

# 5G Advanced location services

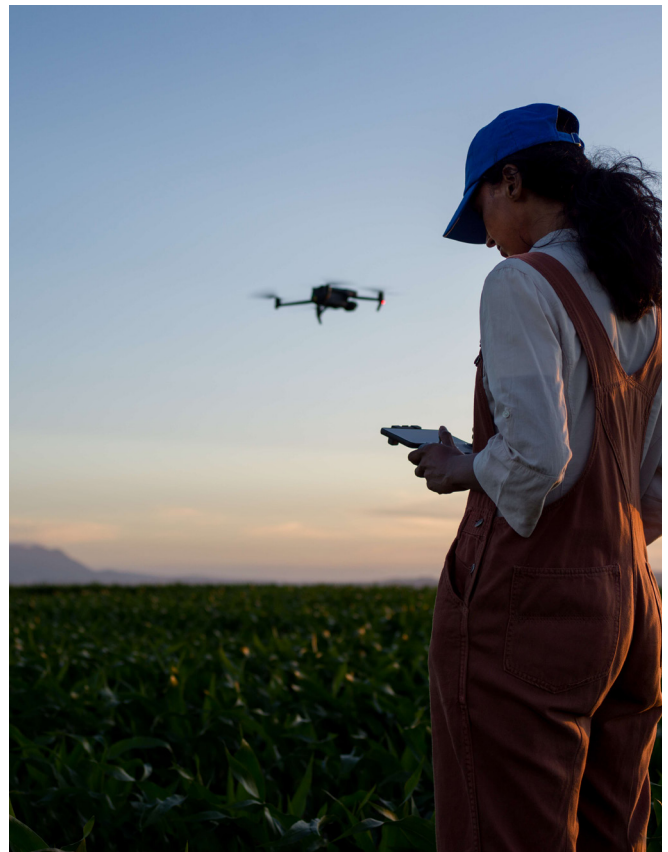
**Explore how communication service providers can unlock new verticals and monetize 5G networks across a multitude of use cases**



**ERICSSON**

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# Introduction

Providing the capability to locate objects and people with high precision anywhere at a reasonable cost creates opportunities to launch new applications for a wide range of enterprises, public sector organizations, and consumer services. Current location services on the market for indoor and outdoor environments do not work everywhere; they are often deployed as separate systems and are costly to operate. With 5G Advanced networks, everything changes—it is now possible to locate devices seamlessly indoors and outdoors using the same system that provides the connectivity.

Learn what 5G Advanced location services means and how communication service providers can address new business opportunities through a multitude of 5G use case and monetization examples.



## Understanding 5G Advanced location services

5G Advanced location services represent a leap in location-based technology, offering highly accurate and efficient tracking capabilities through 5G networks. These services integrate positioning functionality directly into the 5G Standalone (5G SA) network, enabling seamless indoor and outdoor localization with sub-meter accuracy. These services redefine location data as an essential network capability while minimizing power consumption and device dependencies. As the 5G device ecosystem is global, there will be numerous types of affordable 5G smartphones, IoT devices, and other types of applications for all kinds of industry use cases.

Additionally, application developers can easily access network-based location insights through a suite of

powerful APIs delivered directly from the service providers' 5G networks, or via API aggregators. These APIs unlock monetization and set the stage for innovative location-based applications created at scale.

## Turning location data into advantage

Accurate location data is essential for industries in this age of automation, supply chain management, and optimization. Existing positioning technologies, like the Global Positioning System (GPS), face limitations such as lack of signals indoors, high battery consumption, and susceptibility to jamming or spoofing. Alternative solutions, like Bluetooth and Ultra-Wideband, require additional equipment and are primarily intended for indoor use with no or limited connection to outdoor service.



The integrated capabilities of a 5G-enabled network, including 5G Advanced location services, overcome these limitations, offering scalability and affordability, making them ideal for industries undergoing technological advancements.

