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The Growing Importance of Telecommunications in AI

by

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1. Introduction and Summary

Ever since the introduction of ChatGPT in November 2022, both the supply and demand for artificial intelligence (AI) have increased geometrically. Although there is significant disagreement over many aspects of AI, including its effect on jobs, economic growth, and the broader society, few people doubt that it will have a profound effect on our lives. And few should doubt that maintaining high-capacity, robust, reliable, and secure telecommunications networks will be essential to maintaining America's AI leadership.

Commentators have spent a great deal of energy trying to predict AI's impact on specific economic sectors, including, for example, health care, education, material sciences, and financial management. However, less attention has been given to the other direction of causation – the critical role of America's infrastructure networks, especially telecommunications networks, in maintaining high-performing AI services. Telecommunications networks increasingly are foundational elements undergirding virtually all economic activity. In order for AI services to perform efficiently and effectively, other extensive infrastructure networks, including those for electricity, water, and transportation, must also increase their reliance on telecommunications providers' continuous and secure transmission of increasing amounts of data. Therefore, it is

incumbent upon policymakers to ensure that America's telecom networks are robust and resilient enough to support these sectors.

A healthy AI sector requires the transmission of incredible amounts of data with low latency in order to train the models. It also demands enormous amounts of electricity, which needs to be transmitted from where power is generated to the massive data farms that house the computer models. The power grid also provides the vast amounts of computing power needed to analyze data. AI systems also need access to a significant amount of water to cool the computers. Finally, smart transportation networks offer many potential benefits like autonomous vehicles, predictive maintenance, and automatic tolling. But like electricity and water, smart transportation networks depend on the constant flow of accurate, secure information on a real-time basis.

Policymakers should be cognizant of this interdependence. Like the computer chips that analyze data, telecommunications networks generate great value to AI platforms. Regardless of their effect on the broader economy and society, AI services will continue to be dependent on the availability of ample computing power, electricity, and water – again, each of which, in turn, requires telecommunications networks to deliver a constant flow of data.

The relationship between telecommunications and AI is therefore two-sided. AI is dependent on robust and secure telecommunications networks, and, in the other direction, use of AI services will lead to significant increases in value and efficiency for the telecom sector. To ensure that telecommunications networks are able to provide all the elements of the AI ecosystem with the capacity needed for growth, along with the sophisticated ancillary services that are part and parcel of advanced communications networks, policymakers must ensure that light-handed regulatory policies are in place that spur continued broadband investment and applications and services innovation.

2. How the Telecommunications Sector Affects AI

Telecom networks are the physical and digital foundation on which AI services run. They provide fiber connectivity, edge computing, power infrastructure, and data transmission capacity. In return, AI services help telecoms modernize their own networks, creating a symbiotic relationship.

Although telecom companies have long provided the infrastructure underlying communications, they are now poised to take on a new role: continuing to build out the infrastructure that allows enterprises, governments, and consumers to unlock AI's full potential.[1] Telecom networks' vast footprint enables them to meet the rising need for high-performance compute and connectivity required by AI. Telecom networks support a web of other critical infrastructure systems like energy and water availability, that are also critical to the AI ecosystem.

Telecommunications networks, especially broadband, mobile networks and backbone fiber, are a prerequisite for AI deployment at scale. AI does not function independently; it relies on data

[1] Abhyuadaya Shrivastava, et al., "AI Infrastructure: A New Growth Avenue for Telco Operators," McKinsey, February 28, 2025, https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-infrastructure-a-new-growth-avenue-for-telco-operators.

storage and real-time communication between devices, cloud platforms, and edge compute nodes. Policy that ensures open, affordable, high-capacity communication networks expands the base of AI innovation by enabling faster data flows, reduced latency for real-time models, and broader access to computational services. Without access to advanced communications, AI innovation likely becomes concentrated in markets with isolated infrastructure, thereby reducing competition and overall economic growth.

3. AI Will Strengthen the Value of Telecommunications

In response to efforts that strengthen the telecommunications networks on which AI depends, AI will in turn produce improvements in the performance of the telecommunications networks themselves. Bain recently released a summary of the many ways in which AI is already challenging the telecommunications industry.[2] AI will transform telecommunications networks to become more intelligent, adaptive, and operationally efficient, thereby measurably improving economic outcomes. AI-enabled network automation could save billions of dollars by eliminating operational inefficiencies and enhancing service quality. Policies that support experimentation, integration, and deployment of AI within telecom sectors will unlock large amounts of economic value.

