Trump Administration Science & Technology Highlights:

Year One

Office of Science and Technology Policy
The White House

January 2026

"We are going to conquer the vast frontiers of science, and we are going to lead humanity into space and plant the American flag on the planet Mars and even far beyond. And, through it all, we are going to rediscover the unstoppable power of the American spirit, and we are going to renew the unlimited promise of the American dream."

Donald J. Trump
45th and 47th President of the United States

Table of Contents

Foreword

Since beginning his second term in January 2025, President Trump has taken decisive action to support and advance scientific progress and technological innovation for the American people. Recognizing the importance of science and technology to our economic prosperity, national security, and the American way of life, President Trump has tasked the White House Office of Science and Technology Policy with securing America's unrivaled world leadership in critical and emerging technologies. Over the last 12 months, the Trump Administration has been hard at work implementing pro-innovation policies across the Federal Government in support of the American builders, innovators, and entrepreneurs who seek to pioneer a bright new future for all mankind.

In his first term, President Trump recognized that emerging technologies—including artificial intelligence, quantum information science, nuclear technologies, space exploration, telecommunications, biotechnology, advanced transportation, and advanced manufacturing—were critical to American competitiveness, and would become the "Industries of the Future." Now, in his second term, those industries of tomorrow have become the industries of today. The Trump Administration is focused on ensuring that the United States leads in all of them, by aligning policy, regulatory frameworks, and funding authorities to accelerate mission-driven research and development, strengthen domestic supply chains, spur robust private-sector investment, and champion American companies in global markets.

Over the past year, President Trump has signed executive orders to reorient Federal policy on AI, nuclear energy, commercial supersonic flight, drones, space exploration, and 6G. The launch of America's AI Action Plan has provided a north star for the nation as the administration advances AI innovation, infrastructure, and international partnerships. The Genesis Mission is the most ambitious scientific undertaking since the Apollo program, ushering in a new era of public-private partnerships as it seeks to double research and development productivity by the end of the decade. The Federal Government has directed $200 billion of funding for gold standard science research in the physical and life sciences that underpin critical technologies. Departments and agencies are taking down barriers to innovation, establishing testbeds, and employing regulatory waivers to further technology commercialization. Trillions of dollars in private sector investments will revitalize our domestic technology manufacturing base and supply chains, reindustrializing the nation. The American AI Exports Program is bringing together diplomatic and development resources to support the American technology stack all over the world. Technology Prosperity Deals with key international allies, and the Pax Silica initiative, are creating a new global coalition of nations that recognize the importance of critical technologies for the prosperity of their peoples.

This document highlights wins throughout the national science and technology ecosystem during the first year of the second Trump Administration. The actions taken by the Administration these last 12 months have laid an incredible foundation for the years ahead. Building upon it, we will ensure America's science and technology engine remains the greatest in the world as we usher in a new Golden Age of American Innovation.

Michael J. Kratsios
Assistant to the President for Science and Technology
Director of the Office of Science and Technology Policy

Artificial Intelligence

"America is the country that started the AI race. And as President of the United States, I'm here today to declare that America is going to win it."

– President Donald J. Trump, July 23, 2025

America is in a race to achieve global dominance in AI—and the nation that wins will shape the industries, set the standards, and secure the strategic advantages of the 21st century. AI will transform every sector of the American economy: accelerating drug discovery and improving health outcomes, driving advanced manufacturing, strengthening our defense capabilities, and making American businesses more productive. As global competitors move to aggressively exploit these technologies, it is imperative that the United States maintains unquestioned technological leadership to ensure that these benefits accrue to the American people.

In 2025, the Trump Administration took historic steps to advance U.S. dominance in AI. In his first week back in office, President Trump rescinded the disastrous Biden AI Executive Order which hindered AI innovation and endangered technological leadership at a critical time. In July 2025, President Trump signed America's AI Action Plan, which identified over 90 Federal policy actions to promote American AI by enabling adoption, removing red tape, and investing in R&D, while securing American technologies and protecting them from malicious use. On the same day, President Trump issued three AI Executive Orders to export American AI, promote rapid buildout of data centers and supporting energy infrastructure, and uphold free speech in AI models. In addition, the Trump Administration launched the Genesis Mission that applies AI to our scientific enterprise, created a national strategy for AI diplomacy, prioritize AI across R&D budget priorities, and established a whole-of-government effort to advance regulatory reforms that enable sector-specific AI adoption.

Throughout, President Trump has made clear that American workers must be at the center of our AI strategy—ensuring that the ongoing AI boom translates into jobs, upskilling, and opportunity for the American people. He also launched initiatives to apply AI in K-12 education, created the Presidential AI Challenge, signed an Executive Order to use AI to tackle childhood pediatric cancer, and signed into law the TAKE IT DOWN Act to protect our children and families.

President Trump's work on AI builds on extensive actions from his first term. The President's foresight about the importance of American AI leadership led him to sign the first-ever Executive Order on AI in 2019. This Order launched the Nation's first AI Strategy, the American AI Initiative—which contains pillars still relevant today, including removing barriers to AI innovation, preparing the U.S. workforce with skills to adapt an thrive in the age of AI, and promoting an international environment that opens markets for American industry. The First Trump Administration also committed to doubling AI research investment, established the first-ever national AI research institutes, strengthened American leadership in AI technical standards, and issued the first-ever U.S. regulatory guidance to provide clarity and enable AI adoption in the private sector, paving way for the unprecedented AI boom we see today.

Highlights

AI Innovation

Unveiling America's AI Action Plan. On July 23, 2025, the White House released "Winning the AI Race: America's AI Action Plan," which synthesized a whole-of-government strategy to win the AI race and power a new age of American leadership in science, technology, and global influence. The Plan identifies over 90 Federal policy actions across three pillars: accelerating AI innovation, building domestic AI infrastructure, and leading in international diplomacy and security. Since its release, Federal agencies have been implementing priority actions, including launching the American AI Exports Program, identifying Federal lands and streamlining permitting for AI infrastructure buildout, ensuring AI models procured by the government prioritize truthfulness and ideological neutrality, and investing in a skilled AI workforce.

Removing Barriers to American AI Innovation. In his first week in office, President Trump signed Executive Order 14179, "Removing Barriers to American Leadership in Artificial Intelligence," which revoked the Biden Administration's harmful AI Executive Order that established unnecessarily burdensome requirements for companies developing and deploying AI. The President's new Executive Order refocused U.S. AI policy on promoting economic competitiveness and national security, and emphasized that American development of AI systems must be free from ideological bias or engineered social agendas. It also directed the development of America's AI Action Plan, a whole-of-government strategy to solidify America's AI dominance.

Enabling Sector-Specific AI Adoption. Pursuant to the AI Action Plan, on September 26, 2025, the White House released a Request for Information, "Regulatory Reform on Artificial Intelligence," to identify existing Federal regulatory frameworks that unnecessarily hinder the development, deployment, and adoption of AI. The Administration is coordinating regulatory reform efforts across Federal agencies through OMB's Fall 2025 Regulatory Agenda to promote AI innovation and adoption.