## 5G Standalone, the foundation for trusted location services

A 5G SA network is essential for advanced location services due to its ability to deliver superior positioning accuracy and seamless connectivity in diverse environments. Unlike earlier deployments that relied on other location technologies, SA networks directly integrate location services as a built-in feature—using end-to-end network slicing to ensure that advanced location services can operate securely and efficiently without interference from other network traffic.

## From location data to dollars: Monetizing 5G Advanced location services

5G Advanced location services unlock significant monetization opportunities for service providers by transforming 5G networks into value creation platforms rather than basic mobile broadband connectivity enablers. By exposing location data through standardized application programming interfaces (APIs), service providers can develop new revenue streams through applications in sectors like transportation, logistics, healthcare, agriculture, and augmented reality.

By embedding these capabilities in 5G SA networks, service providers capture new revenues from new customer segments, offsetting flat mobile broadband revenue growth while maximizing the utility of their infrastructure.

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Industry-specific section:

# Transforming modern manufacturing: Industry 4.0

## Executive vision

Global modern manufacturers are reimagining how factories operate—driven by automation, digital twins, and sustainability goals. 5G SA, with advanced location services, allow factories to operate more efficiently with real-time data. This makes production agile and protects workers while supporting growth for manufacturers aiming to adopt Industry 4.0 standards.

## Challenges

Manufacturers face difficulty delivering flexible production lines, real-time quality assurance, and remote equipment monitoring. Yet many still rely on legacy connectivity that lacks the responsiveness, precision, and scalability needed for modern industrial automation.

## Opportunities and solutions

New industry verticals are looking to connect with 5G. Service providers have the

chance to support enterprises in their shift to smarter operations with 5G SA networks supporting ultra-reliable, low-latency connectivity. When paired with precise location tracking, the network becomes the sensor at the heart of process automation.

By providing the key building blocks not only for connectivity but for automation, increased productivity, reduced cost and improved safety, the nature of the network itself rises from a commodity to a premium value generator. Seamless indoor and outdoor positioning with geofenced alerts and predictive actions create smarter workflows and optimized asset management.

## Value proposition

Service providers can monetize through tiered enterprise subscriptions, API bundles for asset tracking, and integration services with industrial platforms. These offerings position them as strategic partners in the digital transformation of manufacturing.

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“Seamless indoor and outdoor positioning with geofenced alerts and predictive actions create smarter workflows and optimized asset management.”

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## Example use cases

- **Geofencing** keeps autonomous robots within safe zones, reducing collision risks.
- **Real-time asset tracking** ensures tools and inventory are always locatable.
- **Indoor-outdoor handover** enables delivery vehicles to be tracked seamlessly.
- **Worker safety** is enhanced through location-based alerts and monitoring.

Industry-specific section:

# Advancing emergency response systems

## Executive vision

Urban growth, unpredictable weather, and increased population density are reshaping how cities prepare for emergencies. Public safety agencies are turning to 5G SA and location intelligence to improve response times, large-scale location analysis, and smarter processes during emergencies.

## Challenges

Emergency responders need to locate incidents instantly, communicate reliably, and assist people effectively. Traditional systems often lack the precision and scalability to support large-scale events or urban crises.

## Opportunities and solutions

Deploying 5G SA networks empowers service providers to deliver advanced solutions for public safety frameworks. Location intelligence tools, such as geofencing zones, passive alerts, and density management APIs, help public safety agencies react to incidents smarter and faster while ensuring physical safety (avoiding hazardous conditions for people being rescued) and data safety (personal and sensitive information is kept confidential, intact, and only used in authorized ways).

## Value proposition

By partnering with public agencies and offering location-oriented emergency services, service providers can unlock new revenue via public safety API subscriptions. They can also sell location service packages to event organizers, who can collaborate with public agencies to plan safe events. These services solidify service providers as critical contributors to society's safety systems.



## Example use cases

- **Geofencing** defines evacuation zones during emergencies.
- **SMS alerts and app messages** guide people to safe exits.
- **Geofencing and SIM density APIs** provide insight into the actual situation in the target area.
- **Secure slices** ensure uninterrupted communication for responders.

“By partnering with public agencies and offering location-oriented emergency services, service providers can unlock new revenue via public safety API subscriptions.”

