Best business outcomes with Nokia Network Planning and Optimization services

Accelerating efficiency, sustainability and ROI with AI-driven insights

Digital twin

NOKIA

Leveraging Network Performance Optimization for 5G transformation

The telecommunications industry is undergoing a significant transformation as Communication Service Providers (CSPs) strive to balance cost efficiency with the growing complexity of 5G networks. Modern technologies like Massive MIMO introduce unique challenges, including suboptimal network configurations and increased operational demands. These challenges present a compelling opportunity for innovative solutions that can optimize network performance, reduce costs and enhance customer experiences.

Harnessing advanced technologies for network optimization

Advancements in artificial intelligence (AI), machine learning (ML) and cloud technologies are driving new approaches to network design and optimization. By leveraging digital twins, CSPs can create virtual replicas of their networks to simulate performance, analyze site-specific data and identify optimal configurations. This technology enables faster, more accurate decision-making, reduces reliance on physical testing and improves energy efficiency—key factors for sustainable growth in a competitive market.

Driving measurable performance gains with AI and Digital Twins

At the heart of effective network performance optimization is a focus on robust analytics, cloud-enabled collaboration and seamless integration with industry standards. Solution providers who combine these capabilities with deep expertise in radio frequency (RF) technologies can deliver tailored, data-driven outcomes that meet CSPs' unique needs.

In this solution brief, we will discuss how Nokia's Network Planning and Optimization services leverage these technologies and approaches to help CSPs achieve performance targets 30% faster, reduce energy consumption and maximize ROI. For example, across recent customer projects, Nokia has increased downlink throughput by an average of 20%—without adding any new equipment. With best-in-class RF experts and innovative digital twin technology, Nokia offers a comprehensive solution to meet the demands of modern telecommunications networks.

2D   3D
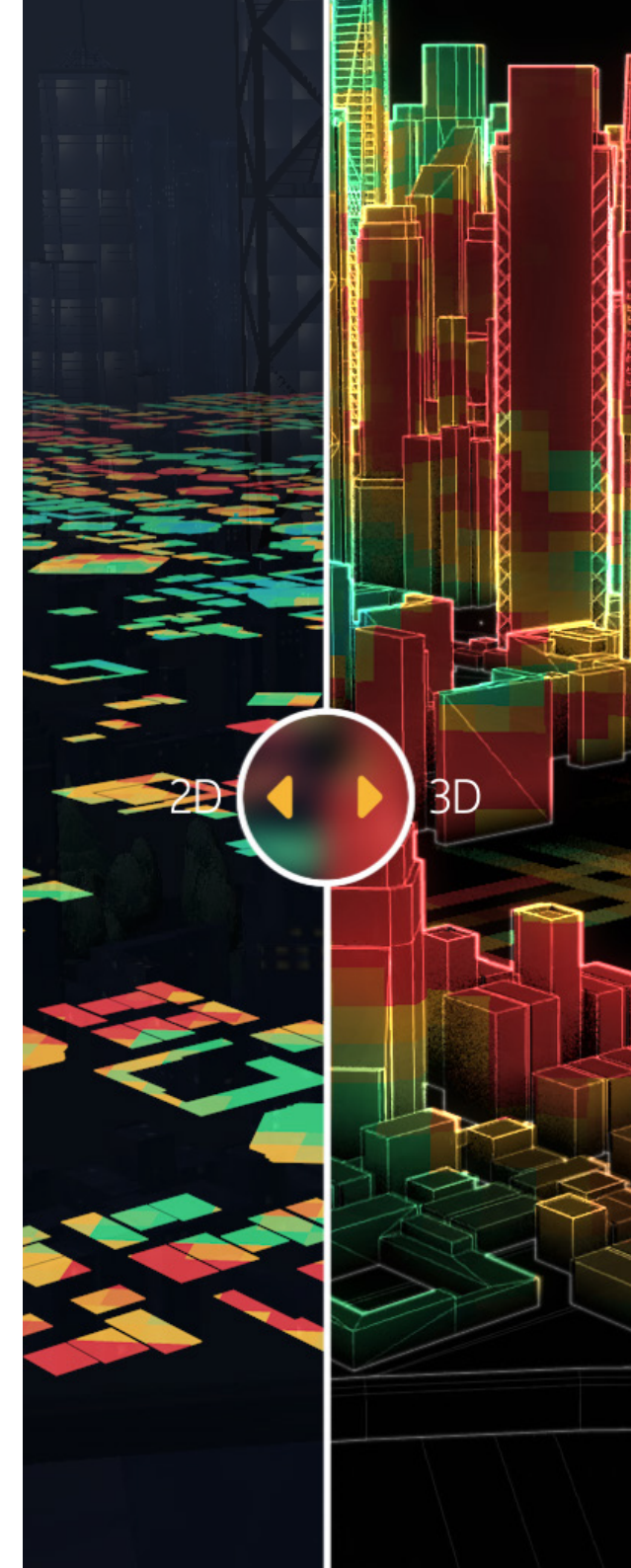
Unlocking business opportunities with Network Performance Optimization services

