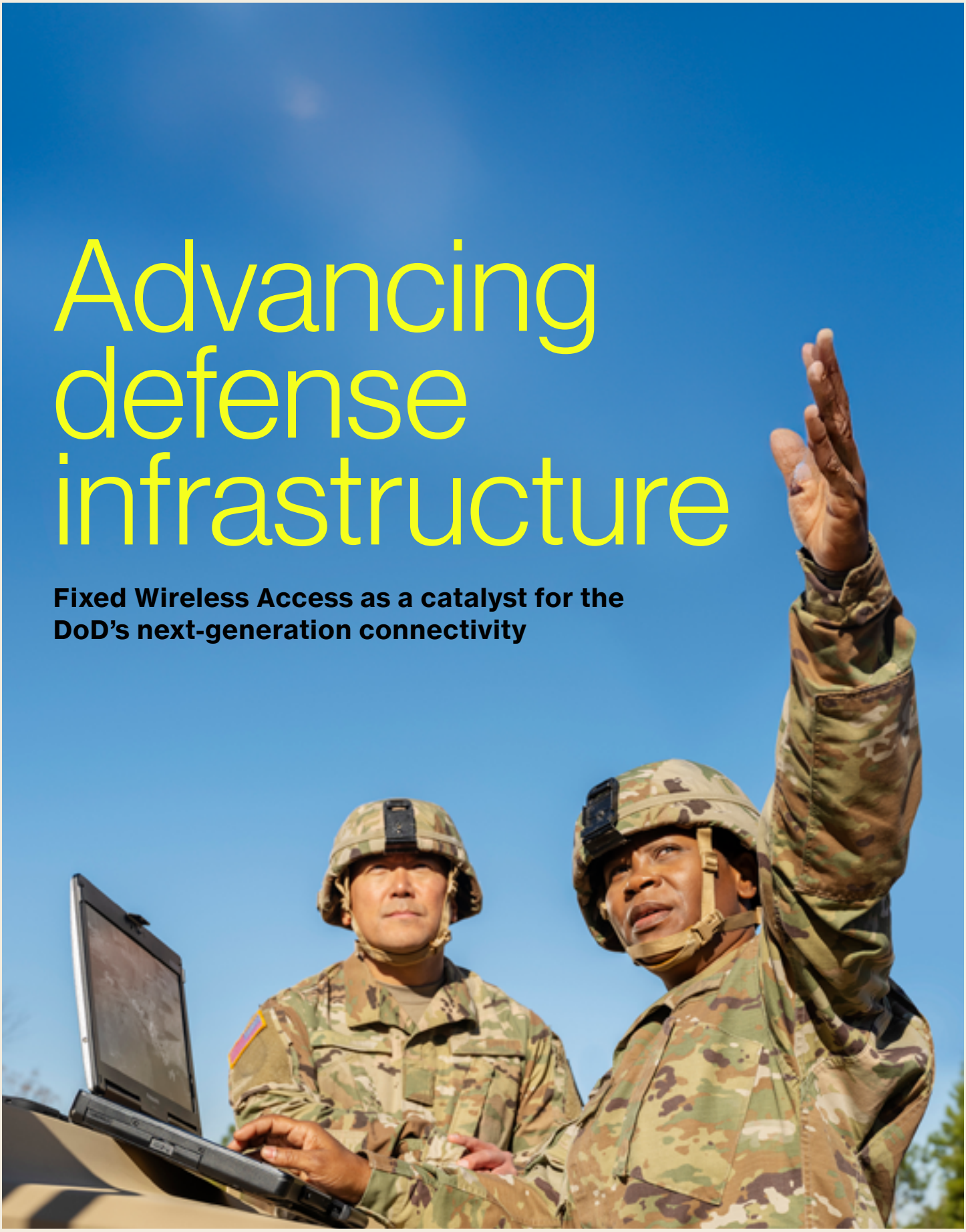
Advancing defense infrastructure

Fixed Wireless Access as a catalyst for the DoD's next-generation connectivity



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"We are at a critical point in our nation's history – it's today's investments in our defense that will ensure the success of our warfighters on the battlefields of the future," stated U.S. Representative Mike Rogers (R-AL), Lead Republican of the House Armed Services Committee, following the signing of the National Defense Authorization Act (NDAA) in December 2023.[1] This landmark legislation, spanning nearly 3,100 pages, includes a directive for the Department of Defense (DoD) to revolutionize connectivity across military installations. The mandate calls for the deployment of private wireless networks that leverage cutting-edge 5G information and communications capabilities alongside Open Radio Access Network (O-RAN) architecture.

