ctia

Wireless & AI

Driving the Future of Innovation

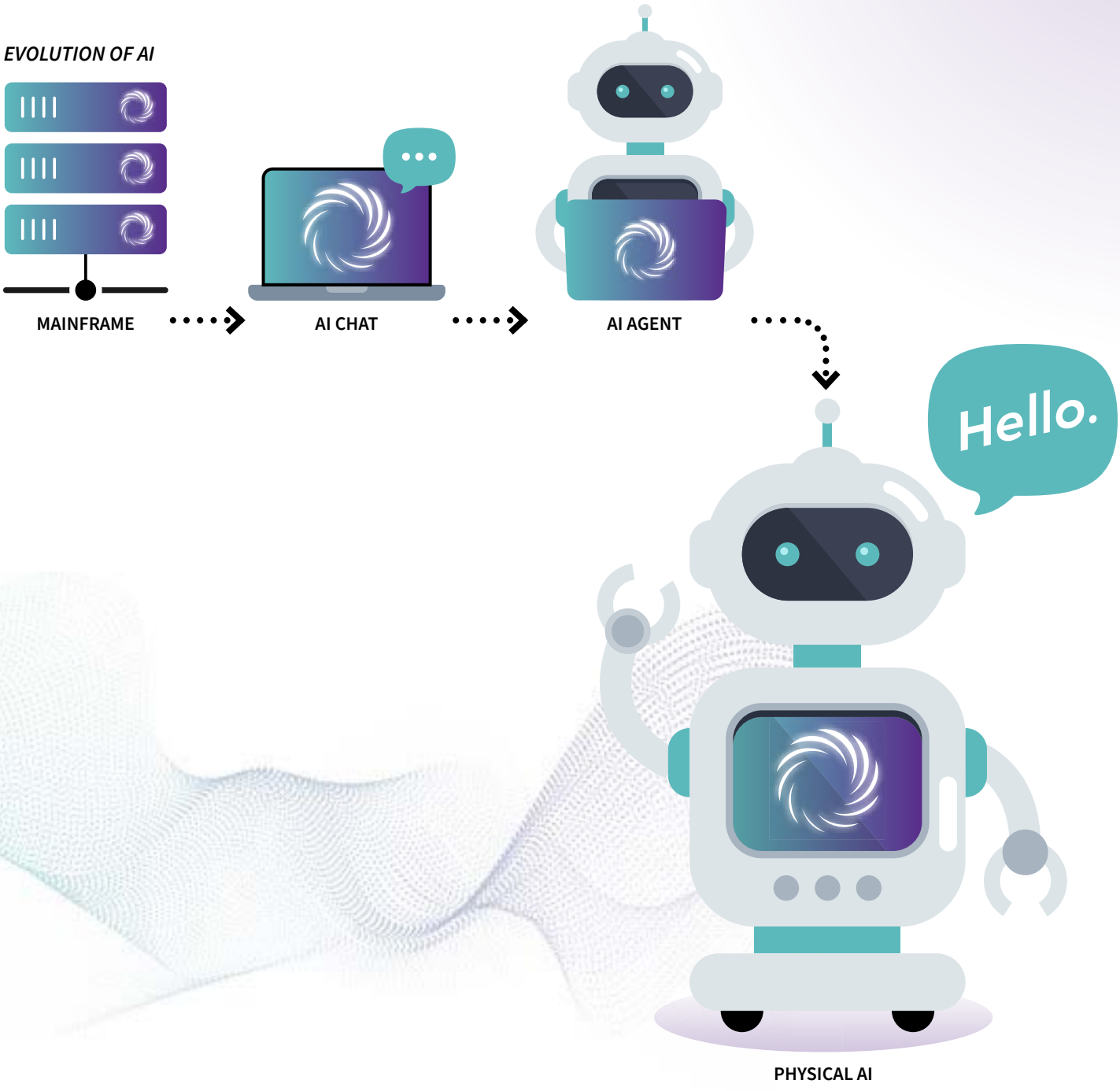
> "The next generation of mobile communications networks (6G) will be foundational to the national security … of the United States. This technology will play a pivotal role in the development and adoption of emerging technologies like artificial intelligence…"
>
> **— PRESIDENT DONALD J. TRUMP**
> (DECEMBER 2025)

Executive Summary

Wireless and AI are rapidly evolving together with greater reliance upon the other to drive future innovation. To secure U.S. leadership, policymakers should view these technologies through the lens of one unified strategy. AI requires wireless networks to move data, help coordinate real-time decisions, and operate effectively with the physical world. In turn, wireless networks rely on AI to manage the surging complexity and record traffic driven by AI's own insatiable data demands. This convergence should inform our nation's wireless and AI strategy.