Preventing a Patchwork of AI Regulations. On December 11, 2025, President Trump signed Executive Order 14365, "Ensuring a National Policy Framework for Artificial Intelligence," which will protect American AI innovation from an inconsistent and costly compliance regime of 50 different state laws. Instead, the EO calls for a common-sense, unified Federal approach to AI policy that removes unnecessary red tape, updates out-of-date rules created before AI advancements, and clarifies new rules for certain sectors or use-cases, such as protecting children's wellbeing online. A single national framework will decrease barriers to entry in AI and promote innovation, while ensuring American companies can compete on the world stage and are not subject to restrictions that their international competitors do not face.

Training Small Businesses to Leverage AI. Through Small Business Development Centers (SBDCs), the Small Business Administration is on track to have trained 100,000 small businesses in AI over three years. In partnership with the private sector, the SBDC network is helping entrepreneurs start and grow small businesses by hosting trainings, webinars, and one-on-one counseling on AI solutions for businesses.

"The Genesis Mission connects world-class scientific data with the most advanced American AI to unlock breakthroughs in medicine, energy, materials science, and beyond."

– Director Michael Kratsios, November 24, 2025

AI R&D and AI for Science

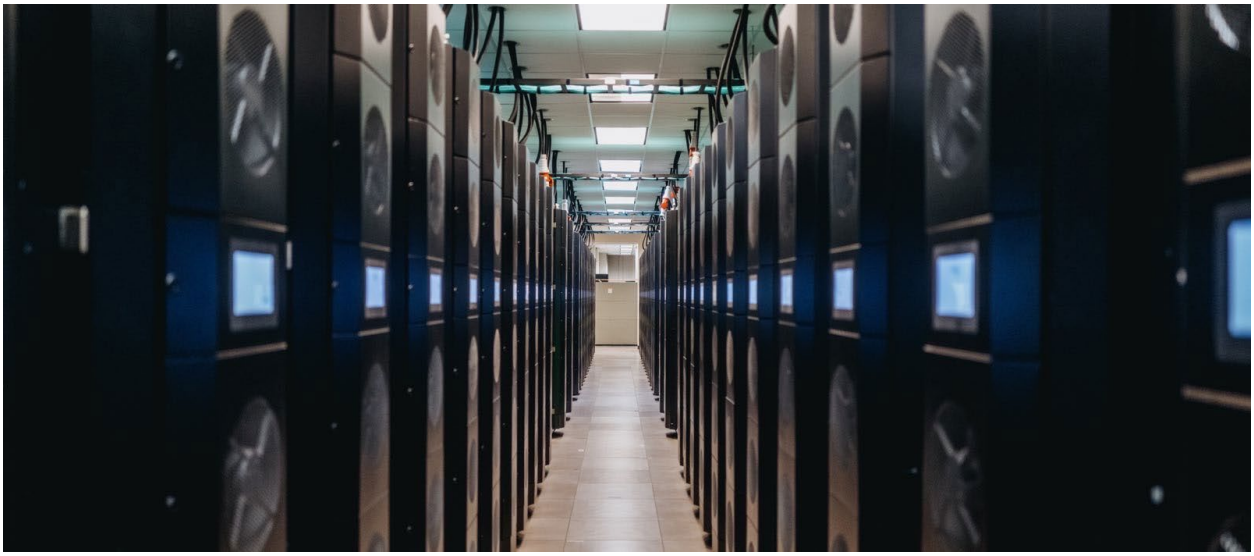
Launching the Genesis Mission to Leverage AI for Science. On November 24, 2025, President Trump signed Executive Order 14363, "Launching the Genesis Mission," a new national effort to use AI to transform how scientific research is conducted and accelerate the speed of discovery, with the aim of doubling the productivity and impact of federally-funded scientific research and development within a decade. The Mission mobilizes the Department of Energy's 17 National Laboratories, private industry, and America's leading universities and harnesses the world's best supercomputers, experimental facilities, AI systems, and unique datasets across every major scientific domain to tackle use-inspired science and technology challenges, strengthen national security, and secure energy dominance. On December 10, 2025, DOE announced over $320 million in investments across four signature initiatives to advance the Mission's AI capabilities. The American Science Cloud, which was introduced in

President Trump signing executive orders at the launch of America's AI Action Plan. (July 23, 2025)

President Trump's One Big Beautiful Bill and appropriated $150 million, will serve as a central platform to host and distribute AI models and scientific data to the broader research ecosystem. The other initiatives include the Transformational AI Models Consortium for building and deploying self-improving AI models for scientific applications; 14 projects in robotic automated laboratories and the autonomous control of large-scale experiments; and 37 foundational AI awards to curate existing data and develop refined AI models. On December 18, 2025, DOE announced research collaboration agreements with 24 industry participants to advance the Genesis Mission.

Prioritizing AI R&D Funding. The Trump Administration has prioritized AI R&D across budget requests and guidance to Federal research agencies. President Trump's Fiscal Year 2026 Discretionary Funding Request maintains funding for research in AI and quantum information science at key agencies, to ensure the United States remains on the cutting edge of the development and adoption of these technologies. On September 23, 2025, OSTP released M-25-34/NSTM-2, "Fiscal Year 2027 Administration Research and Development Budget Priorities and Cross-Cutting Actions," which prioritizes the R&D required to ensure and extend American leadership in key technologies, including AI. NSTM-2 calls on agencies with AI-related R&D to direct investments toward fundamental research into novel AI paradigms and computing architecture and the application of AI to accelerating scientific discovery.

Building AI Supercomputers. The Trump Administration has secured unprecedented industry commitments to advance AI supercomputer projects at the DOE National Laboratories, which will deliver world-class AI capabilities for DOE researchers, dramatically decrease the time it takes researchers to move from idea to discovery, and drive progress in fields ranging from healthcare research to materials. DOE operates the three fastest exascale supercomputers in the world, *El Capitan* at Lawrence Livermore National Laboratory (LLNL), *Frontier* at Oak Ridge National Laboratory (ORNL), and *Aurora* at Argonne National Laboratory (ANL). On October 28, 2025, DOE announced landmark public-private partnerships to build two next-generation AI supercomputing systems at ANL, including *Solstice*, which will be the largest AI supercomputer in the DOE lab's complex. Additional world-class AI



The National Science Foundation Leadership-Class Computing Facility at the Texas Advanced Computing Center (TACC).

supercomputers announced in 2025 include Berkeley Laboratory's *NERSC-10* (a.k.a. *Dounda*), which will provide almost ten times the performance of the center's current flagship computer, the National Nuclear Security Administration (NNSA) Los Alamos National Laboratory's *Mission* and *Vision*, and ORNL's *Discovery* and *Lux*. Enabled by the Trump Administration's commonsense approach to computing partnerships, featuring unprecedented private investments and a competitive procurement process, new AI supercomputer deployments are set to start in early 2026 and tackle the nation's most complex scientific challenges.

Advancing the Open-Source AI Ecosystem. On August 14, 2025, the National Science Foundation (NSF) announced a public-private investment that provides $152 million, over half of which comes from industry, to create a fully open suite of advanced AI models specifically designed to support the U.S. scientific community. The initiative, which involves sharing not just model weights but training data and other artifacts, will enable America's researchers to accelerate breakthroughs across materials science, biology, energy, and more. These investments, combined with support from the NSF's National AI Research Resource Pilot and the DOE-maintained Oak Ridge Leadership Computing have has since produced a series of high-performance, fully-open source AI models including *Olmo 3*. A robust ecosystem of domestic open-source AI models provides American innovators and small businesses secure, trusted AI systems for sector-specific use cases, removing the need to retrain their own models from scratch.

