

America's Artificial Intelligence Build-out, Measured Against the Railroad Age — July 13, 2026

Artificial Intelligence ("AI") Data Centers. Across the United States, technology companies are building data centers — warehouse-sized buildings filled with specialized computer chips, servers, cooling systems, and network equipment, plus the electrical infrastructure needed to power them. These facilities do two things: they "train" AI systems by processing enormous amounts of information, and they answer the millions of questions users send to those systems each day. The buildings cluster where electricity and fiber-optic lines are plentiful — such as northern Virginia, Texas, Ohio, and Georgia — rather than near the companies' headquarters. As a result, many Americans never see an AI data center.

Today's Costs. Four companies lead the spending: Alphabet (Google), Amazon, Meta (Facebook), and Microsoft. Their combined capital spending rose from about \$93 billion in 2020 (0.4% of that year's U.S. gross domestic product, or GDP) to about \$410 billion in 2025 (1.3% of GDP),¹ and the companies have announced plans totaling roughly \$700 billion for 2026 — more than 2% of the U.S. economy's current annual output. These figures are an indicator, not an exact count: they represent the four companies' total worldwide capital spending, so they include some non-AI investment while leaving out other builders, such as Oracle, CoreWeave, xAI, and the power plants rising alongside the data centers.

Railroad Comparison. From 1870 to 1890, U.S. railroad infrastructure (track, bridges, tunnels, depots, and trains) experienced its peak expansion: over 110,000 net additional route-miles were added — over four times the earth's circumference! Grain, coal, steel, and lumber could now be moved at lower costs between any two regions of the country. Railroad capital spending averaged about 2.4% of GDP across the 1870s and 1880s, exceeded 3% of GDP in five separate years, and peaked at 5.4% in 1871 — *more than double the percentage of GDP implied by the four technology companies' plans for 2026.*² These figures, too, have limits: they are after-the-fact reconstructions, built by economic researchers in the 1950s from samples of old state railroad records and measured against GDP estimates for an era before official GDP statistics existed.

Perspectives. Today's planned U.S. AI infrastructure build-out is massive — more than 2% of GDP for 2026. Yet, it has not reached the railroads' 19th-century proportions, and neither of those private build-outs compares to the U.S. government's total annual wartime spending, which topped 40% of GDP in 1943, 1944, and 1945. Each railroad investment wave ended in a financial crisis — in 1873, 1884, and 1893. The railroads were built almost entirely with outside money, largely from European investors. The four leading technology companies have funded data centers mostly from profits, though several began borrowing heavily in 2025. Newer builders are unprofitable, relying almost entirely on outside money.

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This commentary was developed with research and drafting support from Claude, an artificial intelligence assistant created by Anthropic, PBC.

¹ Alphabet Inc., Amazon.com, Inc., Meta Platforms, Inc., and Microsoft Corporation, Forms 10-K (2020–2025), U.S. Securities and Exchange Commission, <https://www.sec.gov/edgar> (accessed July 12, 2026);

U.S. Bureau of Economic Analysis, "Gross Domestic Product," <https://www.bea.gov/data/gdp/gross-domestic-product> (accessed July 12, 2026).

² Melville J. Ulmer, *Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing* (Princeton: Princeton University Press for the National Bureau of Economic Research, 1960), Table C-1, <https://www.nber.org/chapters/c1498> (accessed July 12, 2026); Louis Johnston and Samuel H. Williamson, "What Was the U.S. GDP Then?" MeasuringWorth, <https://www.measuringworth.com/datasets/usgdp/> (accessed July 12, 2026).