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About outlooks  
Deloitte's 2022 telecom industry outlook seeks to identify the strategic issues that telecom organizations should consider in the coming year, including their impacts, key actions to take, and critical questions to ask. The goal is to equip telecommunication organizations with the information needed to position themselves for a strong, resilient future.

# Executive summary

The telecom sector continued to make progress in augmenting its network capacity with additional fiber and wireless deployments to meet the constant demand for higher-speed networks in 2021.

However, as we start the new year, we see an emerging set of issues and opportunities presented by a dynamic regulatory, technological, and competitive environment that may influence the sector's progress in the coming year.

Our 2022 outlook in brief:

- **The potential for more competitive broadband markets.** Faster mobile and fixed wireless connections create more viable alternatives to wired connections and new opportunities for bundled service offerings and business models for service providers. With ever-expanding options for high-quality communication and internet services from telecom, cable, wireless, and satellite internet providers, consumers will enjoy enhanced flexibility in purchasing and consuming services in the new year. However, these trends may also lead to a more competitive environment in 2022.
- **A shift to more decentralized government broadband infrastructure funding.** The \$1 trillion Infrastructure Investment and Jobs Act (IIJA) passed in November earmarks \$65 billion for continued broadband adoption and deployment. While government programs dedicated to expanding and improving telecommunication infrastructure and services have traditionally been managed at the federal level, it appears the bulk of the bill's federally allocated broadband dollars will flow through more decentralized state-based models.

- **Rising interest in multi-access edge computing and private cellular networks.** The enterprise market for private cellular networks and edge computing is gaining momentum. The market is still nascent but promises to be competitive, with many different players vying for their share. Network operators will have to compete against other players, who may prove key partners in delivering their solutions. Ecosystem players will likely begin to stake out and define their role in this emerging but rapidly evolving market in the coming year.
- **The need to reassess cybersecurity and risk management in the 5G era.** While the widespread adoption of 5G offers many benefits, it also creates new security concerns and challenges. As operators have taken steps to evaluate and minimize threats arising from 5G and software-centric networks in their own organizations, they are in a unique position to offer 5G security services to enterprises seeking to deploy their own advanced wireless networks. Thus, as we enter the new year, many operators may desire to reassess, reimagine, and reinvent their cybersecurity and risk management programs and offerings.




# The potential for more competitive broadband markets

According to our research, many consumers increasingly perceive little-to-no difference in the performance between their mobile and home Wi-Fi connections. Our analysis reveals that more than half of surveyed respondents feel that their smartphone delivers the same or faster speeds than their home Wi-Fi connection for two Deloitte studies running.<sup>1</sup>

Thus, while most consumers currently use Wi-Fi enabled by a wired cable or fiber connection to access the internet, many users, particularly younger generations, are turning to their mobile data plans for internet access. Millennials and younger consumers are roughly twice as likely to rely on their mobile data plans, either through their smartphones or a mobile hotspot, than their older cohorts for internet access. With the introduction of unlimited mobile plans<sup>2</sup> and speed tests measuring mobile download speeds hitting an average of 100 Mbps,<sup>3</sup> it's little wonder that there is less need for smartphone users to switch to their home Wi-Fi.

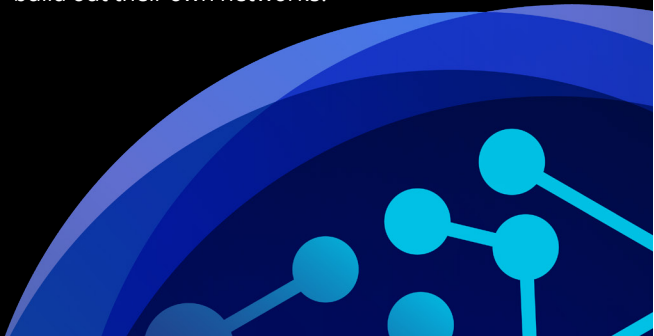
The introduction of 5G fixed wireless access (FWA), which has the potential to match and even surpass the performance of today's wired broadband connections, may accelerate the consumer trend toward wireless. But because 5G FWA can create more choices for consumers when deciding how and with whom to connect to the internet, it may also accelerate industry competition and pricing pressure for broadband internet services.