Industry-specific section:

# Providing real-time logistics for better supply chains



“Service providers can transform logistics by deploying 5G SA networks that ensure seamless tracking of assets both indoors and outdoors.”

## Executive vision

Global supply chains face rising calls for faster and more secure shipments. Industry leaders are exploring 5G SA location services to digitize logistics—from warehouse operations to last-mile delivery. Precision and automation are no longer optional, they are essential.

## Challenges

Logistics firms struggle with poor routing, hidden or hard-to-access inventories, and employee safety concerns. Legacy systems lack the granularity and responsiveness needed for dynamic, high-volume operations.

## Opportunities and solutions

Service providers can transform logistics by deploying 5G SA networks that ensure seamless tracking of assets both indoors and outdoors. By providing a comprehensive location solution that integrates accurate outdoor positioning, traffic analytics APIs, and indoor tracking tools, they can support optimized delivery routes, improve worker safety with alerts, and enhance warehouse efficiency.

## Value proposition

Service providers can monetize through API subscriptions, logistics analytics platforms, and bundled services with warehouse management systems. These offerings position them as key enablers of supply chain modernization.

## Example use cases

- Forklifts and goods tracked in real time within warehouses.
- Accurate outdoor positioning guides trucks through urban congestion.
- Worker safety ensured via location-based alerts.
- Traffic analytics optimize warehouse throughput.

Industry-specific section:

# Revolutionizing healthcare with location intelligence

## Executive vision

Healthcare providers are leveraging digital innovations to optimize resource management and improve patient care. 5G SA with advanced location services enable hospitals to precisely locate critical equipment, staff, and patients, empowering hospitals to enhance operational efficiency and safety.

## Challenges

Finding critical equipment, managing medical deliveries safely, and coordinating staff present significant challenges for healthcare facilities. Traditional systems often lack the accuracy and reliability to efficiently manage medical resources under high-pressure situations.

## Opportunities and solutions

Through deployment of 5G SA with advanced location services, service providers can support hospitals and healthcare facilities by providing real-time data for location tracking and staff

coordination. Integrated solutions such as indoor positioning for equipment, APIs for staff and inventory tracking can streamline hospital operations and ensure patient safety.

## Value proposition

Service providers can offer subscription-based services to healthcare organizations, collaborate with medical equipment manufacturers, and offer bundled packages for healthcare management platforms. These services make them indispensable partners in healthcare digitization.

## Example use cases

- Medical equipment is located instantly via indoor positioning.
- Staff coordination improved through real-time location data and indoor positioning.
- Patient movement is tracked for safety and care optimization.

“5G SA with advanced location services enable hospitals to precisely locate critical equipment, staff, and patients, empowering hospitals to enhance operational efficiency and safety.”



Industry-specific section:

# Empowering smart event management

## Executive vision

As live events scale in size and complexity, organizers are turning to 5G SA location services to enhance safety, navigation, and payment experiences. The future of entertainment is immersive, secure, and data driven.

## Challenges

Venues often experience challenges such as crowd congestion, event navigation issues, and payment fraud. Legacy systems lack the scalability and precision needed for real-time crowd management.

## Opportunities and solutions

Service providers can empower event organizers by deploying 5G SA networks with advanced location services that support high-density environments. Integrated systems with features such as geofencing for zonal divisions, indoor tracking for navigation, and secure APIs for location-sensitive payment processing can effectively address organizers' needs while enhancing event attendee experiences.

## Value proposition

Service providers can unlock monetization opportunities through contracts with event organizers for geofencing solutions, fraud prevention APIs, and intelligent crowd management tools. By providing these solutions, service providers position themselves as innovation partners for the entertainment industry.



## Example use cases

- **Geofencing** divides venues into virtual activity zones.
- **Crowd insights** prevent bottlenecks and improve flow.
- **Location-based** payment verification reduces fraud.

“Integrated systems with features such as geofencing for zonal divisions, indoor tracking for navigation, and secure APIs for location-sensitive payment processing can effectively address organizers' needs while enhancing event attendee experiences.”