Hardening Open-Source Ecosystems. On September 29, 2025, NSF announced the first-ever Safety, Security, and Privacy of Open-Source Ecosystems investment in eight teams, each of which received up to $1.5 million to address vulnerabilities in open-source projects and their deployment infrastructure, including for open-source AI applications. Participants, including five U.S. research universities, will address a broad range of challenges from code vulnerabilities and side-channel attacks to supply chain and insider threats. As open-source AI software continues to be used for hospital medical records, cloud computing, national security applications, and other critical systems, the Trump Administration's investment protects Americans' privacy and expands the adoption of open-source AI applications.

Expanding Access to AI-Ready Scientific Datasets. In response to the AI Action Plan and the Evidence Act signed during President Trump's first term, DOE and NSF advanced major efforts to expand access to AI-ready scientific datasets. In September 2025, DOE updated its 2025 Open Data Plan, which commits to publishing DOE's extensive data assets, including over 3,700 on Data.gov, in machine-readable formats with appropriate metadata. This will empower data-driven decisions across the DOE's vital energy, science, and security missions and make data assets more accessible for the wider AI research community. The Plan is reinforced by the DOE's FY25-28 Enterprise Data Strategy, released in July 2025, which sets department-wide goals to coordinate data governance, modernize data infrastructure, and promote the use of DOE data to develop and apply AI tools for scientific discovery. On August 28, 2025, NSF launched the Integrated Data Systems and Services program, which will build out national-scale data systems that allow researchers across the country to access, use, and share scientific data to accelerate AI innovation and reproducible scientific discovery. On the same day, NSF selected ten datasets for integration into the National AI Research Resource (NAIRR) pilot. The datasets cover a range of domains, including lidar-based terrain mapping,

microbiome data, and software supply chain graphs, which will train innovative AI models targeted at specific national challenges.

Scaling Up the National AI Research Resource. On September 2, 2025, as directed by the AI Action Plan, NSF released a solicitation for the NAIRR Operations Center to manage and expand the NAIRR Pilot. The NAIRR Pilot, a joint effort by 15 Federal agencies and 28 private sector partners, provides U.S. researchers and educators sustained access to AI resources, including models, compute, data, software, training, and educational materials, to accelerate AI-driven discovery and innovation. The Operations Center will facilitate the transition from the pilot into a scalable long-term program that will advance frontier AI research and accelerate AI workforce training across the nationwide research community. To date, the NAIRR Pilot has supported over 620 research projects across all 50 states, including AI applications to predict Alzheimer's, forecast extreme weather, and discover new proteins.

Expanding the National AI Research Institutes. On July 29, 2025, NSF announced $100 million in public-private investment to establish five new National AI Research Institutes and a central community hub. These institutes will translate cutting-edge AI research into scalable, practical solutions across every sector, from helping doctors detect diseases to enabling smarter manufacturing to supporting resilient agriculture, delivering concrete benefits that improve lives. They will also help build national infrastructure for AI education and workforce development, training the next generation of American AI innovators. The first cohort of NSF AI Institutes announced in 2020 has worked on key technologies behind widely used generative AI models such as Stable Diffusion 3 (University of Texas at Austin), released AI tools and curricula used by more than 6,000 middle school students and educators (University of Colorado at Boulder), and developed cutting-edge AI to speed up molecule discovery and creation for applications in medicine, materials, and clean energy (University of Illinois Urbana-Champaign).

> *"For a future stamped with the American character, the Federal government must become an early adopter and avid promoter of American technology."*
>
> – Director Michael Kratsios, April 13, 2025

Federal AI Adoption

Accelerating Federal AI Adoption. Following President Trump's Executive Order "Removing Barriers to American Leadership in AI" (EO 14179), OMB has transformed a heavily bureaucratic Federal AI landscape into one that is industry-friendly and agile. In April 2025, OMB issued revised policies on "Accelerating Federal Use of AI through Innovation, Governance, and Public Trust" (M-25-21) and "Driving Efficient Acquisition of Artificial Intelligence in Government" (M-25-22), which rescinded Biden-era policies and laid the groundwork for U.S. government AI adoption. M-25-21 AI Use guidelines communicates a culture change that is less risk-averse to AI, standardizes risk management practices, and refocuses agency Chief AI Officers on AI adoption rather than bureaucracy. M-25-22 AI

Procurement guidelines help agencies acquire best-in-class AI quickly and competitively, emphasize efficient re-use of government resources and protects against vendor lock-in.

Preventing Woke AI in the Federal Government. On July 23, 2025, President Trump signed Executive Order 14319, "Preventing Woke AI in the Federal Government," to ensure that AI models procured by the Federal Government produce reliable outputs free from harmful ideological biases or social agendas. On December 11, 2025, OMB released M-26-04 "Increasing Public Trust in Artificial Intelligence Through Unbiased AI Principles," which provides guidance to agencies on how to make informed AI procurement decisions. The guidance sets minimum and enhanced transparency thresholds to determine whether a vendor's system complies with the "Unbiased AI Principles" of truth-seeking and ideological neutrality and provides terms in Federal contracts to hold vendors accountable for noncompliance.

Providing AI Tools to the Entire Federal Workforce for $1. The General Services Administration (GSA) has taken bold actions to make best-in-class AI technology available to the Federal government. In April 2025, GSA launched its OneGov strategy to secure discounted rates on IT tools by treating the government as one customer. Through OneGov, GSA has negotiated agreements with leading American AI companies to provide advanced AI models to the entire Federal workforce for $1 or less, including a year of access to OpenAI's ChatGPT Enterprise and Anthropic's Claude for $1 per agency, Google's Gemini for $0.47 per agency, xAI's Grok for $0.42 per agency, and Microsoft 365 Copilot at no-cost under a new agreement with Microsoft. To capitalize on these discounts, OMB launched a Federal AI Adoption Sprint that directed every Cabinet and major agency to acquire and deploy two AI models for at least two AI use cases, building the policy, process, and acquisition pathways for agencies to rapidly onboard new AI capabilities. Concurrently, GSA launched FedRAMP 20x, a cybersecurity authorization pilot program to accelerate Federal use approval for cloud-based AI solutions. FedRAMP 20x provides a standardized, reusable approach to security assessment and authorization, reducing approval times from months to weeks and eliminating backlog in FedRAMP authorization.

Putting AI to Work in Transportation with Transparency and American Leadership. On October 3, 2025, the Department of Transportation released a comprehensive Artificial Intelligence Strategy that sets a clear, responsible course for deploying AI across the department. The strategy consists of three coordinated documents: an AI Use Case Alignment identifying DOT's priority applications for AI; an AI Maturity Assessment evaluating the Departments readiness to invest in, govern, and scale AI while outlining steps to elevate that maturity; and an AI Compliance Plan detailing how DOT will implement and maintain compliance with OMB Memorandum M-25-21 on accelerating Federal use of AI through innovation, governance, and public trust. Together, these actions accelerate U.S. leadership in advanced technologies and ensure that AI strengthens safety, efficiency, and performance across transportation systems.