Cable and telecom companies continue to target customers with increasingly similar product offerings centered on broadband internet and mobile-service bundles. At present, even as telcos continue to replace their legacy copper wireline networks with fiber, cable often has a footprint advantage in delivering faster broadband services. Despite aggressive expansion programs, telco fiber coverage is still a fraction of their core wireline or wireless footprints, limiting bundling capabilities. However, as economics and ease of use improve, 5G FWA can help put telcos on equal footing. 5G FWA enables operators to offer competitive fixed broadband internet services to areas where fiber is either unavailable or too expensive using their nationwide mobile infrastructure.<sup>4</sup> Whether through mobile hotspots, fiber footprint expansion, or 5G FWA rollouts, the ability of telcos to compete in the home broadband services market appears to be rising.



Strategic questions to consider:

- With spectrum being a scarce resource, how can operators prioritize its use to maximize its value?
- How can operators use FWA to create additional synergies between their wireless and fiber asset deployments to improve their cost structure and benefit customers?
- While telcos may initially benefit as a wholesale provider of wireless capacity, what are the long-term consequences if mobile virtual network operators begin using their wireless scale to build out their own networks?



# A shift to more decentralized government broadband infrastructure funding


The \$1 trillion Infrastructure Investment and Jobs Act (IIJA) bill that passed in November includes \$65 billion in spending to support greater broadband deployment and adoption. Government programs dedicated to expanding and improving telecommunication infrastructure and services have largely been managed at the federal level over the past decade—mainly through the Federal Communications Commission (FCC), Housing and Urban Development (HUD), US Department of Agriculture (USDA), and National Telecommunications and Information Administration (NTIA).<sup>5</sup> The administration of the broadband funding per the enacted IIJA, however, will primarily flow to the states through federal grant programs.<sup>6</sup>

The bulk of dollars newly allocated for broadband investment will flow primarily to states via NTIA block grants. To obtain funds, states must submit a five-year action plan on how they intend to close the digital divide with input from specific local and regional stakeholders.<sup>7</sup> States would then use grant funds to award subgrants to qualifying broadband projects competitively. But how each state administers and manages these funds is likely to vary widely, as allotments typically occur through a patchwork of disparate agencies and organizations.

Unlike federal entities that tend to favor a familiar roster of established private players, state-based and local agencies often take a more varied approach. They can open funding to alternative organizations, including electric cooperatives, municipal broadband initiatives, and regional public-private partnerships. Although several states prohibit funding of public broadband networks to promote private investment and innovation,<sup>8</sup> it stands that state prioritization of regional and community-based providers could fragment and distribute the market.<sup>9</sup>

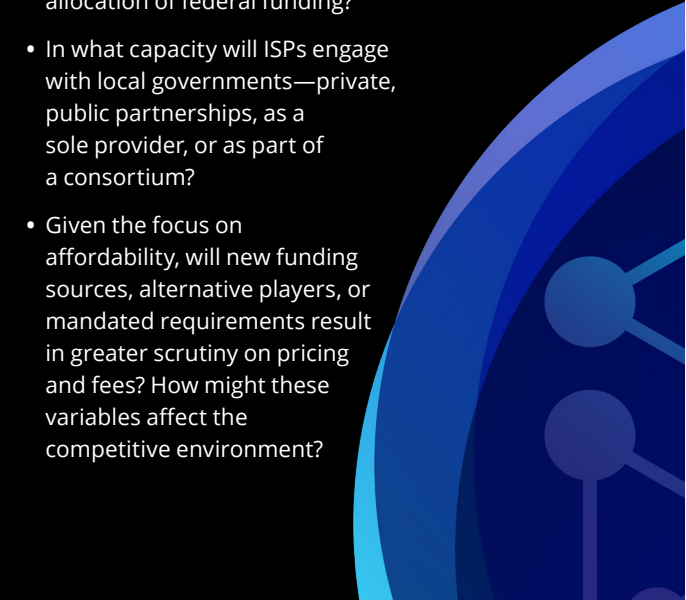
Though federal programs have traditionally favored wired solutions, states are increasingly technology-agnostic in awarding grants as long as a service can meet minimum performance thresholds. This trend opens the field to new players, including entrepreneurial FWA and low-earth-orbit satellite internet service providers. However, the new law raises the minimum performance threshold from 25 Mbps download and 3 Mbps upload speeds to 100 Mbps and 20 Mbps, respectively, potentially eliminating companies that rely on older technologies.