Industry-specific section:

# Enabling safer and scalable drone services

## Executive vision

Drones are transforming industries such as infrastructure inspection, agriculture, and disaster response by providing faster inspection operations. 5G SA location services provide the precision and reliability needed for autonomous flight, remote operation, and real-time data transmission.

## Challenges

Drone operators face several challenges including Global Navigation Satellite System (GNSS) spoofing, limited visibility during operations, and compliance with regulations. Traditional connectivity systems often lack the accuracy and robust security necessary for mission-critical aerial operations. Dynamic ground risk analysis capability needs to be in place to enable flights beyond visual line of sight (BV-LOS).

## Opportunities and solutions

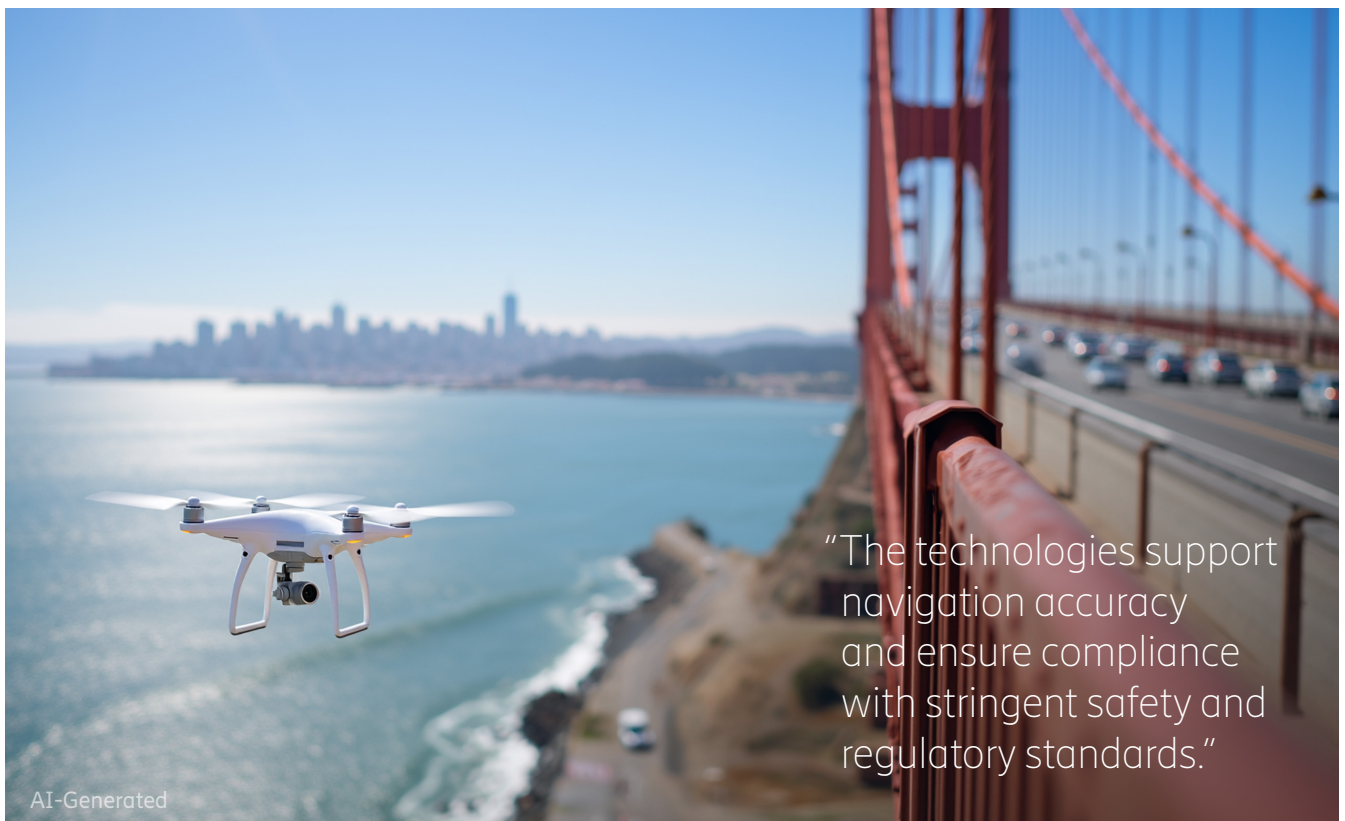
Service providers can enable safe, scalable drone services by deploying 5G SA networks with advanced location services. These technologies provide precision tracking solutions that combine accurate outdoor positioning, macro positioning, passive 5G, and SIM density API analytics. The technologies support navigation accuracy and ensure compliance with stringent safety and regulatory standards.