Unleashing AI for Warfighting. On December 9, 2025, DOW launched GenAI.mil, which makes America's world-leading AI models available to over three million civilians, contractors, and military personnel, leveraging generative AI to accelerate operations and decision-making across the entire defense enterprise. The initiative will establish the necessary infrastructure for rapid and secure AI agent deployment across DOW workflows using America's leading AI models. All tools on GenAI.mil are certified for Controlled Unclassified Information and Impact Level 5, making them secure for operational use. The Department is

providing no-cost training on GenAI.mil to all DOW employees to help the department realize the full potential of the technology. On January 12, DOW launched the AI Acceleration Strategy catalyzing seven Pace-Setting Projects, across warfighting, intelligence, and enterprise applications, cementing U.S. leadership in AI-enabled warfighting

Leveraging AI for Cyber Defense. In 2025, DARPA, ARPA-H, and the White House organized the Final Competition of the Artificial Intelligence Cyber Challenge (AIxCC), a two-year initiative that brought together the best and brightest in AI and cybersecurity to safeguard the software critical to all Americans. AIxCC competitors designed novel AI systems to advance the security of critical software underlying everything from financial systems to public utilities, with cumulative prizes totaling $29.5 million to teams with the best systems. In the Final Competition at DEFCON in August 2025, competitors discovered 86% of synthetic vulnerabilities and patched 68% of those identified, including a team from the Georgia Institute of Technology that patched a real-world bug in SQLite3, a popular open-source database programming library. To advance AI adoption in cyber defense, all seven finalist teams released their AI systems as open-source tools for the broader research and cybersecurity communities.

AI Infrastructure

Accelerating American Data Center Buildout. On July 23, 2025, President Trump signed Executive Order 14318, "Accelerating Federal Permitting of Data Center Infrastructure," to facilitate the rapid buildout of data center infrastructure and covered components, including grid and energy infrastructure, semiconductors, networking equipment, and data storage. It instructs agencies to streamline environmental reviews and permitting, launches an initiative to provide Federal financial support, authorize data center construction on appropriate Federal lands, and revokes a Biden-era Executive Order that would have saddled AI data center development with pages of DEI and climate requirements. The Administration's energy dominance and permitting successes have enabled trillions of dollars of new AI infrastructure investments in the United States since January 2025.

Unleashing AI Infrastructure through Efficient Permitting. Pursuant to President Trump's Executive Order 14145 on "Unleashing American Energy," all three branches of the Federal government advanced reforms to dramatically reduce the burdens of the National Environmental Policy Act (NEPA) compliance. The Council on Environmental Quality rescinded its NEPA regulations, Congress enacted its BUILDER Act amendments, and the Supreme Court issued a landmark decision in *Seven County Infrastructure Coalition v. Eagle County*. In consultation with CEQ, the first tranche of eight Federal agencies updated their NEPA procedures on June 30, 2025—most for the first time since NEPA became law more than five decades ago. On September 29, 2025, CEQ released updated NEPA implementation guidance and agency implementing procedures template to further assist Federal agencies' efforts to update NEPA. Together, these reforms have expedited permitting approvals for critical U.S. infrastructure projects, including AI data centers, that are central to America's global AI dominance. In parallel, the Federal Permitting Improvement Steering Council (FPISC) is expediting qualified AI infrastructure projects through the FAST-41 program, which provides coordinated permitting timetables and active project management to hold permitting and environmental review agencies accountable.

Establishing Environmental Policies that Support AI Development. On March 12, 2025, EPA announced the agency would undertake 31 historic deregulatory actions to advance President Trump's Day One Executive Order on *Unleashing American Energy*. These 31 actions, many already proposed or finalized, will streamline, right-size, or repeal regulations that impose trillions in costs without commensurate benefits. EPA's actions address burdensome regulations impacting water, air, and climate rules for power plants, oil and gas companies, vehicle emissions, and manufacturing and industrial facilities, in order to unleash American energy and lower the cost of living for American families. These actions will make it more affordable to bring infrastructure like automotive manufacturing and AI data centers into local communities, creating new American jobs and increased wages.

Incentivizing AI Infrastructure Buildout. Since President Trump took office in January 2025, his unwavering commitment to revitalizing American industry has spurred the largest AI infrastructure buildout in history with trillions of dollars in private investment. These investments will bring advanced manufacturing back to the United States, secure critical AI infrastructure supply chain components, and create new high-skilled jobs across the country. On July 4, 2025, President Trump signed the One Big Beautiful Bill Act, which permanently extended 100% bonus depreciation for qualified property, strengthening cash flow and accelerating private investment in capital-intensive AI infrastructure such as servers, networking hardware, and facility improvements. These tax and permitting reforms have created jobs and opportunities for working families, highlighted by President Trump's announcement of more than $90 billion in new investments at the *Pennsylvania Energy and Innovation Summit* in July 2025.

President Trump and industry CEOs at the Pennsylvania Energy and Innovation Summit. (July 15, 2025)

Launching the Largest AI Infrastructure Project in History. On his second day back in office, President Trump announced Stargate, a joint venture between U.S. and partner country technology companies to build next-generation AI infrastructure in the United States. Stargate plans to invest $500 billion over four years to construct up to 20 large AI data centers, beginning with an immediate $100 billion investment in a flagship project in Abilene, Texas. In September 2025, Stargate announced five new U.S. AI data center sites in Texas, New Mexico, Wisconsin, and Ohio, bringing total planned capacity to 7 gigawatts and more than $400 billion in investment over three years. Enabled by President Trump's leadership, Stargate's AI infrastructure buildout will strengthen American leadership in AI and create over 100,000 American jobs.

Strengthening Electric Grid Reliability. On April 8, 2025, President Trump signed Executive Order 14262 "Strengthening the Reliability and Security of the United States Electric Grid," directing the Federal government to ensure a reliable supply of energy that meets the country's growing needs and can power America's AI boom and re-industrialization. The Administration has prioritized using all available sources of energy to strengthen grid reliability, including revitalizing America's coal industry and removing regulatory barriers to oil and natural gas production. On May 1, 2025, EPA issued a regulatory interpretation allowing reciprocating internal combustion engines (RICE) to operate up to 50 hours per year in non-emergency conditions to power America's grid, without violating Clean Air Act standards. The interpretation provides greater certainty for utilities and data center operators that rely on RICE for backup power.

Accelerating Speed to Power. On September 18, 2025, DOE launched the Speed to Power Initiative and to accelerate the speed of large-scale grid infrastructure project development for both transmission and generation. DOE is currently reviewing responses to its Request for Information to incorporate stakeholder input for how to best leverage its funding programs and authorities to rapidly expand energy generation and transmission grid capacity. This initiative will ensure the United States has the power needed to win the global AI race while continuing to meet growing demand for affordable, reliable and secure energy.

Increasing Abundant and Reliable Baseload Power for AI Data Centers. EPA, DOE, and FERC are advancing regulatory reforms to strengthen the abundance and resilience of baseload power for everyday consumption and AI data centers, with a focus on expanding electricity transmission, pipeline development, and distributed energy resilience in high-need regions. On June 11, 2025, EPA proposed repealing the greenhouse gas and carbon pollution standards for all fossil fuel power plants under Section 111 of the Clean Air Act, including New Source Performance Standards for coal and gas power plants. This proposal would save an estimated $19 billion in compliance costs, enabling savings to be passed down to consumers. In October 2025, EPA also extended compliance deadlines for several categories of power generators, allowing facilities to stay online longer and invest in reliability and efficiency upgrades.