Taken together, it is now clear that AI traffic will strain existing wireless networks before the decade is out with huge new data needs, entirely new traffic patterns, and novel demands on wireless networks to do more than simply carry traffic. Accenture cautions this could be a $1.4 trillion drag on the U.S. economy if this bandwidth bottleneck is not addressed expeditiously.

Meeting the connectivity demands of our AI future will require new spectrum—larger, contiguous blocks across key mid-bands—and investment-friendly policy that enables both AI and wireless infrastructure to be built at the industrial scale of our AI ambitions. It will also require emerging 6G networks to be AI-native from the ground up with embedded intelligence to dynamically allocate spectrum, anticipate congestion, sense the physical environment, coordinate edge-compute workloads, and secure devices—all at machine speed. The country that leads the AI and wireless convergence will control the innovation platform of the future.



AI Is Moving Out of the Data Center

AI did not start in your pocket. It started in research labs with scientists training models on specialized hardware, refining algorithms far from everyday use. Large language models changed everything. AI moved out of the lab and into massive data centers, and suddenly anyone could use it—to answer questions, generate content, and build new services. But that was just the beginning. AI agents are now learning to plan, reason, and act—operating autonomously with minimal human oversight. Some of these agents are already on your smartphone, with more to come. The next step will be even more transformative: AI will move into the physical world.

WIRELESS EVOLUTION

1G VOICE

2G TEXT

3G EMAIL

4G VIDEO

5G IoT

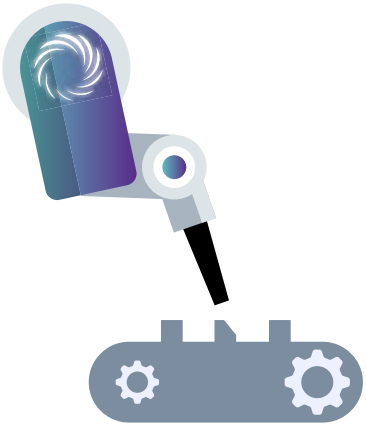
6G INTELLIGENCE

Wireless Will Be More Than Talk, Text, and Data

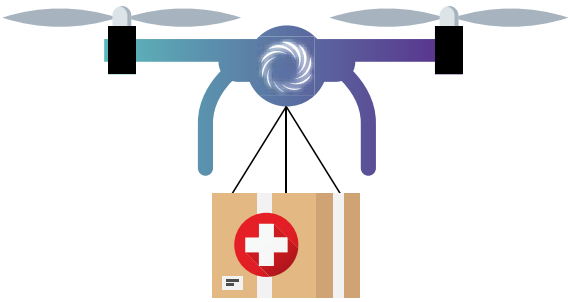
Wireless networks are also evolving. Early networks carried voice. Then text. 3G put the internet in your pocket. 4G made smartphones the center of daily life—streaming, apps, and always-on connectivity became the norm. 5G pushed further, expanding beyond phones to home broadband, connected vehicles, industrial equipment, and smart infrastructure. 5G Advanced is now driving this first wave of AI innovation. All of this is prologue to a new AI-native platform. That's 6G. 6G is being designed for what comes next: a world where intelligent devices, physical sensors, and digital services all need to talk to each other instantly, reliably, and at massive scale. We are re-imagining wireless networks for AI with AI.