## Value proposition

Service providers can offer subscription services to drone operators, infrastructure management companies, and public safety agencies. These solutions position service providers as essential contributors in advancing aerial automation and application-specific drone services.

## Example use cases

- Drones inspect bridges with centimeter-level accuracy.
- Remote pilots avoid crowds using population density API analytics.
- GNSS spoofing mitigated via 5G macro validation.



Industry-specific section:

# Supporting efficient precision agriculture

## Executive vision

Agriculture is witnessing rapid digital transformation, as smart farming enables increased crop productivity, optimized resource utilization, and better livestock management. 5G SA, with advanced location services, is driving efficiency by providing farmers with tools to monitor, automate, and streamline agricultural processes.

## Challenges

Farmers encounter difficulties in efficiently tracking livestock, operating machinery, and monitoring environmental factors, which impact productivity and sustainability. Existing connectivity solutions often fail to deliver the reliability or accuracy necessary for fully embracing digital farming practices.

## Opportunities and solutions

Service providers can support smart agriculture by deploying 5G SA networks across rural and agricultural areas. By

integrating accurate outdoor positioning, macro positioning and geofencing APIs, they can enable precision farming that is essential for sustainable practices.

## Value proposition

Service providers can offer accurate outdoor positioning tailored for agricultural use, develop location-based API solutions for farm management platforms, and bundle services with advanced agricultural technologies. This positions them as critical participants in the future of sustainable farming.

## Example use cases

- Accurate outdoor positioning guides tractors for precision plowing and fertilization.
- Geofencing alerts for livestock movement.

“5G SA, with advanced location services, is driving efficiency by providing farmers with tools to monitor, automate, and streamline agricultural processes.”



Industry-specific section:

# Optimizing operations in intelligent cities

## Executive vision

As urban centers grow larger and more complex, digital infrastructure powered by 5G SA networks presents transformative possibilities. Advanced location services support improved city mobility, more efficient energy management, smart street lighting, localized information sharing, and safer public spaces.

## Challenges

Urban planners and municipal bodies face challenges in managing traffic congestion, monitoring utilities, and ensuring public safety. Legacy systems lack the responsiveness and precision needed to address these urban challenges effectively due to technology fragmentation and differing levels of support among devices.

## Opportunities and solutions

Through the deployment of 5G SA networks, service providers can optimize city operations with high-precision location solutions. Passive tracking systems, geofencing, density analytics, and indoor tracking enable proactive urban planning and improved infrastructure management.

## Value proposition

Service providers can create opportunities to establish long-term contracts with cities and municipalities by providing valuable smart infrastructure services. By combining location data services with urban planning analytics platforms, they can take a leading role in the global movement toward creating intelligent cities.

## Example use cases

- **Traffic redirected in real time** based on location insights to reduce jams.
- **Geofencing APIs** can trigger actions when inspectors, drones, or maintenance crews enter or exit an area, ensuring inspections are performed to standard.
- **Crowd analytics with SIM density** improves safety and relieves pressure on urban hotspots.
- **Underground positioning** enables tunnel navigation for trains and provides garage parking assistance for vehicles.

“Through the deployment of 5G SA networks, service providers can optimize city operations with high-precision location solutions.”



Industry-specific section:

# Paving the way for safer, smarter vehicles

## Executive vision

The automotive industry is advancing toward connected mobility, autonomous driving, and electric vehicles. 5G SA with advanced location services provide critical navigation accuracy and safety features that cater to the demands of next-generation automotive innovation.