Fast-Tracking Interconnection for Data Centers. On October 24, 2025, the Secretary of Energy directed FERC to initiate rulemaking procedures to accelerate the connection of data centers to the power grid. The proposed rule applies to "large loads" greater than 20 megawatts and encourages customers to file joint, co-located load and generation interconnection requests, significantly reducing study timelines and grid upgrade costs. Under DOE's proposal, data centers could receive expedited reviews of fewer than 60 days—for a process that can currently drag on for years—if they include new power plants with their

facilities or agree to curtail usage in response to grid strain during high-demand periods, such as heatwaves. FERC's rulemaking would promote behind-the-meter energy generation, a priority highlighted by President Trump during his speech at the launch of America's AI Action Plan, and ensure affordable, and reliable electricity for American families and critical technology industries.

Opening Federal Lands for AI Infrastructure. Pursuant to President Trump's Executive Order on AI Infrastructure (EO 14318), DOE selected four sites on DOE lands on July 24, 2025 to invite private sector partners to rapidly develop cutting-edge AI data centers and energy infrastructure. The selected sites, Idaho National Laboratory (INL), Oak Ridge Reservation, Paducah Gaseous Diffusion Plant and Savannah River Site, are uniquely positioned to host data centers and new power generation that will bolster grid reliability, reduce energy costs, and reinforce American leadership in AI. Throughout Fall 2025, DOE issued solicitations for all four sites and convened industry days for prospective developers, including an event at INL that drew more than 800 participants. Similarly, the Navy, Air Force, and Army have issued solicitations to use their lands to support industry-led data center development. EPA is also identifying additional Federal sites suitable for AI data center development, launching the Superfund Redevelopment Mapper, a GIS tool that showcases Superfund and Brownfield sites available for redevelopment. The map is overlaid with energy sources, utilities, permitting requirements, and additional information from the Department of the Interior, maximizing developers' access to information for evaluating potential sites for constructing data center infrastructure. Efforts across DOE, DOW, DOI, and EPA to open Federal lands will accelerate data center development by expediting permitting, streamlining NEPA reviews, and reducing state and local barriers.

Ensuring Secure-By-Design AI Infrastructure. Consistent with America's AI Action Plan, Federal agencies are bolstering critical infrastructure cybersecurity and advancing secure-by-design AI technologies. In June 2025, DOE's Office of Cybersecurity, Energy Security, and Emergency Response launched the AI For Operationally Resilient Technologies and Systems initiative. It applies cutting-edge AI tools to protect against AI-enabled attacks on energy infrastructure; promote energy security through threat detection, enhanced network monitoring and anomaly detection, and automated supply chain testing tools; and secure AI systems used to operate, control, or defend U.S. energy systems.

Modernizing Permitting Technology and Data for the 21st Century. On April 15, 2025, President Trump issued a Presidential Memorandum, "Updating Permitting Technology for the 21st Century," to address outdated technology, fragmented data management, and lack of transparency in the Federal environmental review and permitting process. In response, CEQ established a Permitting Innovation Center on April 30 and released the Permitting Technology Action Plan on May 30, setting a government-wide strategy to digitize permit applications, expedite reviews, enhance interagency coordination, and provide industry more transparency and predictability on project review schedules. CEQ also issued the initial NEPA and Permitting Technology Data Standard on May 30, with version 1.2 released on August 18, creating a common format for NEPA and permitting datasets to facilitate interoperability and automatic data exchange across Federal systems. On June 5, 2025, CEQ, in collaboration with GSA's Technology Transformation Services, launched the Categorical Exclusion Explorer, a searchable, machine-readable public database of categorical exclusions that allows stakeholders to build their own tools to accelerate permitting across a range of infrastructure projects.

Launching PermitAI and NEPATEC 2.0. In August 2025, DOE's Pacific Northwest National Laboratory publicly released NEPATEC 2.0 through its PermitAI project, converting decades of scattered NEPA records into an AI-ready resource. The dataset consolidates more than 120,000 NEPA documents associated with 60,000 projects across over 60 Federal agencies—records that were previously siloed and stored in formats unsuitable for modern data processing. Using AI, the documents were enriched with metadata aligned with CEQ's NEPA and Permitting Technology Data Standard, enabling the development of AI tools that support faster, more consistent permitting. PermitAI is also beta-testing an AI tool to summarize public comments responding to environmental regulations and Requests for Information, saving weeks of manual review time. To date, six Federal agencies have signed agreements with DOE to use PermitAI to accelerate permitting for critical infrastructure projects without compromising review quality.

Increasing Air Permit Certainty for Data Center Developers. On December 11, 2025, EPA launched the *Clean Air Act Resources for Data Centers* webpage, providing data center developers, local communities, and Tribes with a central hub for Clean Air Act (CAA)-related resources. The webpage includes regulatory information, air permitting guidance, and technical modeling tools to help data centers developers prepare permit applications and demonstrate compliance with CAA air quality standards. Throughout 2025, EPA also provided regulatory clarity to support U.S. AI infrastructure development while protecting public health. Most notably, on September 9, 2025, EPA issued guidance to facilitate construction activities for essential power generation projects that are not related to air emissions, reducing delays without compromising environmental safeguards.

Increasing Water Permit Certainty for Data Center Developers. On November 17, 2025, EPA announced a proposed rule that would establish a common-sense definition of "waters of the United States" under the Clean Water Act. The proposal provides clarity by reducing the patchwork of interpretations that can delay multi-state siting and permitting for large-scale infrastructure projects around wetlands and surface waters, shortening project timelines and lowering risk for data center developers. On January 8, 2026, the U.S. Army Corps of Engineers re-issued nationwide permits to streamline authorizations under the Clean Water Act and the Rivers and Harbors Act of 1899, including allowing AI facilities and data centers to qualify for streamlined provisions.

"Without the semiconductors, there is no economy—powering everything from AI to automobiles to advanced manufacturing—and we must produce them here in America."

– President Donald J. Trump, March 3, 2025

Semiconductors & AI Chips

Securing the Largest Foreign Direct Investment in American History. On March 3, 2025, President Trump announced a historic $100 billion investment from TSMC to expand its Arizona semiconductor operations, bringing the company's total U.S. investment to $165 billion. The investment includes five cutting-edge fabrication facilities, two advanced

packaging plants, and a major R&D center that will produce chips powering AI, data centers, and smartphones. The expansion is expected to create 40,000 construction jobs over four years and thousands of permanent high-paying manufacturing positions, cementing Arizona as a global hub for advanced semiconductor production.

Establishing the United States Investment Accelerator. On March 31, 2025, President Trump signed Executive Order 14255 "Establishing the United States Investment Accelerator," creating a new office in the Department of Commerce to facilitate and expedite investments above $1 billion in the United States. The Investment Accelerator supports major infrastructure projects, such as AI data centers and semiconductor manufacturing facilities, by reducing regulatory burdens, accelerating permitting, coordinating across Federal agencies to reduce issues for investors, expanding access to Federal resources, and facilitating collaboration with DOE National Laboratories and state governments. The Investment Accelerator also assumed responsibility for the CHIPS Program Office, advancing its mission to revitalize domestic semiconductor manufacturing to build U.S.-based facilities and equipment without burdening taxpayers.