Integrated Sensing
Fleets that see and decide together

Ultra-Low Latency
Human-precision control from anywhere



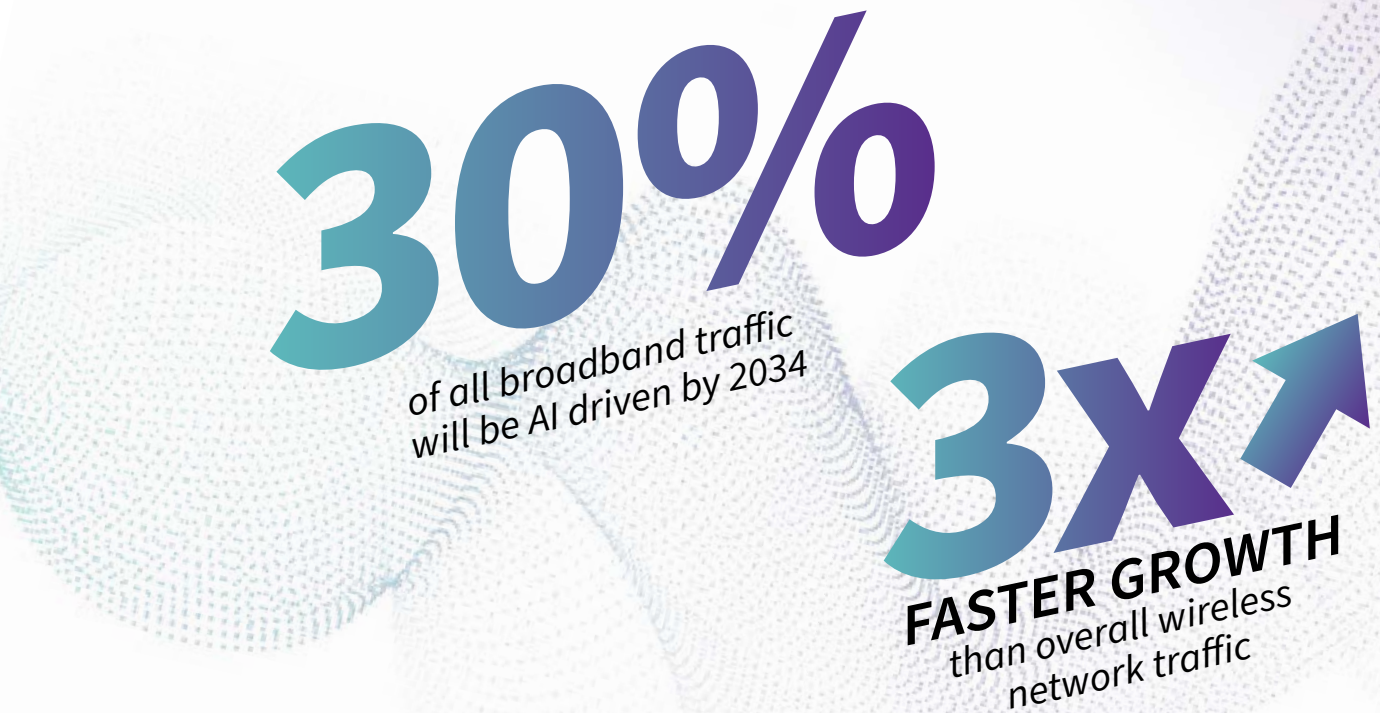
Distributed Intelligence
Factories that fix themselves



Machine-to-Machine Connectivity
Drones that help disaster response

Physical AI: Where Wireless Convergence Happens

Physical AI isn't a future concept. It's already taking shape. AI will go from agents doing tasks in the digital world to completing real-world tasks alongside us. Integrated wireless sensing will help robots perceive and coordinate across entire fleets in real time. Distributed intelligence across device, network edge, and cloud will allow industrial facilities to predict failures and adjust production without stopping the line. Direct machine-to-machine (M2M) coordination will allow emergency drones to respond to disasters with situational awareness. What these systems will all share is a reliance on advanced wireless connectivity with no margin for error.



> "We want AI to develop in the U.S. . . . , but to do that, we must make sure that it works on our mobile networks. . . . We have to have the spectrum [and] the necessary infrastructure so that AI can be mobile."
>
> **— BRENDAN CARR**
> CHAIRMAN, FCC

AI Is Driving Unprecedented Wireless Demand

As AI moves beyond the data center, it is generating data at an unprecedented scale. The U.S. recorded its largest ever year-over-year jump in wireless data traffic last year, and AI is accelerating that trend. Images, video, sensor readings, telemetry—AI workloads are data-intensive by nature. As AI embeds deeper across industries and households, that load will increase exponentially even as on-device AI processing grows dramatically alongside this trend. Overall, AI-related wireless traffic is projected to grow three times faster than overall wireless network traffic—and will make up nearly a third of all broadband traffic by 2034. Wireless operators will need more spectrum and more infrastructure to both keep up with greater capacity and deliver the reduced latency AI applications will demand.

AI Will Generate Entirely New Wireless Traffic Patterns

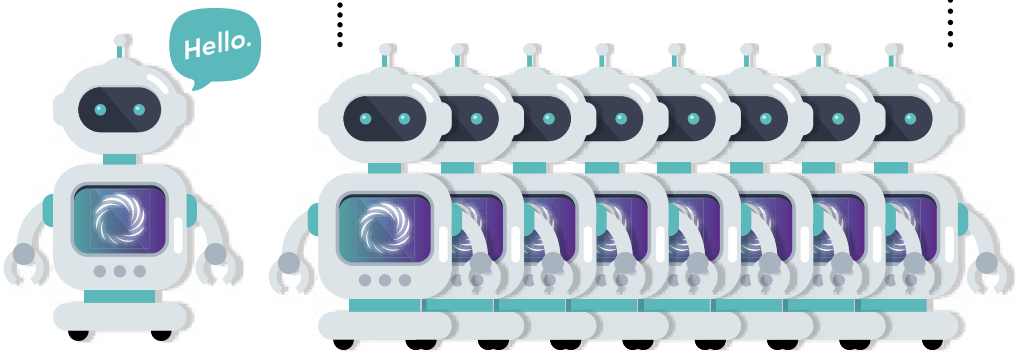
More traffic is only part of the story. AI changes the nature of traffic too. Traditional networks were built to make it quick and easy to download data or watch a video. AI changes the equation. Far more data than ever before needs to move in the other direction, uploaded from devices to the network, to the data center, or to another device. New wide and contiguous spectrum bands will be needed for operators to upend 30 years of network design for this sea change in greater two-way communication.