CSPs face growing pressure to reduce CAPEX and OPEX while improving network quality. This challenge is particularly pronounced with the deployment of 5G technologies such as Massive MIMO, which introduce unprecedented complexity and require advanced optimization strategies. These challenges present significant business opportunities for solution providers who can address the industry's pain points with innovative, data-driven technologies.

## Optimizing networks beyond generic configurations

One key opportunity lies in helping CSPs optimize their networks to move beyond generic configurations. When first deploying Massive MIMO, CSPs often rely on default beam sets designed for generic environments, leading to suboptimal coverage and capacity. The ability to implement cell-specific optimization using spatial data and real-time performance indicators offers a clear path to improving network quality and cost efficiency. Businesses that can deliver these capabilities stand to gain a competitive edge in a market eager for solutions that balance performance and operational cost.

Leveraging emerging technologies

The current technological landscape amplifies these opportunities. Advancements in artificial intelligence and machine learning enable CSPs to leverage vast datasets for actionable insights, automate routine tasks and anticipate potential issues. Digital twin technology, which creates virtual representations of physical and RF network components, allows CSPs to simulate and optimize network performance under varying conditions. Additionally, cloud-based platforms provide the scalability, collaboration and data-sharing capabilities necessary to implement these technologies effectively.

Focus areas for solution providers

To capitalize on these opportunities, solution providers must focus on robust data analytics to derive meaningful insights from network performance data. The ability to integrate seamlessly with cloud infrastructure is also essential, enabling real-time collaboration and scalable deployment. Compliance with industry standards and active participation in bodies such as 3GPP and ETSI are critical to ensuring that solutions align with regulatory requirements and evolving industry practices.
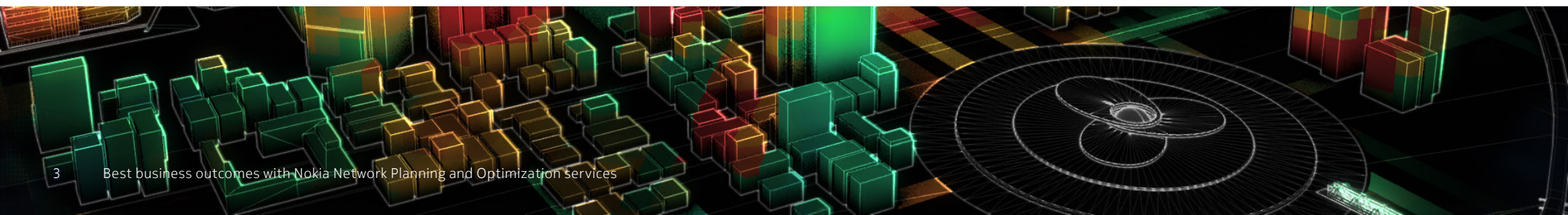
Nokia's portfolio

Nokia offers a comprehensive suite of Network Planning and Optimization services designed to help CSPs maximize the performance, efficiency and profitability of their networks. Leveraging cutting-edge technology, advanced analytics and AI-driven automation, Nokia enables CSPs to tackle modern network challenges while delivering superior customer experiences through solutions and services including:

Network design: Nokia provides end-to-end network design services, encompassing both high- and low-level designs. These services focus on optimizing site selection, coverage, quality, capacity and energy consumption to ensure the best possible performance from the outset.