Investing in the Domestic Semiconductor Industry. On August 22, 2025, the Trump Administration reached an agreement to take a passive 9.9% stake in Intel through an $8.9 billion investment, which supports domestic chip production to ensure the hardware behind AI data centers, cars, smartphones, and critical infrastructure is built in the U.S. and is less dependent on global supply chains. Already, the U.S. investment has grown more than 70% while supporting $100 billion expansion of U.S. manufacturing, helping keep high-skill jobs and rebuild industrial capacity at home.

Addressing China's Unfair Semiconductor Industry Practices. On January 14, 2026, President Trump issued a Section 232 proclamation to promote U.S. semiconductor investment and production while reducing reliance on foreign sources and supply chains. While semiconductors are used across all 16 critical infrastructure sectors, the U.S. produces only 10% of the chips it requires. To address long-term reliance on foreign sources, the proclamation describes a tariff approach that gradually incentivizes onshoring critical semiconductor production capacity. On December 23, 2025, the Office of the U.S. Trade Representative took actions under Section 301 to push back against China's semiconductor policies that unduly disadvantage the U.S. semiconductor industry. The new tariff will enter into effect in 18 months, covering chips used for advanced AI hardware. By reinvigorating domestic semiconductor manufacturing and reducing U.S. dependence on adversaries' state-backed chip supply, these actions strengthen U.S. economic security and maintain our lead across critical and emerging industries.

Restoring American Memory Chip Manufacturing Leadership. On June 12, the Department of Commerce announced a $200 billion investment commitment from Micron Technology to dramatically expand American memory chip production in Idaho, New York, and Virginia. President Trump's Investment Accelerator is partnering with Micron to expedite the project's permitting requirements and reduce bureaucratic slowdowns. As the only U.S.-based manufacturer of advanced memory chips, Micron's investment will bring the full spectrum of memory chip production back to the United States. The expansion includes new fabrication facilities, advanced high bandwidth memory packaging capabilities, and R&D operations that will create tens of thousands of American jobs and secure domestic supply chains for AI, automotive, and defense applications.

Advancing Next-Generation Chipmaking. In December 2025, Commerce and NIST announced a preliminary letter of intent for up to $150 million in proposed CHIPS incentives to xLight to build and demonstrate a free electron laser prototype as an alternative light source for extreme ultraviolet lithography, along with $150 million of equity for the Department of Commerce. Investment into EUV lithography, a key technology for manufacturing microchip transistors beyond the 7 nm node, decreases costs for commercial fabs and advances U.S. leadership in advanced chipmaking.

Applying Federal Financing Tools for Domestic Semiconductor Manufacturing. In October 2025, CHIPS for America reopened and amended its second funding opportunity for facilities supporting semiconductor materials and manufacturing equipment, aiming to broaden participation in upstream parts of the semiconductor ecosystem. The program is part of the Administration's strategy to bring domestic manufacturing and the associated jobs back to the U.S., supporting chip production for AI and other critical industries. In September 2025, NIST released a funding call for research, prototyping, and commercial solutions to advance U.S. microelectronics. The program prioritizes AI for advanced microelectronics R&D, alongside advanced semiconductor technologies, commercialization, and standards development. These investments will help translate American discoveries from labs to factories, rebuilding domestic production pathways for semiconductors and other microelectronics.

International AI Engagement

Launching the American AI Exports Program. On July 23, 2025, President Trump signed Executive Order 14320 "Promoting the Export of the American AI Technology Stack," which established the United States' signature AI diplomacy initiative, the American AI Exports Program. The program will facilitate the export of secure, full-stack American AI technology packages to allies and partners worldwide, recognizing that the true measure of AI leadership is domestic and global adoption, not just building frontier models. By exporting American AI, the United States will ensure that it leads in developing and deploying AI technologies, standards, and regulatory frameworks to reduce global reliance on systems from adversarial nations. The Department of Commerce launched the program on October 21, 2025, including a new website and a Request for Information from U.S. and global technology companies. Concurrently, the Department of State has developed a unified U.S. government strategy for facilitating AI exports that addresses country and industry engagement, market access and trade barriers, financing and trade policy, and development and technical capacity to adopt the American AI stack.

Securing Historic Investments in the Domestic AI Supply Chain. As the dealmaker in chief, President Trump has secured trillions in investments to bring back "Made in America," including in AI infrastructure. On March 21, 2025, President Trump secured a $1.4 trillion investment from the United Arab Emirates (UAE) to support U.S. AI infrastructure, semiconductors, energy, and manufacturing, including commitments to finance and construct world-class U.S. data centers. Building on this momentum, in July 23, 2025, President Trump announced a landmark U.S.-Japan Strategic Trade and Investment Agreement, under which Japan committed $550 billion to revitalize America's strategic industrial base, including energy infrastructure and semiconductor manufacturing. On October 28, 2025, President Trump secured additional commitments from Japan to invest up to $402 billion to strengthen domestic AI infrastructure supply chains, targeting key

bottlenecks to U.S. data center buildout, including small modular reactors, substations, transformers, cooling systems, and large-scale power equipment such as gas turbines, steam turbines, and generators.

Launching Pax Silica to Secure Supply Chains. In December 2025, the United States launched Pax Silica, an effort among U.S. allies and trusted partners to build secure and resilient supply chains for semiconductors and critical minerals that enable the AI boom. That month, the United States hosted the Pax Silica Summit, where partner nations signed the Pax Silica Declaration, a shared vision of economic and technology cooperation across raw materials and semiconductor supply chains. To date, eight countries have signed the Pax Silica declaration: Japan, the United Kingdom, Australia, Israel, Singapore, the Republic of Korea, the United Arab Emirates, and Qatar.

AI Workforce

Scaling Registered Apprenticeships. On April 23, 2025, President Trump signed Executive Order 14278 "Preparing Americans for High-Paying Skilled Trade Jobs of the Future," which created a National strategy to invest and develop the American workforce and expand the Registered Apprenticeships to surpass 1 million new apprentices. To implement the President's American worker-first mandate and to build the AI workforce of the future, DOL established a comprehensive three-part approach to expand AI-related apprenticeships nationwide: expanding AI literacy across all apprenticeship occupations, growing programs for AI-centric roles that directly build or manage AI technologies, and scaling programs for AI infrastructure occupations like electricians and HVAC technicians who build data centers and digital infrastructure. On December 10, DOL released a Request for Information to identify industry intermediaries to execute this framework by integrating AI education across Registered Apprenticeship programs nationwide. This initiative ensures apprentices gain essential AI skills to thrive in an AI-driven economy while building the workforce needed for America's AI infrastructure buildout. On January 6, DOL released a forecast notice for $145 million in anticipated funding to expand registered apprenticeships in AI infrastructure and other critical industries. The funding uses an innovative pay-for-performance model that ensures accountability by rewarding partners only when they deliver results in creating new apprenticeship programs and expanding existing ones in critical industries.

Funding Industry-Driven Training for AI and Other Critical Industries. On September 30, DOL awarded more than $86 million in Industry-Driven Skills Training Fund grants to 14 states to train workers in high-demand and emerging industries, with significant investments in AI infrastructure and related occupations. The grants provide outcome-based reimbursements to employers for training workers in AI-related fields as well as advanced manufacturing, shipbuilding, aerospace and defense, nuclear energy, and domestic mineral production. This investment strengthens talent pipelines for data centers, digital infrastructure, and other critical industries being revitalized by the Trump Administration. On December 22, 2025, the Economic Development Administration (EDA) also set aside $25 million in grant funding for workforce initiatives to support the President Trump's AI Action Plan and support American jobs created by the boom in AI infrastructure buildout.