AI Traffic Requires Enhanced Wireless Network Optimization

Unlike traditional mobile data, AI traffic is also harder to predict than voice, text, or your latest Netflix binge. It's bursty, event-driven, and can spike across a wide set of devices simultaneously. Further complicating the challenge is machine-to-machine communication—AI systems talking directly to other AI systems—which will increase eightfold. This isn't just more traffic on existing networks. It's a fundamentally different kind of traffic requiring new tools and network management techniques that can adapt and move as quickly. This will require new AI-native 6G networks to support the proliferation of intelligent sensors, vehicles, and machines, all demanding simultaneous network access for those functions too costly or complicated to be done on the device.

2.6x
MORE
uplink traffic driven by AI

8x
MORE AI-DRIVEN
machine-to-machine traffic



30%

OPERATIONAL EFFICIENCY

gains from AI-native 6G networks

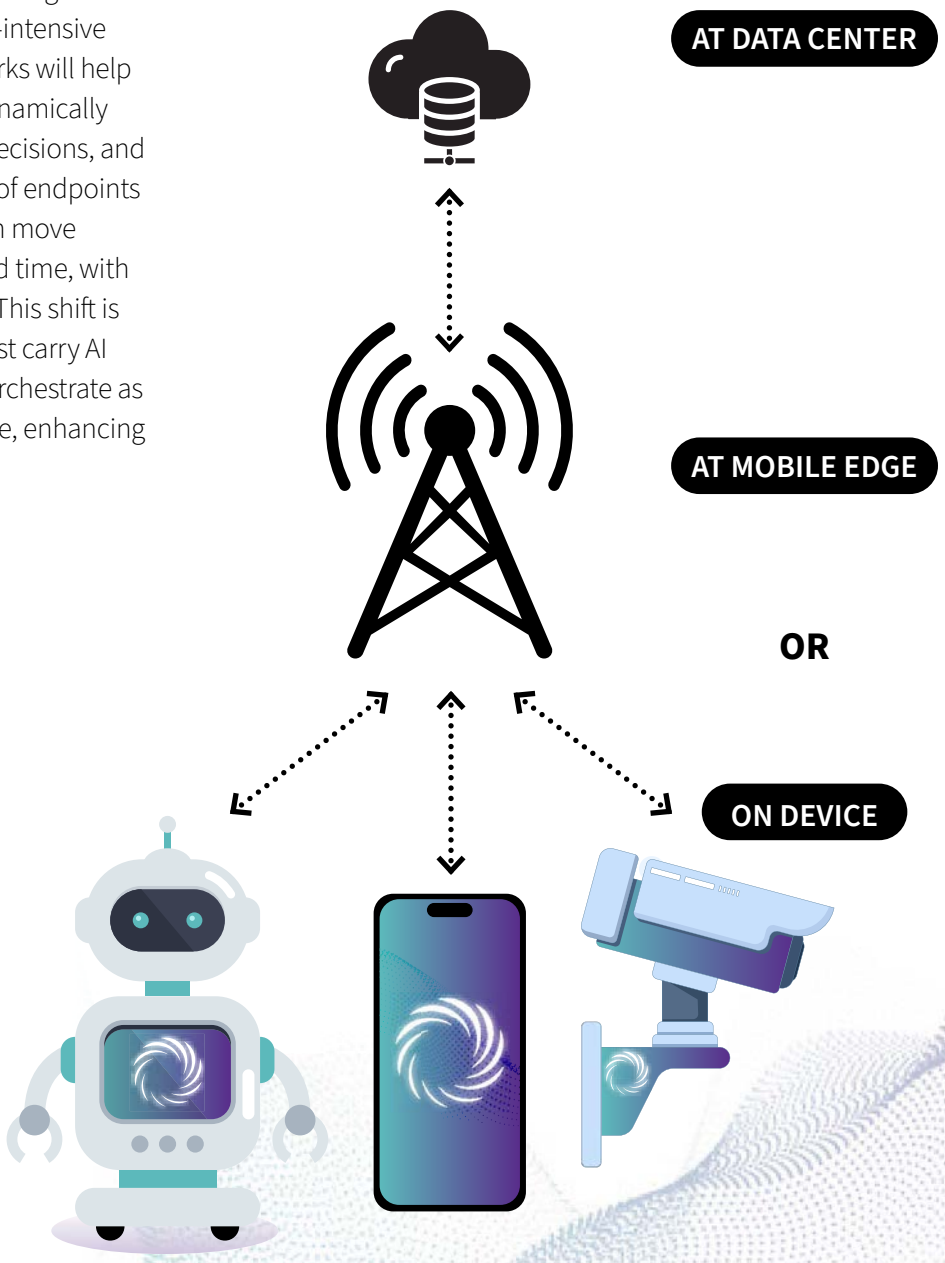
6G: AI Networks for AI Innovation

AI demands on wireless connectivity will also require a fresh approach to network operations. The network's complexity increasingly cannot be resolved by humans manually reacting to data flows that move faster than human reaction time. AI is already helping manage 5G Advanced networks today, with positive results. 6G networks are being designed with new intelligence embedded directly into the radio layer itself, dynamically allocating spectrum, predicting congestion before it happens, authenticating devices automatically, and coordinating edge-compute workloads in real time. 6G networks won't wait for a problem. They will anticipate and adapt as AI-native applications. The result is not just better performance. It is a fundamentally more efficient system that will deliver 30% gains in operational efficiency. We will need all these gains—and more—to meet future demand. The trick is we will need the new wide spectrum bands ready to deploy 6G alongside 5G when the 6G standards are ready in just a few short years to fully realize these gains.

Wireless Adds Connectivity Layer for Distributed AI

The original model was simple: AI lived in the cloud. Send data up, get answers back. That's changing fast. AI needs to operate across three layers—devices, edge, and cloud—each handling different tasks based on the speed, complexity, and cost. Devices will do a lot more than today and handle instant, local decisions. Edge computing will process workloads that are too demanding for devices and too time-sensitive for the cloud. Cloud computing will handle the most complex and data-intensive tasks. In this model, wireless networks will help serve as the coordination layer—dynamically routing workloads, synchronizing decisions, and managing compute across billions of endpoints in real time, so that a single task can move fluidly across devices, locations, and time, with the network holding it all together. This shift is fundamental. The network won't just carry AI traffic anymore. Wireless will help orchestrate as the connective tissue of our AI future, enhancing security, resilience, and reliability.