These networks represent more than just a technological enhancement, they are a critical component of the DoD's broader strategy to enhance security, improve connectivity, and enable mission-specific functionalities on military bases. The introduction of these advanced networks is a strategic move to ensure that the U.S. military maintains its technological edge in an increasingly connected and data-driven world.

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Challenges faced by the DoD

Outdated infrastructure: Many of the DoD's existing communication systems are based on aging infrastructure that struggles to meet current demands and budgets.

High costs of traditional methods: Deploying traditional communication infrastructure, such as trenching for fiber optics, incurs significant expenses and is often a lengthy process that disrupts operations. This poses a challenge in rapidly evolving military contexts where agility is crucial.

Need for secure, reliable and resilient communications: Given the complexities of today's threat landscape, the DoD necessitates communication solutions that ensure security and reliability while maintaining resilience in diverse, challenging environments. FWA presents a compelling alternative, addressing these challenges by offering flexible, cost-effective, and robust connectivity.

In this context, Fixed Wireless Access (FWA) is positioned as a vital tool in the DoD's modernization efforts. FWA represents a reliable and flexible alternative or even complement to traditional wired infrastructure, particularly in remote or highly secure areas where conventional connectivity solutions may be impractical or prohibitively expensive.

As the DoD moves forward with its connectivity initiatives, FWA solutions stand out as a powerful enabler of this transformation. With the ability to deploy secure, high-speed internet connections rapidly, FWA can support a wide range of military applications, from enhancing base security to enabling critical communications in the field. This white paper explores the role of FWA in the DoD's modernization journey, highlighting its potential to deliver robust, secure, and scalable connectivity solutions that meet the unique needs of defense operations.

Fixed Wireless Access: A versatile connectivity solution

Fixed Wireless Access leverages 4G LTE and 5G cellular networks, to provide internet connectivity. Unlike traditional wired services that require physical infrastructure, FWA can be deployed virtually anywhere and ready within a few days rather than weeks, making it an ideal solution for the fast-past high-stakes demands of the U.S. military. “At the end of the day, all that is needed is a power source, a modem and a wireless business internet SIM card in that modem to get connection to the wireless network. This enables a lot of use cases whether it’s having a data connection fixed in a vehicle or in a static location,” LonGene Leonard, Principal Solutions Architect for 5G and FWA for Verizon, supporting the DoD and National Security, explained.

Key benefits of Fixed Wireless Access include:

- Office in a box
- Network resiliency
- Connectivity in remote locations
- Mobile connectivity
- Copper replacement
- Emergency connectivity

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Wired vs. wireless connectivity

Unlike Traditional wired infrastructure, FWA does not require extensive physical cabling, making it quicker and less costly to deploy. By deploying cost-effective high-gain antennas, it extends coverage to more remote areas and enhances signal strength within buildings, effectively overcoming Wi-Fi limitations. FWA also outperforms satellite-based communications in terms of latency and bandwidth, offering a more reliable and responsive solution for modern applications. This all makes FWA particularly advantageous for military operations that require rapid setup and high-quality communications.

FWA in the context of military operations

FWA offers unparalleled flexibility, scalability, and advanced capabilities in the field that can transform military communications. In the context of military operations, where rapid deployment, mobility, and reliable connectivity are critical, FWA provides an adaptable solution that enhances communication across diverse environments. Whether supporting remote missions or large base operations, FWA helps to ensure that military forces remain connected to make fast, informed decisions in dynamic situations.

Operational flexibility

FWA's ability to be rapidly deployed and adapted to various environments is a significant advantage for military operations. Whether in remote areas or on established bases, FWA can provide immediate and robust connectivity. This flexibility ensures that military units remain connected and can communicate effectively, regardless of their location.

Scalability and mobility

FWA is highly scalable, supporting a wide range of operational needs from small outposts to large bases and installations. Its mobility allows it to be used in mobile command centers and temporary installations, ensuring that connectivity can move with the operation. This adaptability is crucial for the dynamic nature of military engagements, where infrastructure must be as mobile and flexible as the forces it supports.

Enhanced communication capabilities

FWA supports advanced communication capabilities, enabling near real-time data transfer, rapid decision-making, and IoT integration. These capabilities are essential for modern military operations, where timely and accurate information can mean the difference between mission success and delay or failure. FWA's high-speed, low-latency connections help ensure that data is transferred quickly and securely, supporting the DoD's need for operational excellence.