Establishing the U.S. Tech Force. On December 15, 20205, the White House launched the U.S. Tech Force a new, cross-government program to recruit an elite corps of engineers to build the next generation of government technology. The two-year program will build teams

of software engineers, AI specialists, and senior managers to modernize government technology and promote AI adoption. Leading technology companies partnering with the Tech Force will provide technical training and senior managers for the participants. As of early January 2026, the Tech Force has received about 35,000 submissions of interests, and is aiming to recruit and onboard around 1,000 technologists in 2026, advancing U.S. leadership in AI adoption.

"We are living in a moment of wonder, and it is our responsibility to prepare America's children."

– First Lady Melania Trump, September 9, 2025

AI & Children's Wellbeing

Advancing AI Education for American Youth. On April 23, 2025, President Trump signed Executive Order 14277 "Advancing Artificial Intelligence Education for American Youth," which will give America's youth the education and workforce development opportunities that will foster interest and cultivate expertise in AI from an early age, equipping the next generation of American AI innovators. The Executive Order established the White House Task Force on AI Education, launched the Presidential AI Challenge, which encourages educators and students to develop AI literacy, and established the Pledge to America's Youth, which has secured over $1 billion in commitments from public-private partnerships with more than 200 major organizations to provide resources for K-12 AI education. Since the announcement of the Challenge, over 16,000 students and educators have registered across all 50 states, and will be applying AI tools and methods to address community challenges and creative applications in K-12 learning. First Lady Melania Trump has been a champion for the Administration's K-12 AI education efforts, helping launch the Challenge and hosting a widely-attended and successful Task Force meeting alongside private sector leaders from the American AI industry.

Providing Student Access to Top Educational AI Tools. On July 4, 2025, President Trump signed the One Big Beautiful Bill Act into law, codifying the first-of-its-kind Federal School Choice Tax Credit (FSCTC). The FSCTC enables donors to scholarship granting organizations to receive dollar-for-dollar tax credits for donations that provide education technology scholarships, including generative-AI-powered tutoring services for personalized learning and around the clock availability for student academic needs. The FSCTC, usable starting in January, 2027, will revolutionize AI adoption for our nation's future leaders, technicians, entrepreneurs, and more in and out of the classroom.

Prioritizing AI Literacy for American Youth. On August 26, pursuant to President Trump's Executive Order on Youth AI Education, DOL issued guidance to states on using Workforce Innovation and Opportunity Act (WIOA) grants to bolster AI literacy and training across the public workforce system. The guidance encourages states and local workforce development boards to use WIOA Title I funding to support AI literacy among participants in Youth, Adult, and Dislocated Worker programs, and encourages states to use Governor's Reserve funds to integrate AI learning opportunities into programming. This action ensures American workers can acquire the foundational AI skills necessary to share in the economic prosperity that AI will

create. On December 30, DOL also announced the availability of $98 million in YouthBuild funding to support pre-apprenticeships that integrate AI literacy skills for young people ages 16 to 24. For the first time, the program requires applicants to incorporate AI literacy into the education component and encourages AI integration in occupational skills training. This investment prepares youth with foundational AI skills across construction, advanced manufacturing, information technology, and healthcare careers.

Launching Fostering the Future Together. On September 23, at the 80th session of the U.N. General Assembly, the First Lady launched a global coalition for Fostering the Future Together to ensure the digital wellbeing of children across the world through promoting education, innovation, and technology. The initiative's priorities are to guide the development of children in the digital age and collaborate across the private sector to ensure children benefit from the AI era.

Protecting Children from Non-Consensual Deepfakes Online. On May 19, 2025, President Trump signed the bipartisan TAKE IT DOWN Act, a key initiative championed by First Lady Melania Trump, marking a significant step to protect Americans from the nonconsensual distribution of intimate images and digitally altered explicit content. The legislation strengthens federal penalties for the creation and spread of such material and establishes clearer requirements for online platforms to respond to and remove harmful content. By setting clear and targeted guardrails for AI misuse, the law demonstrates an appropriate balance of strengthening public trust without unduly limiting AI innovation.

First Lady Melania Trump with military families at Camp Lejeune. (November 19, 2025)

Quantum Technology

"The American pioneer spirit still seeks the exploration of endless frontiers. Our technologies, and what we do with them, will be the tools with which we will make the destiny of our country manifest in this century."

– Director Michael Kratsios, April 14, 2025

Like AI, the Trump Administration views quantum information science and technology (QIST) as a new frontier of scientific discovery and a key pillar of economic prosperity and national security. Breakthroughs in QIST have the potential to revolutionize the ways Americans sense, communicate, and compute, sparking entirely new technologies and industries. As quantum technologies mature and become increasingly available on the commercial market, American leadership in QIST will require advancing fundamental science while aligning quantum research with national priorities, tackling emerging engineering challenges, and strengthening enabling technologies for the quantum ecosystem. In 2025, the Administration has moved decisively to realize the enormous potential of QIST, including renewing five new National Quantum Information Science Research Centers at the Department of Energy, exploring utility-scale quantum computer concepts through DARPA's Quantum Benchmarking Initiative, and prioritizing quantum R&D in Federal funding.

Beyond research, the Administration is working to translate American quantum innovation into American quantum industries. Defense and Federal laboratory partnerships are advancing manufacturable quantum systems. International cooperation with key partners is helping secure quantum supply chains and establish the measurements and standards needed for commercialization. And nation-wide initiatives are catalyzing billions in public and private investment, fostering small business ecosystems, and building the workforce pipeline needed to sustain American quantum leadership for decades to come.

President Trump's actions to restore American dominance in QIST build directly on the historic leadership of his first term. In 2018, President Trump signed the National Quantum Initiative Act (NQIA), launching the first whole-of-government strategy to advance QIST. The NQIA established the National Quantum Coordination Office to coordinate R&D across more than a dozen Federal agencies, and advance national strategies for QIST. During President Trump's first term, the Administration also launched major QIS institutes including $75 million for three NSF Quantum Leap Challenge Institutes and up to $625 million over five years for QIS Research Centers at DOE National Laboratories, complemented by over $300 million in industry and academia contributions. These investments supported critical, fundamental R&D that laid the groundwork for American leadership in commercial QIS-enabled technologies.

Highlights

Quantum R&D

Advancing U.S. Leadership in Quantum Information Science. Bolstered by President Trump's support of cutting-edge quantum technology, the U.S. quantum industry has seen dramatic technical advances in 2025. Many U.S. companies have either made significant improvements in the scale of their quantum processors, or in the operational performance, and in many cases both simultaneously. This has enabled dramatic improvements in the capabilities of quantum processors across many different hardware modalities. U.S. companies have also made numerous breakthroughs in understanding how to operate a quantum processor, including improvements to how logical qubits are controlled and how quantum devices can interface with classical devices. Industry has seen dramatic increases in the stock price for publicly-traded, pure-play quantum companies, and quantum companies have announced multiple partnerships to bring the best-in-breed U.S. technologies together to accelerate innovation.