## Challenges

Vehicle manufacturers, public transit agencies and operators, and municipal traffic and road authorities face challenges in achieving precise vehicle navigation, managing road congestion, and ensuring passenger safety. Legacy GPS technology lacks the precision required for advanced, automated driving tasks.

## Opportunities and solutions

Service providers can support automotive advancements by integrating 5G SA networks with advanced location technologies such as accurate outdoor positioning, location APIs for collision avoidance, and seamless indoor-outdoor tracking tools. These solutions create safe and efficient navigation and allow the automotive industry to implement smarter technologies.

## Value proposition

Service providers can offer tailored subscriptions for original equipment manufacturers (OEMs) and fleet management businesses.

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“These solutions create safe and efficient navigation and allow the automotive industry to implement smarter technologies.”

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## Example use cases

- **Autonomous taxis** dynamically reroute in response to live traffic data and location insights.
- **Accurate outdoor positioning** supports lane-level navigation.
- **Collision risks are mitigated** via location APIs.
- **Vehicles navigate tunnels and parking areas** seamlessly.

Industry-specific section:

# Ushering in the next-generation retail experiences

## Executive vision

Retail businesses are rapidly transforming by utilizing digital solutions to enhance personalized shopping experiences and secure payment processes. 5G SA with advanced location services enable seamless navigation within stores and provide fraud-resistant transaction capabilities in stores and on-line, completely redefining the way consumers shop.

## Challenges

Retailers encounter obstacles in guiding customers effectively, preventing payment fraud, and keeping the shopping experience engaging. Relevant ads and promotions delivered at the right time and place suffer from dependencies on user equipment and limited reach. Existing systems often lack the precision and security needed to deliver innovative and immersive in-store experiences. Online shopping can also be made more secure by identifying the location of credit card transactions.

## Opportunities and solutions

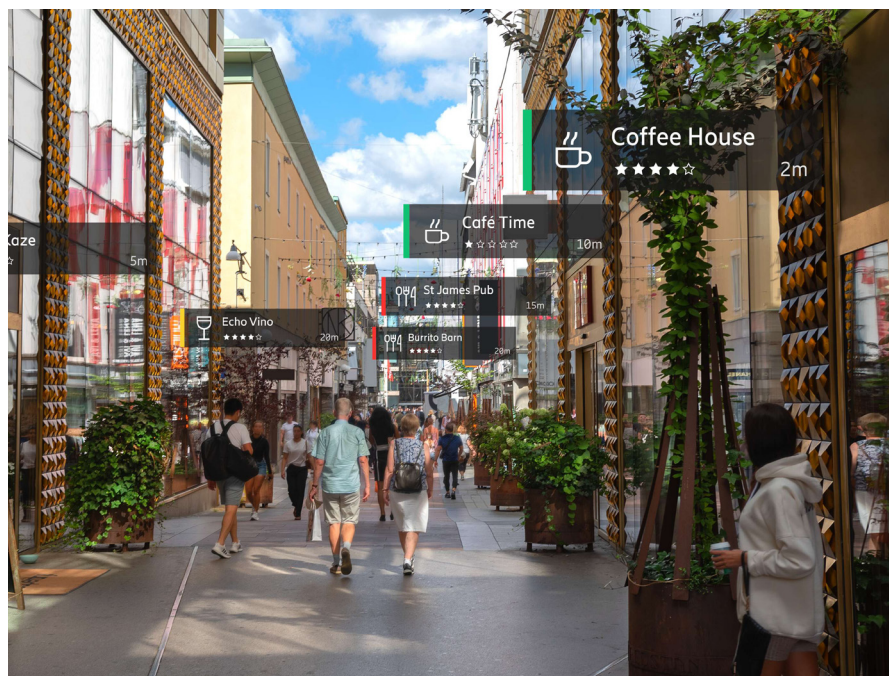
By deploying 5G SA networks with location-based tools, service providers can empower retailers to enhance operational efficiency and customer satisfaction. Comprehensive solutions combining passive positioning, accurate indoor navigation, and secure payment APIs enable retailers to deliver personalized services tailored to consumer behavior and location.