Network evolution & strategy: With Nokia's smart CAPEX analysis, CSPs can strategically invest where it matters most. By creating a digital network twin, Nokia leverages AI/ML to identify unserved demand, analyze existing network coverage and predict subscriber behavior. This data-driven approach reduces churn, improves ROI by up to 20% and more, and supports profitable 5G expansion strategies.

Enhanced Field Performance Validation (EFPV): EFPV eliminates the need for traditional drive tests by gathering performance data directly from subscriber devices. This fully automated solution provides a comprehensive view of network performance, including indoor environments, while protecting user privacy. EFPV reduces CO_2 emissions, increases road safety, accelerates performance issue detection, and delivers actionable insights for network improvement.

Digital pre-launch optimization: Pre-launch optimization transitions from manual, fragmented workflows to Nokia's digital platform. By integrating diverse data sources, Nokia's automated platform delivers rapid and precise performance evaluations. Leveraging advanced AI, it predicts target performance and enables swift corrective actions if requirements are unmet. Whether testing is conducted via OSS, EFPV, drones, automated field performance or even traditional drive tests, Nokia ensures full integration with closed-loop self-healing capabilities for seamless and reliable optimization.
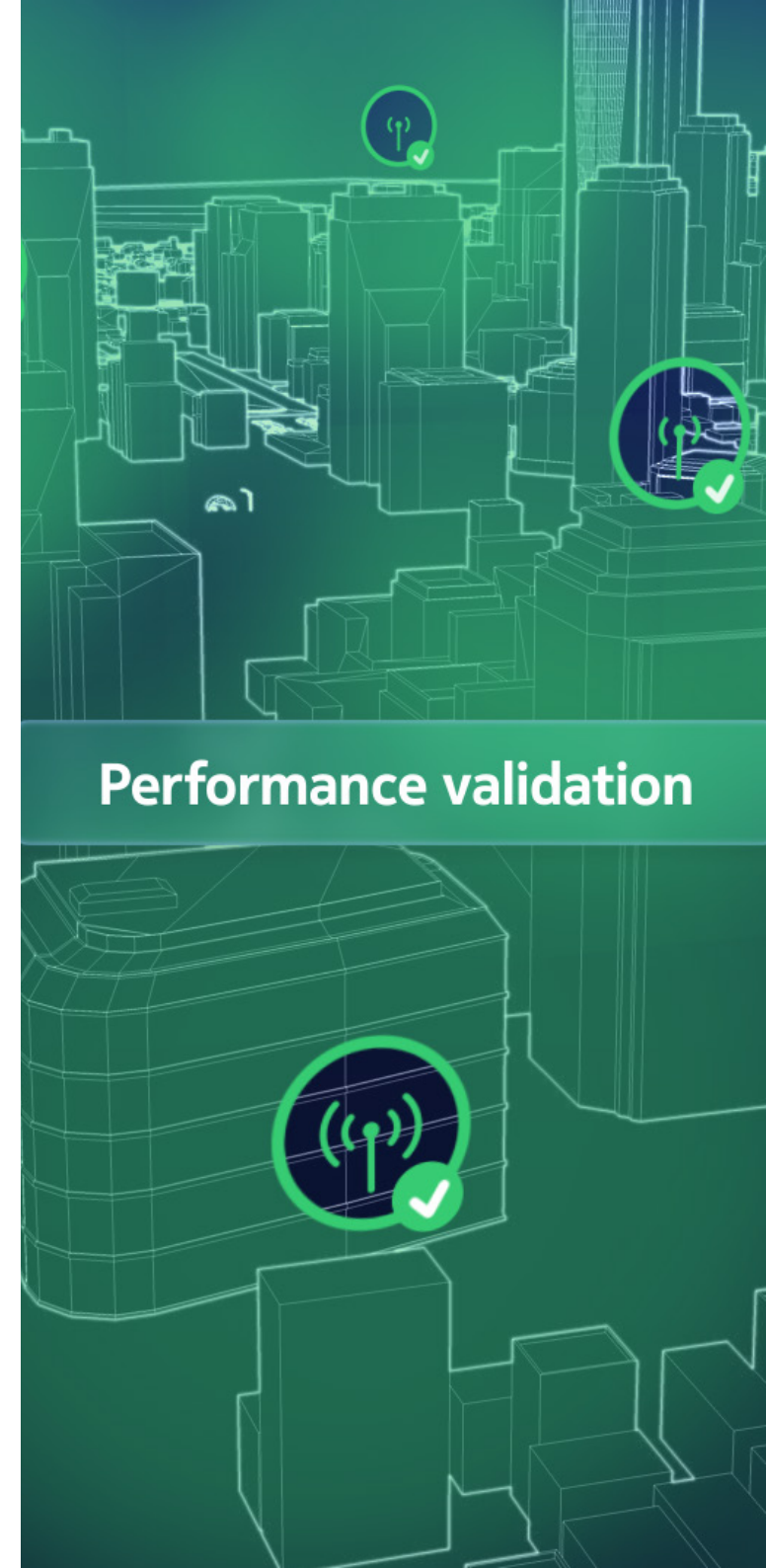
Performance validation
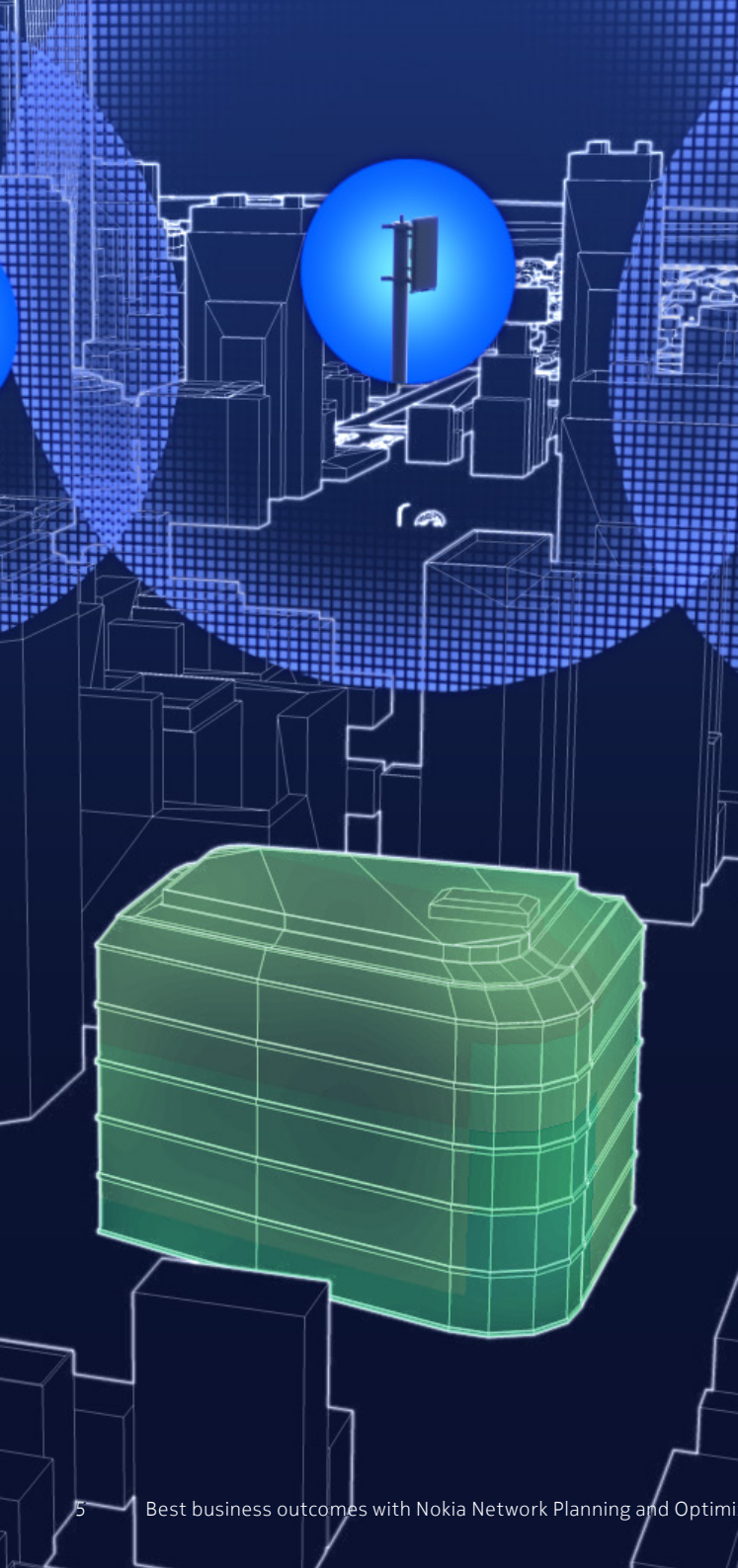
Network optimization: Nokia incorporates AI/ML and automation to deliver faster, more comprehensive optimization. Energy efficiency is a key focus, with Nokia's solutions reducing RAN power consumption by up to 20% through fine-grained adjustments. These optimizations also enhance throughput and overall network quality.