Many telecom organizations may not be fully equipped to shift to a more decentralized state-managed and potentially more competitive award program. As a result, there will be a need to develop more nuanced methods to keep abreast of many local funding mechanisms and grant programs, evaluate which programs are worth pursuing, and monitor compliance with local terms and conditions.



Strategic questions to consider:

- How must telco policy organizations reorient themselves to address more decentralized allocation of federal funding?
- In what capacity will ISPs engage with local governments—private, public partnerships, as a sole provider, or as part of a consortium?
- Given the focus on affordability, will new funding sources, alternative players, or mandated requirements result in greater scrutiny on pricing and fees? How might these variables affect the competitive environment?



# Rising interest in multi-access edge computing and private cellular networks

Enterprise interest in 5G edge computing applications and private cellular networks is beginning to emerge. Lured by the potential benefits of new advanced use cases, enterprises and organizations are evaluating the adoption of private cellular networks enabled by the confluence of greater spectrum availability, 5G wireless technologies, distributed edge computing architectures, and AI-driven applications.<sup>10</sup>

The supplier ecosystem and business model for delivering enterprise-oriented 5G edge computing and private network solutions are undefined and fluid. However, they might begin to solidify in 2022, with potential winners emerging. As a result, operators should act quickly to define how they should best participate in this emerging market.

While there is a clear role for telcos to play, their success is not guaranteed. Many players—including networking equipment companies, hyperscalers, system integrators, and others—are vying for their market share and approaching the same large enterprise customers as the telcos. Therefore, MNOs will have to compete against other industry players, who may also be key partners in delivering parts of the telco solution.

Effective partnering and ecosystem development may feature prominently to get to market and capture value as quickly as possible. There is a rich ecosystem of potential partners that telcos can work with to build out and deliver their edge presence, platforms, and applications (without relinquishing control of their network). But many partners are also potential competitors feeding concerns that partnering will limit the value telcos can extract from these new markets.

Many customers are already developing preferences for specific vendor management tools and development platforms. In this environment, if telcos do not move quickly to stake out and define their role, others may dictate it for them.



## Strategic questions to consider:

- What should the telco's role be in developing and delivering 5G private cellular networks and enterprise-oriented edge solutions? Will it take the form of spectrum leases, fiber backbone, and backhaul, or something more?
- What are the telco's core competencies and value proposition in delivering 5G enterprise networks? Which business models will allow telcos to optimize value?
- What capabilities are required to execute on a given strategy or business model? Can telcos develop new capabilities internally? To what extent should they pursue acquisition or partnering strategies?

# The need to reassess cybersecurity and risk management in the 5G era

While adopting 5G creates several benefits, it also brings new security concerns and challenges. While operators have taken steps to evaluate and minimize threats in their own organizations, they are in a unique position to offer 5G security services to enterprises seeking to deploy their own advanced wireless networks. According to a Deloitte poll, approximately 80% of executives at organizations considering 5G adoption express security as a top concern.<sup>11</sup>

As networks become more software-based and decentralized, their surface attack area and points of entry only increase. For example, 5G networks can support a vast number and types of devices with varying performance and service requirements. As a result, the speed, volume, diversity, and sensitivity of data running over networks are set to explode. And while 5G's more decentralized networks can help alleviate redundancy, privacy, and data sovereignty concerns, they can also complicate and intensify the risk of data mismanagement.

In addition, the Biden administration is stepping up its focus on fixing cybersecurity flaws within US government agencies. These requirements will likely filter down to private companies doing business with federal agencies, who will then be required to provide demonstrable protection against malicious intrusion by cyber actors seeking to compromise networks and steal data. Recommendations include encouraging zero trust principles that assume networks are already compromised and thus focus on continuous logging and monitoring to lock down further intrusion.