WIRELESS HELPS ORCHESTRATE AND COMPUTE AT THE RIGHT LEVEL

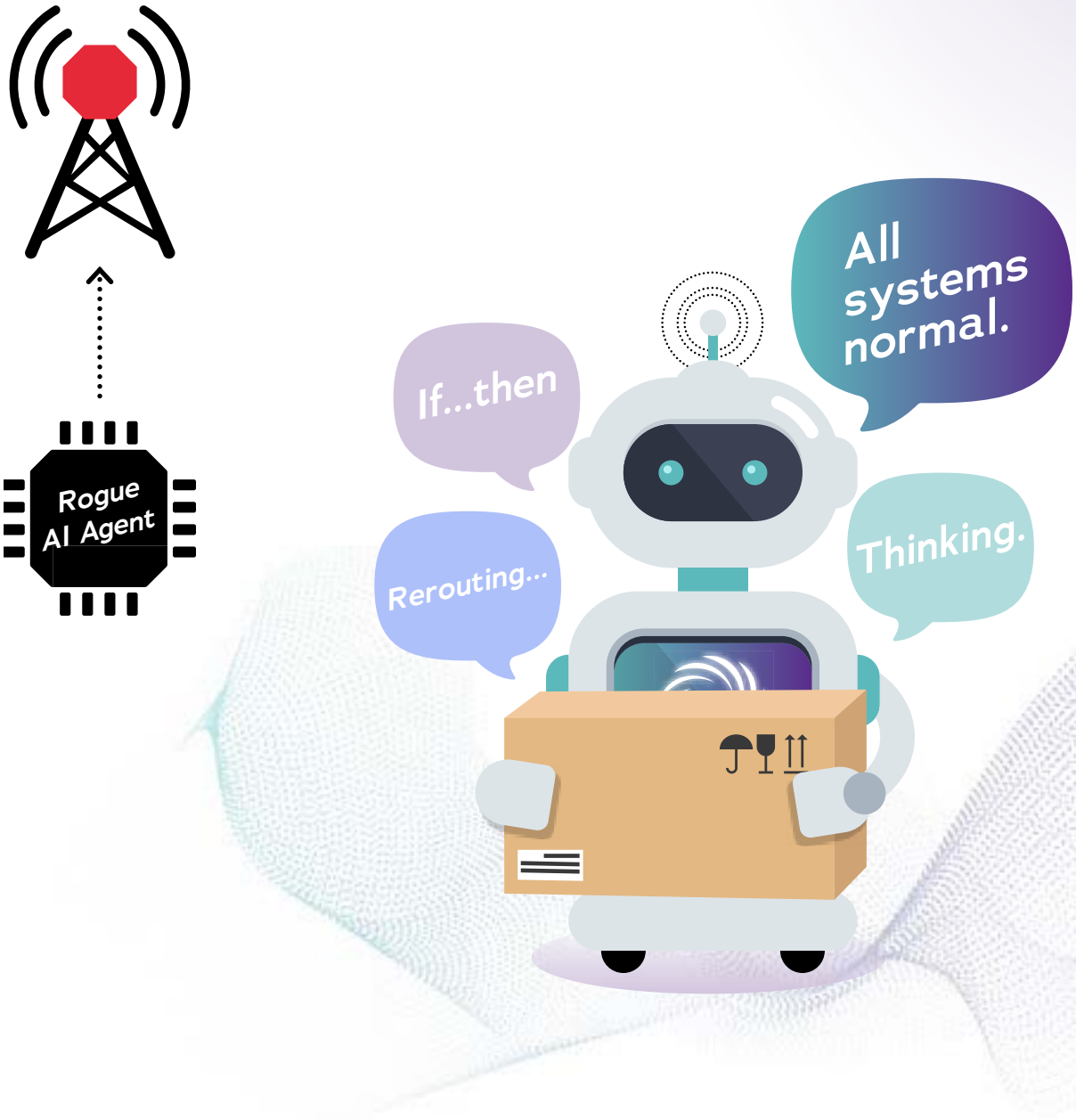


75%

of phones will be AI-powered in two years

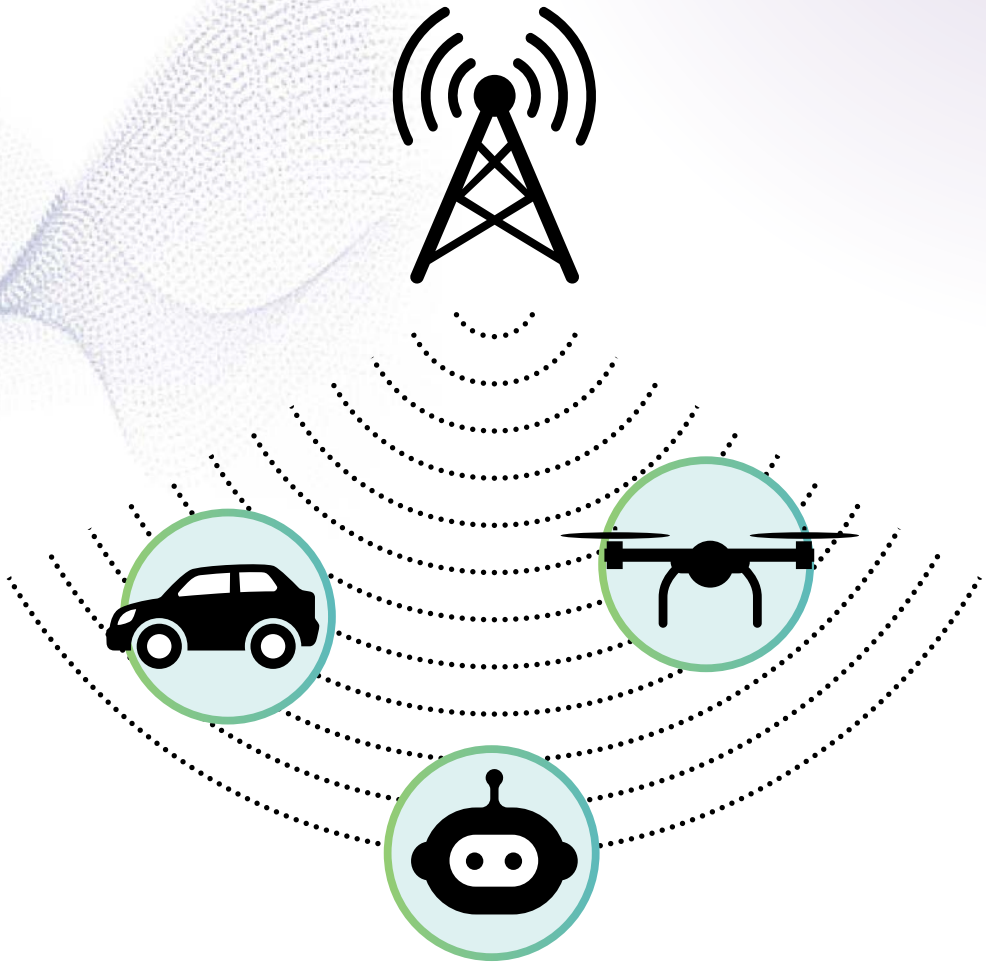
AI in Your Pocket

Your next smartphone is very likely to have advanced AI capabilities. In two years, 75% or more of America's smartphones will have a dedicated high-performance NPU built in. By moving computing and inference power to your device, the wireless industry will help usher in significant new capabilities and reduce the demands on data centers for a whole host of existing and novel applications. Leading AI providers are already launching features that let users dispatch complex tasks from their phones and return to completed work, with AI agents navigating files, browsers, and applications autonomously across users' other devices on their behalf. Your smartphone is becoming the place from which you orchestrate personal AI agents acting across every screen, app, and device in your life.