AI is reshaping networks into intelligent systems that anticipate needs, self-heal, and deliver new value. The integration of AI has become central to staying competitive in markets where customer expectations and data demands rise daily. An Ericsson blog stated that: "Artificial Intelligence (AI) is a transformative technology that will drive innovative use cases, service enhancements, and operational efficiencies in mobile telecommunication networks. AI in mobile networks will enable intent-driven autonomous networks, facilitate advanced network optimization, provide dynamic resource allocation and predictive maintenance, and deliver differentiated connectivity."[3]

4. Extending Telecom Networks: Power, Water, and Transport

In addition to telecommunications, AI is also dependent on other sectors of national infrastructure that, in turn, depend on telecom. In a recent study the International Energy Agency reported that global data centers consumed about 415 TW of electricity in 2024 and predicted that demand would rise to 945 TW by 2030.[4] Looking ahead, the co-development of power grids and AI data centers will be essential to maintaining the pace of AI innovation in a reliable and sustainable manner.[5] Hundreds of planned data centers are slated to use at least 300 MW each,

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[2] Bain & Company, "AI in Telecommunications," https://www.bain.com/insights/ai-in-telecommunications/?utm_source=chatgpt.com. See also, "Francesco Venturini and Bart Valkhof, "How Telecoms Can Thrive in the Age of Generative AI," World Economic Forum, February 27, 2025, https://www.weforum.org/stories/2025/02/how-telecoms-can-thrive-in-age-of-generative-ai/.

[3] Scott Poretsky, "Securing AI in Mobile Networks: 10 Key Considerations for Telcos," Ericsson, February 24, 2026, https://www.ericsson.com/en/blog/2026/2/securing-ai-in-mobile-networks-10-key-considerations-for-telcos.

[4] International Energy Agency, "Energy and AI," Technical Report, April 10, 2025, https://iea.blob.core.windows.net/assets/de9dea13-b07d-42c5-a398-d1b3ae17d866/EnergyandAI.pdf.

[5] Xin Chen et al. "Electricity Demand and Grid Impacts of AI Data Centers: Challenges and Prospects," November 26, 2025, https://arxiv.org/pdf/2509.07218.

with many over 1 GW.[6] These are expected to be completed within the next two to three years, giving the power industry little time to respond.

The large-scale integration of data center loads into the existing power network requires significant improvement on many fronts. These include long-term planning for supply and demand, the construction and interconnection of power stations, the delivery of adequate supply in the short-term, and enhanced security and stability. Solutions will depend on collaboration between grid operators, data centers, and end-users, and will include advances in AI load forecasting and dynamics modeling, standardization and regulation, energy efficient hardware, and energy-conscious AI usage. The co-development of power grids and AI data centers will be essential to maintaining the rapid pace of AI innovation in a reliable and sustainable manner.[7]

Data centers also require constant access to water for cooling systems, generating electricity, and operational backup. As a result, they are deeply embedded within regional hydrological systems. At peak operation large data centers may use up to five million gallons of water per day. Because of this high demand, a shift is occurring toward integrating digital infrastructure into long-term water resource planning rather than treating it as an isolated industry.[8]

Although attention is often centered on data centers, most water use, including that needed for data centers, occurs at electric plants and is almost three times as large. Indirect water consumption linked to power generation is expected to nearly double, going from 54 billion gallons in 2025 to 91 billion gallons by 2030. The figures for direct use at data centers are 22 billion and 34 billion, respectively.[9]

Virtually all aspects of transportation – from the design, construction, operation, and maintenance of physical infrastructure to the digital systems that underpin the movement of people and goods – will likely be impacted by AI. Some uses merit special attention. AI systems can help determine long-term planning solutions for new infrastructure, adjust traffic signals to manage congestion, monitor bridge and road conditions, and dispatch emergency services in the case of crashes.