## Value proposition

Retail presents lucrative monetization options for service providers through location API subscriptions; analytics platforms focused on retail customer behaviors and bundled services with point-of-sale (POS) systems. These services position service providers as technology partners in retail digital transformation to drive revenue growth.

## Example use cases

- Shoppers guided to products via indoor maps using indoor location capabilities.
- Location-based alerts trigger promotions.
- Secure payments in shops and on-line verified by location APIs.
- Foot traffic analyzed for layout optimization using SIM density API.



“Comprehensive solutions combining passive positioning, accurate indoor navigation, and secure payment APIs enable retailers to deliver personalized services tailored to consumer behavior and location.”

Industry-specific section:

# Facilitating smarter, safer, and more productive offices



“Industry leaders recognize the value of location intelligence in improving workspace sustainability and ensuring regulatory compliance.”

## Executive vision

In modern workplaces, hybrid work models require adaptable, secure, and efficient environments. 5G SA networks combined with advanced location services provide real-time data that improves space utilization, enhances employee safety, and optimizes operational productivity. Industry leaders recognize the value of location intelligence in improving workspace sustainability and ensuring regulatory compliance.

## Challenges

Companies face difficulties in maximizing workspace usage, upholding safety standards, and ensuring efficient operations. Conventional systems lack the precision for dynamic tasks such as desk reservations and energy optimization in office buildings.

## Opportunities and solutions

Service providers can facilitate smarter workplaces with 5G SA networks that integrate real-time indoor navigation, geofencing APIs for managing building occupancy and macro positioning. These advanced location services create secure, agile, and sustainable work environments with enhanced communication capabilities for better employee experience.

## Value proposition

Service providers can monetize through enterprise subscriptions for smart building services, creating tailored API bundles for facility management, and collaborating with workplace technology companies. These offers will position service providers as key contributors to the next generation of adaptive and efficient work environments.

## Example use cases

- **Employees navigate** large campuses with indoor maps and real-time directions.
- **Geofencing supports** dynamic desk booking and meeting room access.
- **Occupancy analytics** optimize Heating, Ventilation and Air Conditioning (HVAC) and lighting systems for sustainability.
- **Location-based alerts** assist in emergency evacuations and compliance tracking.

Summary:

# 5G Advanced location services brings a new monetization opportunity through 5G Standalone networks

5G SA networks with advanced location services empower enterprises and public sector organizations to succeed in the evolving digital landscape. By providing precise, scalable, and secure positioning capabilities, these networks enable service providers to deliver innovative, tailored solutions for a variety of industries. This positions service providers as leaders in driving transformation and fostering digital growth across sectors.

**5G Advanced location services** address unique industry challenges and create opportunities, particularly in healthcare, logistics, agriculture, retail, automotive, smart cities, and workplace management. These solutions deliver measurable benefits, including:

**Real-time tracking and monitoring of assets**

**Improved safety** through geofencing and secure alerts based on location data

**Streamlined operations and workflows** enabled by precise location analytics

**Support for cutting-edge** applications such as autonomous drones and Automated Guided Vehicles (AGV)

The widespread adoption of 5G SA networks integrated with advanced location services is set to redefine industries by advancing sustainability, elevating customer and employee experiences, and fostering unparalleled innovation. These networks pave the way for smart technologies to seamlessly integrate into daily life while emphasizing automation, connectivity, and efficiency.

Service providers are uniquely positioned to lead the charge in transforming industries through the adoption of 5G Advanced location services. With Ericsson's state-of-the-art technologies and solutions, service providers can ensure they remain at the forefront of digital innovation.



## About Ericsson

Ericsson enables communications service providers and enterprises to capture the full value of connectivity. The company's portfolio spans the following business areas: Networks, Cloud Software and Services, Enterprise Wireless Solutions, Global Communications Platform, and Technologies and New Businesses. It is designed to help our customers go digital, increase efficiency and find new revenue streams. Ericsson's innovation investments have delivered the benefits of mobility and mobile broadband to billions of people globally. Ericsson stock is listed on Nasdaq Stockholm and on Nasdaq New York.

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