Securing Our AI Future

Network security and authentication will take on even greater prominence as we shift toward physical AI. If your chat is hacked, you lose data. If a physical AI is hacked, you lose control of a multi-ton machine in a crowded room. We will need agents and machines to know which other agents or machines are known and trustworthy. Alongside other tools, wireless networks can help contribute to safeguarding this new ecosystem. For example, the wireless signal could help verify a robot's or agent's identity as part of the broader security and authentication architecture.



> ISAC "unlocks military applications, like … threat detection in contested domains … [and] advances the sophistication of smart infrastructure, like bridges that monitor their own structural health or highways that can detect accidents in real time."
>
> **— OLIVIA TRUSTY**
> COMMISSIONER, FCC

Wireless Can Be AI's Eyes and Ears

One emerging 6G capability is Integrated Sensing and Communications, or ISAC. With ISAC, the network itself will complement, supplement, and, in some instances, even replace a device's camera or sensors. Radio wave reflections historically were treated as unwanted noise. Soon, those wave reflections may help track movement, detect obstacles, and navigate the physical world. Large spectrum blocks will be critical to deploying these capabilities. The commercial and military applications of this capability could be a game changer.

30%
REDUCTION
in wireless energy

95%
REDUCTION
in AI energy

Addressing the Energy Challenge Head-On

There is a lot of focus on the growing energy demands around AI technologies. The benefit of AI and wireless integration is greater energy efficiency for both platforms. For wireless, AI promises far more efficient operations that translate directly to reduced energy demand. 6G networks are projected to deliver up to a 30% reduction in total network energy consumption through AI-driven resource allocation. Today's wireless networks tend to be "always on." AI will allow cell towers to match power consumption and capacity to meet the exact traffic flow in real time, eliminating idle power waste. In turn, wireless can help push AI inference toward the user—whether on the device or the network edge—which reduces energy consumption by up to 95% compared to running the same query to the cloud, minimizing both backhaul energy costs and the cooling costs of AI data centers.

20%

MORE TRAFFIC
than projected due to AI growth

1/3

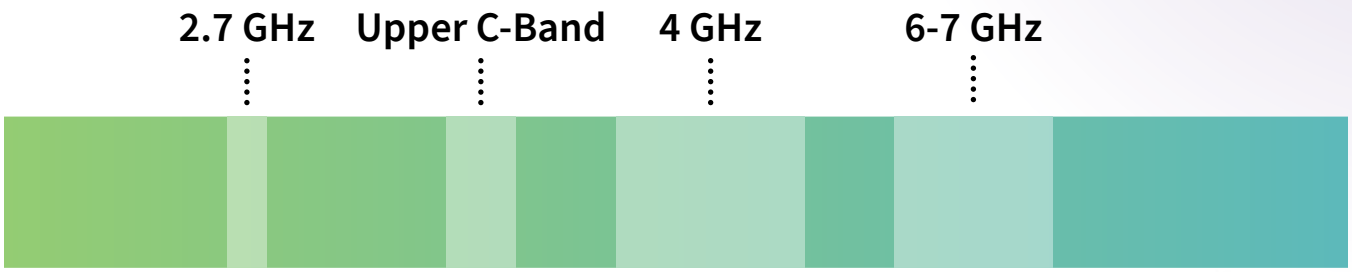
AI TRAFFIC UNMET
by decade's end

> "To realize AI's full potential—and ensure AI benefits us all, not just the few—we must act with urgency to close the digital divide by investing in the infrastructure and skilled workforce that underpin AI's success … Universal connectivity is the building block for universal AI access."
>
> **— REPRESENTATIVE DORIS MATSUI D-CA**

The Wireless Bottleneck Risk to Our AI Future

AI traffic is not just surging—it's growing so fast that wireless traffic forecasts are already being revised upward by 20% from projections made just years ago. The real number may well be much higher. Networks in high-traffic areas are at risk of hitting peak capacity for AI traffic before the decade is out. Accenture projects one-third of AI traffic needs could go unmet. And the economic consequences of a bottleneck are severe—$1.4 trillion in projected lost U.S. GDP over the next decade if the U.S. does not deliver the connectivity needed for the moment. This is not a distant risk. Decisions made right now will determine whether advanced wireless networks and 6G arrive on time and at scale. Our networks will either keep pace with AI, or become a key factor potentially holding back U.S. AI leadership.

