Capitalize on the world’s most complete smart city portfolio
Our Future X cities solutions are built on the only end-to-end portfolio of best-in-class network equipment, software and services that’s available globally. We are not tied to specific technologies and can help cities deploy the right technology mix to optimize overall performance and get the most value from their investment.

We offer a one-stop shop that provides solutions for the entire city connectivity platform. This makes rollouts easier and simplifies relations within city-led consortiums. All of our technologies are based on open standards. This helps cities protect their investments and evolve their solutions to address future needs.

Achieve a comprehensive transformation by looking beyond technology
Our unique platform approach enables cities to use innovative technologies, financing, contracting models and ecosystems to make a comprehensive and scalable digital transformation. We use our proven solutions and deep transformation experience to help cities digitalize and automate critical processes at scale, drive significant gains in productivity and fuel economic and social growth in a sustainable way.

Let us help you
We’re ready to help you take a new and more cohesive approach to realize the full benefits of your smart city initiatives. Nokia Future X cities lets you combine a high-performance network with robust platforms that can use the intelligence in your applications and services to fuel economic and social growth.

Visit our website to learn more about how our Future X cities solutions can help you create innovative digital services that make your communities greener, more prosperous and livable.

Connecting a city to its future:
The smart city of Wrocław
See how we’re helping Wrocław, Poland build a platform for delivering citizen-centric digital services.
About Nokia

We create the technology to connect the world. Only Nokia offers a comprehensive portfolio of network equipment, software, services and licensing opportunities across the globe. With our commitment to innovation, driven by the award-winning Nokia Bell Labs, we are a leader in the development and deployment of 5G networks.

Our communications service provider customers support more than 6.4 billion subscriptions with our radio networks, and our enterprise customers have deployed over 1,300 industrial networks worldwide. Adhering to the highest ethical standards, we transform how people live, work and communicate. For our latest updates, please visit us online www.nokia.com and follow us on Twitter @nokia.

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