In a recent request for information the Department of Transportation stated that virtually all aspects of transportation including the design, construction, operation, and maintenance of physical infrastructure systems as well as the operation of the digital infrastructure that underpins

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[6] Mark P. Mills, "The Rise of AI: A Reality Check on Energy and Economic Impacts," National Center for Energy Analytics, November 13, 2025, https://energyanalytics.org/the-rise-of-ai-a-reality-check-on-energy-and-economic-impacts/.

[7] Xin Chen et al. "Electricity Demand and Grid Impacts of AI Data Centers: Challenges and Prospects," November 26, 2025, https://arxiv.org/pdf/2509.07218.

[8] Melek Öztürk, "Water Implications of AI-Driven Digital Infrastructure Expansion, TRENDS Research and Advisory, February 8, 2026, https://trendsresearch.org/insight/water-implications-of-ai-driven-digital-infrastructure-expansion/.

[9] Smart Water Magazine, "AI's Electricity Boom is Redrawing the U.S. Water Map," February 23, 2026, https://smartwatermagazine.com/news/bluefield-research/ais-electricity-boom-redrawing-us-water-map.

and enables the movement of people and goods will likely be impacted by the deployment of AI tools.[10]

AI will also help the transition to autonomous vehicles through a combination of sensors, cameras, and networks that interpret traffic movements.[11] Optimization of traffic routes can save money, reduce emissions, and speed delivery. The use of digital twins allows planners to test traffic interventions and predict vehicle maintenance.

5. The Opportunity for Telecommunications Companies

In order to thrive in the future, telecom companies must continue to evolve. By way of example, a McKinsey study describes four possible business models that telecom firms could adopt.[12] The first is to help connect data centers with fiber, for which McKinsey estimates a market of $30 to $50 billion. Second, companies could use intelligent network services to focus on enabling high-performance access to the cloud (measured at $70 to $80 billion). Third, companies could concentrate on turning unused space and power into revenue for hyperscalers, GPU as a Service (GPUaaS), and large enterprises needing immediate access to data center space and power. Finally, companies could concentrate on building a new business focused on GPUaaS, a market valued at $35 to $70 billion. Each of these models is capable of delivering large benefits to telecoms. Whichever business models telecommunications firms pursue, AI will require significant transformation from them. This transformation, in turn, will contribute to the strength of the AI ecosystem.

A recent McKinsey report states that telecoms have not captured a fair share of the growth from previous tech disruptions that substantially increase data traffic. In contrast:

> Building and operating [AI] infrastructure require assets that many telcos already have: extensive fiber networks, national footprints, space and presence at the edge, access to power, and experience managing complex, high-availability networks. The question is no longer whether telcos are relevant to AI infrastructure, but where along the value chain they can compete effectively and profitably.[13]

However, in order to take advantage of these opportunities, telecommunications companies will have to manage numerous risks, including unknown demand, competition from hyperscalers, rapid technology shifts, and potential price drops from increased supply.

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[10] Department of Transportation, "Opportunities and Challenges of Artificial Intelligence (AI) in Transportation," Request for Information, 89 *Federal Register*, 36848, May 3, 2024, https://www.federalregister.gov/documents/2024/05/03/2024-09645/opportunities-and-challenges-of-artificial-intelligence-ai-in-transportation-request-for-information.

[11] Ron Belenky, "The Future of AI in Transportation: How Movement, Logistics, and Operations are Changing," Aiola, July 31, 2024, https://aiola.ai/blog/future-of-ai-in-transportation/.

[12] Abhyuadaya Shrivastava, et al., "AI Infrastructure: A New Growth Avenue for Telco Operators," McKinsey, February 28, 2025, https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/ai-infrastructure-a-new-growth-avenue-for-telco-operators.

[13] Gustav Grundin, et al., "Issue Brief: AI Infrastructure," McKinsey, February 27, 2006, https://www.mckinsey.com/industries/technology-media-and-telecommunications/our-insights/issue-brief-ai-infrastructure.

6. The Need for a Proper Regulatory Framework

For telecommunications networks to be able to provide the robust, resilient, and secure high-capacity transmission facilities needed to support the AI infrastructure, government policies must create an environment conducive to continued substantial investment in the deployment of advanced wireless and wireline broadband networks and continued innovation. For the FCC, this means a continuation of the light-handed regulatory framework that the current FCC leadership embraces. It means no return to the heavy-handed "Net Neutrality" regime embraced by the Biden administration. Congress, of course, has a role to play in ensuring that regulatory policies conducive to continued investment and innovation in broadband networks are maintained.