AI-Based Digital Network Twin: Nokia's precise digital twin technology provides a near real-time, holistic view of network performance. By simulating network scenarios and automating corrective actions, Nokia's digital twins empower CSPs to reduce design times, enhance downlink throughput by 20% on average, and effectively mitigate interference. With the recently developed advanced Extended Reality (XR) Digital Twin visualization, CSPs can unlock new revenue streams and maximize network monetization through innovative, data-driven use cases. The immersive visualization aids in optimizing monetization by analyzing coverage in high-rise buildings, assessing drone and vehicle paths, and simplifying FWA deployment using VR and AR. This approach reduces churn and enhances network monetization opportunities effectively.

A differentiated approach to network planning and optimization: Nokia's Network Planning and Optimization services differentiate themselves through a combination of advanced AI and digital twin technology, deep expertise and a strong focus on addressing customer pain points. The integration of digital twin technology allows CSPs to simulate and predict network behavior, enabling precise design and optimization tailored to real-world conditions. AI-powered optimization enhances this by automating complex processes and providing data-driven insights that drive superior network performance and efficiency. Nokia's integrated analytics ecosystem consolidates data from various sources, offering CSPs actionable insights to make informed decisions quickly and effectively.

Commitment to energy efficiency and sustainability

A key element of Nokia's approach is our commitment to energy efficiency, with solutions that reduce RAN power consumption by up to 20%. This aligns with CSPs' growing focus on sustainability and operational cost reduction.
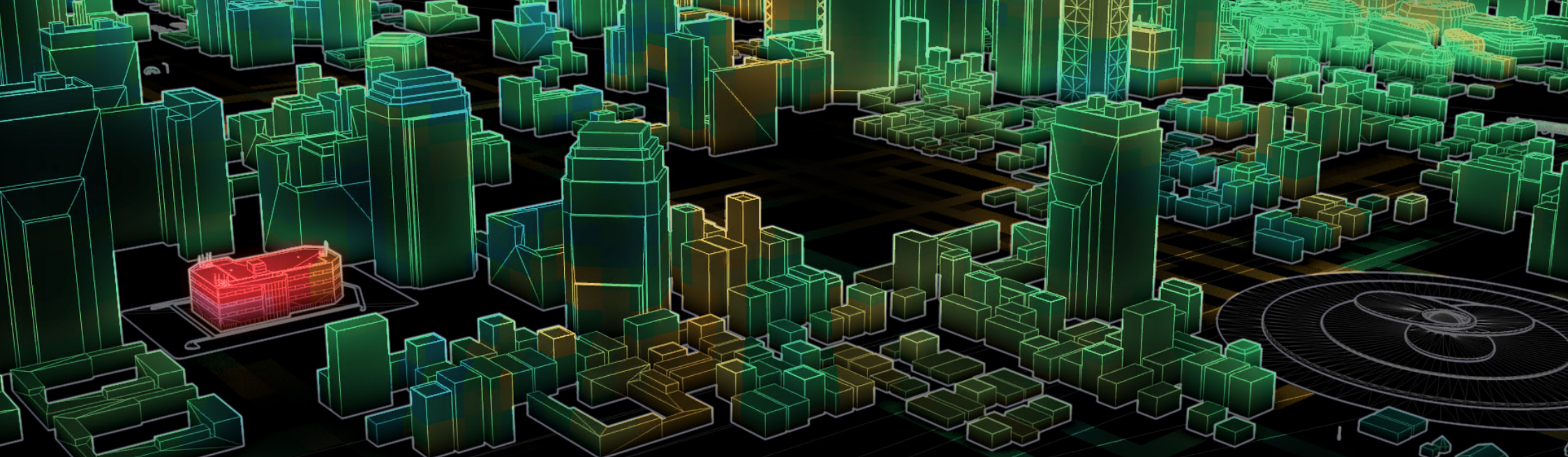
Customer use cases