FUTURE GLOBAL 6G BANDS



$200B

BOON FOR U.S. ECONOMY

with global harmonization

Spectrum Is the Missing Piece of AI Infrastructure

Every generation of wireless has required more spectrum, and 6G will demand more still. Larger, contiguous blocks will unlock new functionalities, smarter networks, faster speeds, and lower latency. The good news is that opportunities are emerging for U.S. leadership thanks to this Administration's and Congress' ambitious work to deliver 800 megahertz of new licensed spectrum. The FCC's 2027 upper C-Band auction will create a more than 400-megahertz block of contiguous mid-band spectrum. The Administration's progress on 2.7 GHz will also help address near-term demand. But the coming wave of AI-driven traffic will require even more. Two bands stand out for future licensed use: the 4 GHz band, which could deliver hundreds of contiguous megahertz of new mid-band capacity to seed 6G, and the 6/7 GHz range, starting with the 275 megahertz earmarked in the President's 6G memorandum, which offers similarly large contiguous blocks well-suited for next-generation wireless. The key now is clearly defining our future domestic access and quickly exporting that plan to our allies in advance of the global World Radiocommunication Conference next year. A clearly defined 6G roadmap—leveraging these specific bands as the connectivity layer that will support the next decade of AI-driven innovation—would jumpstart global harmonization, help counter China, and alone add $200 billion to our economy.

Building Our AI and Wireless Futures

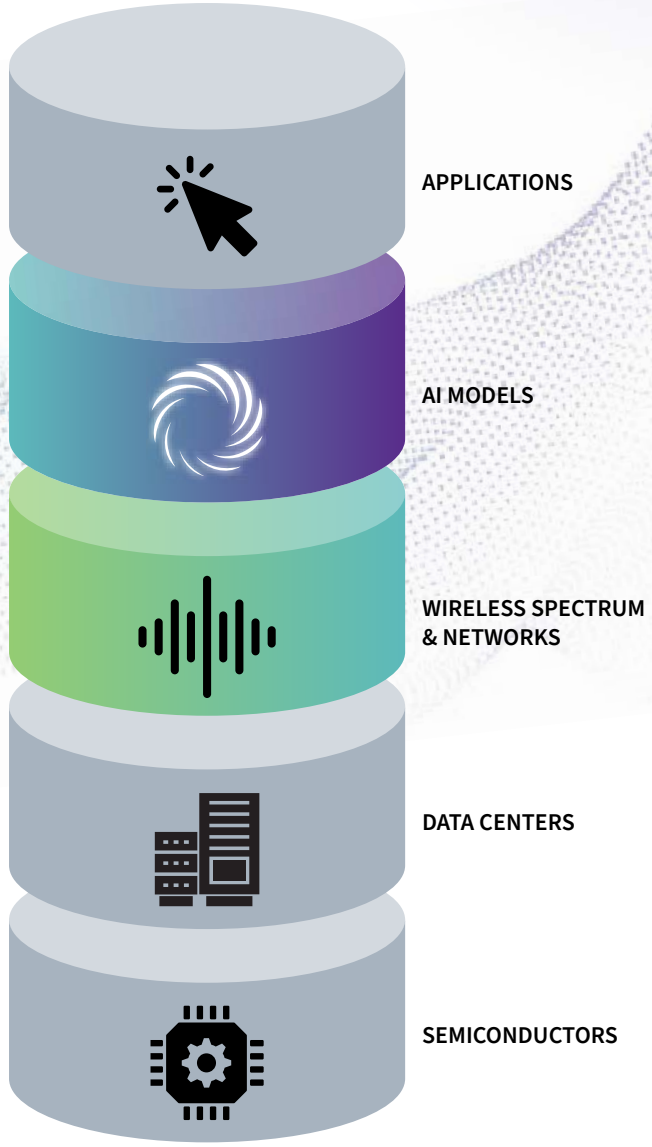
Spectrum alone is not enough. You still need the towers, small cells, fiber backhaul, data centers, and edge compute to actually deliver the promise of AI. That infrastructure requires hundreds of billions of dollars in new investment across these technologies. Today, the two largest infrastructure investors in the United States are wireless companies and AI companies. They are already hard at work building tomorrow's digital infrastructure. The question is whether public policy keeps pace and helps accelerate it. That means siting and permitting rules that do not slow deployment to a crawl. Tax policy that accelerates investment rather than discourages it. And consistent national rules—not a patchwork of state-by-state regulations that add cost and uncertainty.

> "If we do not catch up and lead [in 6G], it will be Huawei that creates the backbone … handicapping our efforts in other adjacent technologies like AI, quantum, and semiconductors … "
>
> **—SENATOR TED CRUZ R-TX**
> CHAIRMAN OF THE SENATE COMMERCE COMMITTEE

An Economic and National Security Imperative

Getting AI, spectrum policy, infrastructure investment, and 6G right isn't just a technology decision. It's an economic and national security imperative. The prize is leadership in the integrated system of semiconductors, data centers, models, applications, and networks that will power future innovation. The AI stack and whoever builds it will set the rules for the emerging AI-driven economy. The United States and our allies have the chips, the cloud, and the models—but China is moving fast, investing across every layer with a clear intention to offer the world its own version. We need to match their ambition to ensure that our allies build their AI ecosystems on a trusted, open, and American-led foundation, all connected by harmonized spectrum bands. That is why we must integrate our AI strategy and our national spectrum initiative into a single, cohesive framework.

THE AI/6G STACK

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