The private sector already invested over $2.2 trillion since 1996 building out broadband networks.[14] Much more will be needed to install and maintain the advanced telecommunications infrastructures of the future. That's why policies that don't create disincentives for investment and innovation are so important. One issue that is already cropping up in the context of broadband is reducing permitting delays by federal, state and local governments.[15] Broadband deployment often requires providers to obtain the consent of government agencies to use public property and rights of way. This process, which should only take a few months, often stretches out for many more. Common complaints are a lack of staff, inattention, excessive fees, and additions to the work required. These in turn delay projects and add to their cost, making providers less likely to pursue them.

The government may need to set AI-specific rules concerning mandatory incident reporting, model auditing, and resilience against attack. Any new rules should only be imposed after clear identification of a market failure and rigorous cost/benefit studies. At bottom, it's important for Congress, the FCC, and other agencies to continue the largely free market policies that have enabled the vibrant, ubiquitous Internet Americans enjoy today and not revert to the heavy-handed form of utility regulation used in Europe. There is no evidence that the private sector cannot adapt to the changes that may be required to support AI if markets are kept free from unnecessary government intervention.

Whereas in the past telecommunications networks were viewed largely as "pipes" to transmit content, now more than ever before, they must be active participants in ensuring national security, economic competitiveness, and the economy's digital transformation. One study characterizes this increased role as one of the most consequential regulatory shifts of our era, resulting in a fundamental change in how regulators see telecoms.[16] Given the interaction of AI, telecommunications, and other critical infrastructure, regulators will need to build a comprehensive framework that can foster innovation while still ensuring the security and resilience of critical infrastructure. Coordination between telecoms and other critical

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[14] USTelecom, "2024 Broadband Capex Report," October 21, 2025, https://ustelecom.org/research/2024-broadband-capex-report/.

[15] Joseph V. Kennedy, "Measuring the Value of Broadband Development: Why the FCC's Focus on Permit Reform Matters," Free State Foundation, *Perspectives from FSF Scholars*, February 9, 2026, Vol.21 No.7, https://freestatefoundation.org/wp-content/uploads/2026/02/Permitting-Delays-Perspectives.Final_.021026.pdf.

[16] Paul Waite, "Telecom Regulation 2026: What Industry Leaders Need to Know," Wray Castle, January 14, 2026, https://wraycastle.com/blogs/knowledge-base/telecom-regulation-2026-what-industry-leaders-need-to-know.

infrastructure providers like energy, transport, and water, is indispensable for building the network needed for AI to realize its full potential.[17]

7. Conclusion

This *Perspectives* makes three main points. First, AI's value depends upon its access to sophisticated and robust telecommunications networks that are capable of sending massive amounts of data with very low latency and providing additional services such as GPUaaS. Second, this dependence represents both a challenge and an opportunity for telecoms to add value to the growing number of industries that increasingly depend on networks of data, including networks devoted to AI, power, water, and transportation. Finally, AI is likely to make significant contributions to the productivity and profitability of those companies that take advantage of it, including those building out data networks.

AI promises a revolution in both the economy and the broader society. But AI also depends on the nation's infrastructure, especially its telecommunications networks. If AI cannot obtain the vast amounts of power and water it needs, if it cannot connect with users to gather data and deliver value, or if access to this infrastructure is compromised, AI collapses. The government needs to address these threats by creating regulatory environments that encourage continued investment and innovation in information networks by private parties. Failure to update and secure the telecommunications networks on an ongoing basis will threaten AI's transformative power. On the other hand, building and operating the next generation of telecommunications services offers new opportunities for the industry. In particular, it ensures that more of the networks' value switches to data delivery and analysis, raising the possibility that telecoms capture a larger slice of their networks' value added.

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[17] Sigve Brekke, "Why Telecommunications is a Lynchpin Between Cybersecurity and AI for Good," World Economic Forum, January 15, 2024, https://www.weforum.org/stories/2024/01/telecommunications-important-balancing-connectivity-cybersecurity-ai/.