

INSEEGO: 5G BORN IN THE U.S.A.

UNCOMPROMISED SECURITY, PERFORMANCE, AND RELIABILITY

EXECUTIVE SUMMARY

The United States government views the deployment of 5G networking as a strategic initiative that will unlock transformative enterprise services. The throughput and latency of 5G — a vast improvement over current 4G Long-Term Evolution (LTE) technology — will disrupt the market and accelerate digital transformation. Given the potential positive economic impact of 5G on gross domestic product (GDP) and job creation, the federal government means to accelerate 5G deployment by AT&T, the new T-Mobile, Verizon, and other domestic operators through several initiatives.

The FCC 5G FAST Plan accelerates deployments by making more licensed spectrum available, updating infrastructure policy, and modernizing legacy regulations. At the same time, the current administration is concerned about the security of 4G LTE and 5G networking. Growing adoption of Internet of Things (IoT), smartphone, and hotspot devices, as well as the advent of cellular-based fixed wireless access (FWA) for residential broadband services, has resulted in a proliferation of connected devices that leave networks more internally vulnerable. On April 4th, 2020, President Trump ordered the formation of an advisory board — “Team Telecom” — to help ensure the security of domestic networks from an external perspective. The board’s purpose is to advise the FCC on law enforcement provisions and to grant licenses to non-domestically controlled entities.

To further address security concerns, the FCC and the federal government at large believe there is a need for an end-to-end 5G offering from North American manufacturers, as an alternative to offerings from Ericsson, Huawei, Nokia, Samsung, and ZTE. Many of these companies have established 5G proof-of-concept labs and service and support centers in the U.S. to support their ongoing 4G LTE deployments and 5G network rollouts. However, the national security implications of 5G in connecting government agencies, military branches, first responders, energy grids, transportation, logistical systems, healthcare networks, educational institutions, and financial markets drive a desire to wean U.S. dependence away from foreign companies.

In short, the market needs a domestically sourced 5G platform with infrastructure that spans from network core to radio access to network edge, as well as to customer-premise and end-user devices. Core networking components serve as the central part

of a cellular network and knit together mobile, fixed, and converged connectivity to ensure a consistent user experience. Radio Access Networking (RAN) components include base stations that cover fixed geographies and antenna arrays that amplify coverage. Edge infrastructure brings computing resources closer to users and data creation points to improve the quality of mobile service.

Inseego Corporation is a domestic provider of IoT and mobile solutions, as well as enterprise software as a service (SaaS). The company has traditionally focused on customer-premise and end-user devices, ranging from mobile “MiFi” hotspots to industrial IoT access points and routers. However, the ever-evolving capabilities of these devices, combined with the high-throughput and low-latency capabilities of 5G networks, will unlock new use cases at the network edge. Inseego devices should provide compelling functionality in asset tracking, fleet management, software-defined networking, video surveillance and analytics, edge-based artificial intelligence (AI), and mobile broadband services.

Moor Insights & Strategy recommends considering Inseego within any plan for a domestically sourced, end-to-end 5G infrastructure deployment. Inseego’s capabilities are supported by its proven industry track record, depth of portfolio, technical strength in security and performance, and extensive partnerships with domestic 5G solution leaders including Qualcomm.

WHY INSEEGO

Inseego has a long and proven track record in the cellular industry, demonstrated by its first-to-market device leadership in both 4G LTE and 5G. Founded nearly 25 years ago, the company is based in San Diego, California, with offices in Australia, Germany, the Netherlands, South Africa, and the United Kingdom. The company has made numerous innovations and contributions to the cellular device ecosystem through its intellectual property (IP). Among the most notable are Inseego’s pioneering of the USB 2-in-1 thumbdrive modem and the MiFi mobile hotspot. The company has nearly 1,300 global employees, but it develops all of its intellectual property tied to 4G LTE and 5G networking in the U.S. Although the company does manufacture some products offshore, it heeded the current administration’s call to move its manufacturing from China and is also investigating bringing assembly onshore.

Inseego’s recently demonstrated worldwide growth also positions it as a dependable equipment and services provider. The company is divided into two core business units: IoT/ Mobility and Enterprise SaaS. In its most recent filing for the 2019 financial year,

the company reported a nearly 10% increase in revenue year-over-year, coinciding with the introduction of its initial 5G products and services. The company has 5G trials underway with 20 mobile operators globally to launch one of the industry's first 5G mobile hotspots. Inseego also realized significant growth in its enterprise SaaS business with its Ctrack fleet unit delivering 36% annual growth.

Moor Insights & Strategy believes that Inseego is also well diversified, given its reach into industrial 5G and IoT. This is a growing private-networking sector that leverages cellular-based infrastructure for specific enterprise use-case needs. Inseego also has a strong presence in consumer markets with the MiFi brand of wireless hotspots. Only a handful of cellular device companies have depth in both consumer and commercial sectors, giving Inseego an advantage due to its understanding of operator, enterprise, and subscriber needs.