Nokia's Network Planning and Optimization services have delivered transformative results for CSPs worldwide, enabling them to enhance network performance, improve efficiency and achieve significant business outcomes. Below are key examples that illustrate the impact of our solutions:

Indosat: Fastest large-scale multi-operator network integration

Indosat achieved a groundbreaking milestone with the world's fastest large-scale multi-operator network integration, consolidating and modernizing 40,000 radio sites in just 12 months. Nokia's expertise in network optimization enabled Indosat to streamline operations by reducing RAN sites by 25% while simultaneously achieving a 52% increase in downlink speeds and a 34% boost in

network capacity. These improvements not only enhanced the end-user experience but also maximized the efficiency of network resources. This project exemplifies Nokia's ability to deliver large-scale optimization at record speeds with outstanding results.

Read the full case study here.

MobiFone: Pioneering energy efficiency

In Vietnam, MobiFone partnered with Nokia to tackle rising energy consumption and costs while maintaining high network performance.

As the first operator globally to adopt Nokia's Digital Design service, MobiFone optimized power settings at the cell level across its radio network. This innovative solution resulted in energy savings of nearly 14% across 88% of radio cells in the 4G pilot cluster, without compromising key performance indicators such as throughput, channel quality, or traffic volume.

By leveraging Nokia's analytics tools and expertise, MobiFone achieved enhanced cell-edge throughput and reduced carbon

emissions, aligning with its commitment to sustainability and Vietnam's transition to a green economy. The successful pilot paves the way for wider deployment, showcasing Nokia's ability to deliver energy efficiency alongside robust network performance improvements. Read the full case study here.

First-tier operator in Australia: Zero-touch acceptance for accelerated deployment
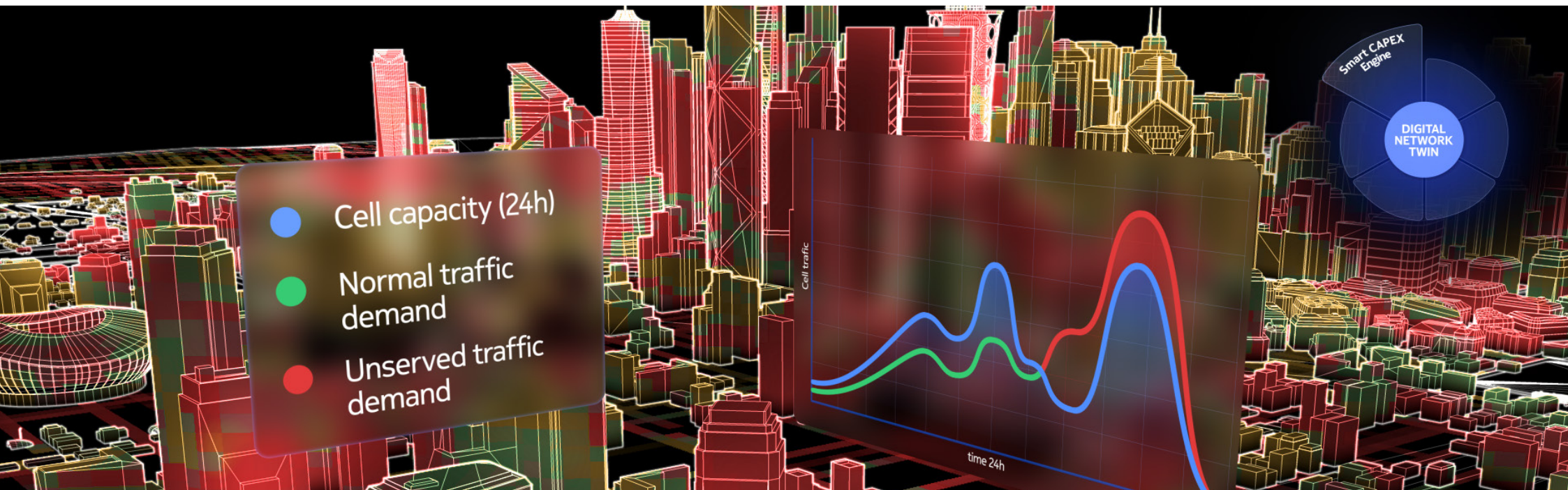
A leading operator in Australia faced challenges in accelerating site acceptance and validating network performance while maintaining high-quality standards. Nokia addressed these pain points with our zero-touch acceptance solution, automating the process to validate OSS KPIs against pre-defined targets and ensuring deployed sites met initial design expectations for coverage and throughput.