Security and reliability

As the DoD embraces the enhanced connectivity provided by FWA, security certainly remains a paramount concern. Rigorous adherence to stringent security protocols helps ensure that FWA deployments meet the highest standards for data protection and resilience against cyber threats. Network security best practices are leveraged by the DoD through collaboration with industry.

Case studies and use cases

DoD case studies

One example of an FWA use case is in secure access at entry gates on bases. “You have a matter of seconds to scan an ID card and check someone coming on a base. Fixed Wireless Access can help enhance the security in these isolated areas of a base where wired connections aren’t practical,” Leonard says. In addition, FWA supports defense contractors performing maintenance on remote or solar-powered bases, or even simpler everyday functionalities on bases. FWA has also been used in disaster response scenarios, where rapid deployment of communication networks is critical.

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Potential use cases

FWA is highly effective where wired connections are impractical or unavailable, including:

Base connectivity

Seamless communication and data transfer across military bases.

Warehouse/Outdoor operations

Reliable connectivity in large, hard-to-wire areas.

Disaster response

Rapid-deployment networks for emergency scenarios.

Battlefield communications

Secure, real-time communication for troops.

Base life

Supporting critical infrastructure like security and admin systems.

Training

Enabling immersive, real-time training environments.

Mobile military vehicles

Providing secure, on-the-move internet connectivity.

POTS/TDM replacement

Upgrading legacy systems for better speed and reliability.

Implementation consideration

The benefits are clear, but once the decision has been made to implement FWA, several key factors must be considered to ensure smooth and efficient deployment. From strategic deployment planning to analyzing cost benefits and addressing potential challenges, careful preparation is essential to maximize the effectiveness of FWA technology.

Deployment strategies

A successful deployment of FWA within the DOD requires careful planning, including site surveys to identify optimal locations for base stations, spectrum management to ensure efficient use of available frequencies, and integration with existing infrastructure to maximize performance and reliability.

Cost-Benefit analysis

While there is an initial investment in FWA technology, the long-term savings in infrastructure costs, combined with the operational benefits, make it a cost-effective solution. FWA helps reduce the need for expensive and disruptive fiber trenching and offers greater flexibility in deployment, which can lead to significant cost savings over time.

Challenges and solutions

Potential challenges in implementing FWA include spectrum availability, interference from other wireless networks, and the need for specialized equipment. These challenges can be mitigated through careful planning, investment in high-quality equipment, and ongoing monitoring and management of the network.

Future of FWA in DoD modernization

As defense operations increasingly rely on agile, secure, and high-speed communication solutions, FWA emerges as a key technology capable of transforming connectivity. With advancements in 5G driving FWA's evolution, this flexible and scalable solution is set to enhance the DoD's ability to stay ahead of emerging challenges, streamline operations, and support next-generation technologies essential for maintaining strategic superiority.

Evolution of FWA technology

The future of FWA is closely tied to the proliferation and advancements in 5G. As 5G networks continue to evolve, FWA will benefit from increased speeds, lower latency, and enhanced capabilities. These advancements will further solidify FWA's role in the DoD's modernization efforts, enabling even more sophisticated applications and use cases.

Long-Term impact on DoD operations

The adoption of FWA can have a profound long-term impact on DoD operations. By providing a flexible, scalable, and secure communication solution, FWA could enhance the DoD's ability to respond to emerging threats, support advanced technologies, and maintain operational superiority. As FWA technology continues to evolve, its role in the DoD's modernization strategy will only grow, offering new opportunities for innovation and efficiency.

Embracing FWA: Fixed Wireless Access as a cornerstone for defense modernization and operational superiority

Fixed Wireless Access is a transformative technology that offers the Department of Defense a unique combination of flexibility, speed, cost-effectiveness, and support for advanced technologies. By leveraging FWA, the DoD can overcome many of the challenges associated with traditional communication infrastructure and achieve its modernization goals more effectively.

As the DoD continues to modernize its infrastructure, FWA should be considered a cornerstone of its communications strategy. The benefits of FWA – enhanced operational capabilities, strategic advantages, and long-term cost savings – make it an essential component of the DoD's efforts to maintain its technological and operational edge.

Learn more.

Experience how Verizon is helping transform the DoD. Strategically and securely.

Contact your Verizon Account Representative today at 1.877.297.7816 or visit verizon.com/defense.