Some of the largest providers of both cellular infrastructure and end-use devices point to significant investment in research and development and patent filing as evidence of their claims to 5G leadership and value. However, neither is a true or complete indication of innovation. Moor Insights & Strategy believes that Inseego delivers high value. The company's core value proposition can be broken down into two elements: its deep level of security expertise and its technical platform performance. Let's examine these two strengths:

- **Security:** Inseego employs a design philosophy that integrates a high level of security throughout its technology stack, from its silicon to its software. The company also leverages third-party penetration testing to validate resiliency and functionality. Inseego's insistence on a "no back door" policy is significant, as is its investment in value-added functionality for the continuum of stakeholders. For consumers, Inseego provides guest networks with better password management, improved network separation, and the latest wireless encryption protocols to ensure the highest levels of privacy. For enterprises, the company helps safeguard corporate resources and intellectual property through its extensive virtual private network (VPN) appliance testing, its encryption of software updates and backup/restore functions, and its port and MAC filtering capabilities. Furthermore, Inseego ensures maximum network uptime through cybersecurity offerings such as threat detection and mitigation, malware detection, content filtering, and controls. Finally, Inseego provides operators with remote management and frequent software and firmware updates to deliver a dependable and secure subscriber experience.

- **Technical Performance:** Inseego has developed specific IP that enhances its architectural design and performance. This innovation is crucial to cellular network operability since optimized radio performance is essential for reliable connectivity. The patented Inseego MiFi iQ technology platform encompasses efficient, high-performance antenna designs; algorithms that are aimed at optimizing responsiveness for a range of 5G use cases; and hardened security features. The company's industrial and thermal management designs also ensure reliable, sustained performance in demanding real-world applications and environments. As a proof point, the Inseego 5G MiFi M1000 Mobile Hotspot has achieved an astounding 2+ Gbps of throughput in Verizon 5G live network trials, as compared to a typical device average of 1 Gbps. The performance benchmarking results conducted and documented by Inseego can be found in their report **"Inseego, Huawei and ZTE: A Side-By-Side Security and Performance Snapshot"**.

A DOMESTIC 5G SUPPLY CHAIN AND OPEN ECOSYSTEM

Inseego participates squarely in the air-interface portion of cellular networks, leveraging an industry standards-based approach in the design of its end-device offerings. Through this philosophy, the company ensures interoperability with all of the major 5G infrastructure providers. This affords Inseego an exceptional degree of compatibility and flexibility with respect to its supply chain sourcing requirements. Network-edge devices serve as an "on-ramp" within any cellular network and thus should be sourced from trusted partners.

Inseego works with a wide number of U.S.-based partners, including Qualcomm, to bring cutting-edge security and 5G functionality to market quickly. This also enables the company to support disruptive initiatives such as Virtualized RAN (vRAN) and OpenRAN. These initiatives have the potential to drive significant operator agility, speed of deployment, and capital expense (CapEx) and operating expense (OpEx) savings. Inseego's partnerships with non-U.S. based industry infrastructure leaders such as Ericsson and Nokia have also contributed to the early adoption of Inseego 5G offerings by operators worldwide, dating back to late 2018.

In addition, Inseego's partnerships have been instrumental in critical revisions to past 3G and current 4G LTE networks that benefited operators and subscribers alike. Moor Insights & Strategy believes that Inseego's platform position provides the flexibility to pursue future partnerships that could accelerate innovation of future 5G products and enterprise services.

Conformance and contribution to 5G, open source, and telco cloudification support standards that directly impact network interoperability, agility, and scalability. From a 5G standards perspective, Inseego complies with all Global System for Mobile Communications Association (GSMA) and Third Generation Partnership Project (3GPP) specifications and is actively engaged with both traditional RAN and OpenRAN vendors to bring fully interoperable 4G LTE and 5G solutions to market. Inseego is a member of the GSMA and is also active in many open source consortiums — including the O-RAN Alliance, OpenRAN initiative, and Linux Foundation — to further innovation, industry collaboration, and OpEx savings for operators.

The telco cloud is a crucial element in ensuring network capacity and elasticity, as well as the ability to quickly bring new services to market. Inseego supports cloudification through its ongoing collaborations with Ericsson and Nokia and via partnerships with U.S. public cloud providers Amazon Web Services (AWS) and Microsoft Azure. Moor Insights & Strategy believes that Inseego's Azure-based cloud framework and solutions are particularly compelling and will provide the company needed headroom to support current and future 5G-based enterprise services.

CALL TO ACTION

The market needs a domestically sourced end-to-end supply chain to meet the requirements of telecommunications networks in the United States. The exploding growth of cellular devices — including smartphones, tablets, mobile hotspots, FWA customer premises equipment (CPE), and IoT sensors — is making mobile networks more vulnerable to attacks by bad actors. These devices represent the “on-ramp” to both current 4G LTE and future 5G deployments and therefore must meet the highest levels of security and performance. Moor Insights & Strategy believes that Inseego is uniquely positioned to meet these needs, given its proven industry track record, depth of portfolio, technical strength in security and performance, and extensive partnerships with domestic 5G solution leaders.

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