This approach achieved a 30% faster acceptance cycle without any quality degradation. Furthermore, Nokia's Zero Drive Test methodology eliminated the need for physical drive tests, significantly reducing CO_2 emissions and contributing to the operator's sustainability goals. By automating acceptance and ensuring performance alignment, Nokia enabled the operator to rapidly deploy sites while improving operational efficiency.

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Cell capacity (24h)

Normal traffic demand

Unserved traffic demand

Cell traffic

time 24h

Smart CAPEX Engine

DIGITAL NETWORK TWIN

Why Nokia?

Nokia's Network Planning and Optimization services combine advanced expertise, cutting-edge technology and sustainability-driven strategies to deliver exceptional network design and optimization outcomes.

Our position as a leader in the industry is exemplified by certain qualities and innovations such as:

- **Advanced RF expertise** ensures optimized network design for superior coverage, capacity, and efficiency.

- **Precise signal propagation** and interference prediction maximize spectrum utilization.

- **Fine-tuned parameters** such as cell settings, antenna configurations, and power levels enhance the user experience.

- **Advanced AI-powered digital twin technology** which enables seamless compatibility, accelerates collaboration, and facilitates real-time data sharing. We work with the most precise AI-based digital twins that sense, think and act, providing a comprehensive real-time view of the entire site design, the network and its performance.

- **Advanced analytics** that provide actionable insights, improving efficiency and decision-making.

- **Performance targets which are achieved 30% faster,** reducing time to target performance compared to traditional methods.

Another important focus for us and our customers is sustainability, exemplified by:

- **Reduced RAN energy consumption** by up to 20% helps lower operational costs and environmental impact.

- **Enhanced network performance** which delivers downlink throughput gains of up to 20%.

- **Drive test replacement via Geosynthesis** eliminates over 120,000 drive tests in 2024 alone, accelerating and enhancing the accuracy of field performance validation, improving safety, and significantly reducing CO_2 emissions.

Lastly, Nokia prioritizes maximizing ROI for its customers through smart CAPEX analysis powered by digital twin technology, achieving improvements of more than 20%. Nokia's Network Planning and Optimization services set a new standard in the industry, making it a trusted partner for CSPs worldwide. For a greater overview of Nokia's Mobile Network Services, please refer to the Services Solution Brief here.

At Nokia, we create technology that helps the world act together.

As a B2B technology innovation leader, we are pioneering networks that sense, think and act by leveraging our work across mobile, fixed and cloud networks. In addition, we create value with intellectual property and long-term research, led by the award-winning Nokia Bell Labs, which is celebrating 100 years of innovation.

With truly open architectures that seamlessly integrate into any ecosystem, our high-performance networks create new opportunities for monetization and scale. Service providers, enterprises and partners worldwide trust Nokia to deliver secure, reliable and sustainable networks today – and work with us to create the digital services and applications of the future.