A software-centric environment will require regular updates to cyberthreat intelligence, data security, and risk management programs as new releases become available.<sup>12</sup> In addition, the sheer volume of data, devices, and policy changes may necessitate leveraging artificial intelligence and machine learning (which introduce additional risk sources) to decentralize and automate areas like security policy configuration, compliance monitoring, and threat and vulnerability detection. As a result, many operators may have to reassess, reimagine, and reinvent their security management programs in response to these 5G security challenges.

But new threats go beyond cyber. 5G adoption also introduces new enterprise vendors, alliances, and ecosystem partners, creating new dependencies and third-party risks to manage. Greater industry collaboration in the co-creation of new 5G-enabled solutions, for example, can also expose operators to potential unforeseen liabilities. Furthermore, stakeholder definition can be more

challenging in the 5G versus 4G ecosystem with greater prevalence of more complicated B2B2C (versus B2B or B2C) selling models.

For many organizations eyeing 5G, however, hiring and upskilling the right talent poses one of the most significant challenges. Adoption will require appropriately skilled security professionals for the successful operationalization of 5G.



## Strategic questions to consider:

- How can telcos use their approach to cybersecurity as an opportunity to differentiate themselves and capture value in the 5G enterprise market?
- Where can telcos switch from reactive security mechanisms to more proactive ones?
- As telcos migrate from legacy networks to modern architectures, do they have appropriate risk management and governance organizations in place?



# Signposts for the future

In 2022, the telecom industry will face new opportunities and challenges presented by a dynamic regulatory, technological, and competitive environment. The IIJA will infuse the sector with massive new funding promoting greater broadband deployments and adoption.

Faster 5G mobile, 5G FWA, and satellite services will create more consumer options for connecting to the internet, likely increasing competition. Next-generation applications arising from the confluence of faster and more reliable 5G connectivity, distributed computing, and artificial intelligence will spark growing enterprise interest in multi-access edge computing and private cellular networks. These new networks, services, and applications will require more proactive measures to strengthen against cyberthreats.



For 2022, we recommend that telecom organizations:

- Reassess core value proposition in an evolving competitive landscape with more players vying for the same customers.
- Determine organizational effectiveness in monitoring and responding to more distributed, state-based mechanisms for awarding federally allocated broadband funds.
- Reevaluate how and where to participate in terms of both service offerings and geographies.
- Monitor ecosystem and business model development in the emerging 5G enterprise edge compute and private cellular network markets.
- Look for ways to differentiate services on nonperformance attributes since consumers perceive minor differences among provider offerings.
- Build on the unique position to offer differentiated 5G security and risk management services to enterprises seeking to deploy advanced wireless networks.

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# Endnotes

1. Chris Arkenberg et al., "[2021 Connectivity and Mobile Trends Survey](#)," Deloitte Insights, 2021.
2. While marketed as unlimited, these plans are typically still subject to data caps. See Allison Johnson, "[Cellphone fine print, explained](#)," *Verge*, March 31, 2021.
3. "[United States' mobile and fixed broadband internet speeds](#)," Ookla, accessed October 2021.
4. Naima Hoque Essing et al., "[Fixed wireless access: Gaining ground on wired broadband](#)," Deloitte Insights, December 1, 2021.
5. Jack Fritz and Dan Littmann, "[Broadband for all: Charting a path to economic growth](#)," Deloitte, April 2021.
6. John Cassidy et al., "[Closing the digital divide](#)," Deloitte Insights, December 1, 2021.
7. [Infrastructure Investment and Jobs Act](#), H.R. 3684, 117th Congress (2021).
8. Tyler Cooper, "[Municipal broadband is restricted in 18 states across the U.S. in 2021](#)," BroadbandNow, December 1, 2021.
9. Matt Kapko, "[Will infrastructure bill reshape America's telecom market?](#)," SDxCentral, September 23, 2021.
10. Jack Fritz et al., "[5G edge: Invest today for tomorrow's competitive advantage](#)," *Wall Street Journal*, August 3, 2021.
11. Deloitte, "[With 5G adoption come new cybersecurity risks to mitigate](#)," press release, December 7, 2020.
12. Deloitte, "[The need for 5G speed hinges on cybersecurity](#)," *Wired*, accessed December 14, 2021.



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