Renewing Investment in the National Quantum Centers. On November 4, 2025, DOE announced $625 million in funding to renew its five National Quantum Information Science Research Centers (NQISRC), which were initially awarded under the National Quantum Initiative Act signed into law by President Trump in 2018. Each NQISRC will support fundamental R&D with disruptive potential across quantum computing, simulation, networking, and sensing; develop tools, equipment, and instrumentation that unlocks new QIS capabilities; apply QIS to DOE's most pressing scientific and national security challenges; and establish industry and workforce partnerships to strengthen the QIS ecosystem.

Prioritizing Quantum Research Funding. The Trump Administration has prioritized AI and quantum across budget requests and guidance to Federal research agencies. President Trump's Fiscal Year 2026 Discretionary Funding Request maintains funding for QIST research. On September 23, 2025, OSTP released M-25-34/NSTM-2, "Fiscal Year 2027 Administration Research and Development Budget Priorities and Cross-Cutting Actions," which highlighted the importance of advancing basic quantum information science, while also prioritizing R&D that expands the understanding of end user applications and supports the maturation of critical technologies enabling the quantum ecosystem.

Advancing Quantum Applications in DOE Missions. In 2025, DOE released several funding opportunities that advance the application of quantum information science across its mission areas. The Office of Advanced Scientific Computing Research called for proposals on the codesign of quantum algorithms and error correction protocols for DOE mission applications, supporting end-to-end software toolchains to operate quantum systems at scale. The Office of High Energy Physics issued a call for Quantum Outposts on the Energy and Intensity Frontiers to accelerate theoretical and experimental research in fundamental physics by leveraging QIS tools, techniques, and technologies.

Quantum Computing

Assessing Quantum Computing's Potential. On November 6, 2025, DARPA moved 11 quantum computing companies into the second stage of the Quantum Benchmarking

Initiative, which aims to determine whether an industrially useful quantum computer can be built faster than conventional timelines predict. In this stage, DARPA will assess the credibility of each company's R&D plan to achieve utility-scale quantum computing before 2033. These companies represent a wide range of quantum bit (qubit) technologies, the core building blocks of a quantum computer, each with distinct advantages and technical challenges. They join two companies that advanced to the third and final stage of the program in February 2025, where their utility-scale quantum computer concepts are undergoing rigorous verification and validation. To support and expand DARPA's efforts, President Trump appropriated $250 million through the One, Big, Beautiful Bill.

Applying Supercomputers to Understand Quantum Hardware. Researchers used existing advanced computing infrastructure at DOE's National Energy Research Scientific Computing Center (NERSC) to perform an unprecedented simulation of a quantum microchip, a key step toward improving next-generation quantum hardware. Modeling quantum chips allows researchers to understand their function and performance before fabrication, ensuring they work as intended and identifying potential issues early. The simulation used over 7,000 NVIDIA GPUs on the Perlmutter supercomputer at NERSC—almost its full capacity—for 24 hours to capture the structure and function of a multi-layered chip measuring just 10 millimeters square and 0.3 millimeters thick, with etchings just one micron wide.

Advancing Manufacturable Quantum Systems. The Air Force Research Laboratory (AFRL), the primary R&D center for the U.S. Air Force, has established multiple industry partnerships to advance quantum technologies. In April 2025, AFRL signed a $10.8 million contract with PsiQuantum to deliver novel quantum chip capabilities. AFRL will use PsiQuantum's advanced quantum chipset manufacturing to explore designs relevant to Air Force use cases. In addition, AFRL partnered with memQ under a cooperative research and development agreement to enable a breakthrough approach that blends the science of quantum technologies with proven, existing semiconductor manufacturing processes to deliver reliable production of quantum networking components at scale.

Advanced Quantum Applications

Testing Quantum Sensors in Space. On August 21, 2025, the Air Force Rapid Capabilities Office partnered with the Defense Innovation Unit and AFRL to test the first strategic-grade quantum sensor is space during the eighth mission of the X-37B Orbital Test Vehicle. This sensor measures acceleration and rotation at an unprecedented precision for an orbital vehicle. Quantum sensors of this type are expected to enable new strategic capabilities across a wide range of environments, both terrestrial and in space.

Advancing Science through Quantum Randomness. On June 11, 2025, researchers at the National Institute of Standards and Technology (NIST) and its partners at the University of Colorado Boulder built the first random-number-generator that uses quantum entanglement to produce verifiably random numbers. The service leverages a blockchain-based protocol to trace and verify every step in the randomness generation process. Random numbers are important to several aspects of experimental science, but they also play an important role in information security, encryption, and everyday applications such as selecting jury candidates or assigning resources through a public lottery.

Enabling Deep-Space Communication. NASA demonstrated a real-time optical communications receiver for deep space missions including cislunar, Mars, and beyond.

Optical communications use infrared light rather than radio waves to encode and transmit information to and from Earth, and will enable missions to transfer 10 to 100 times more data back to Earth. The receiver is built on quantum single-nanowire single photon detectors. The system successfully performed in space-to-ground field demonstrations over a range of downlink modulation and coding schemes, achieving Technology Readiness Level 6. It will be deployed in the Optical Artemis II Orion (O2O) ground station transceivers.

Developing Robust Quantum Sensors. In February 2025, DARPA launched the Robust Quantum Sensors program to develop quantum sensors that resist performance degradation in dynamic, real-world conditions subject to vibration, electromagnetic interference, and other environmental disruptions. Ensuring reliable operation without sacrificing sensitivity is essential to transitioning quantum sensing from the laboratory to deployment on Department of War platforms.

Expanding Access to Foundational Tools for Quantum Research. On November 18, 2025, DOE announced a partnership between the Fermi National Accelerator Laboratory (Fermilab) and Qblox to produce and distribute the Quantum Instrumentation Control Kit (QICK) in the United States. Developed by Fermilab, QICK is an open-source platform to coordinate control and readout for quantum devices, and plays a critical role in synchronizing quantum processes and sensors. Under the partnership, Qblox will lead U.S. manufacturing, distribution, and supply chain operations of QICK, broadening access for researchers in industry and universities, while bolstering quantum workforce development.

Quantum Commercialization

Advancing International Quantum Cooperation. In September 2025, the United States, Republic of Korea, and Japan convened in Seoul and Tokyo for two trilateral workshops on quantum industrial security. The workshops brought together experts from government and industry to share best practices and discuss how to protect our quantum ecosystems from physical, cyber, and intellectual property threats. The partnership is helping safeguard innovation and strengthen the quantum ecosystem, which promises to increase human flourishing and the economic prosperity of Americans and our partners. On November 4, NIST partnered with other National Metrology Institutes from the G7 countries and Australia to launch a quantum alliance, the NMI-Q, to coordinate on the development of measurements and standards that will support commercialization and deployment of quantum technologies and counter China's development and proliferation of problematic quantum standards.

Growing State-Level Interest in Quantum. Bolstered by the acceleration of quantum innovation under President Trump, 2025 saw a number of states start quantum initiatives. Maryland announced the Capital of Quantum Initiative—a landmark public-private partnership between the State of Maryland, the University of Maryland (UMD), and private and Federal partners that will catalyze $1 billion in QIST investments. With the launch of the initiative, UMD will recruit leading quantum scientists to join over 200 quantum faculty, expand hands-on access to quantum computers, support quantum-focused projects at its Applied Research Laboratory for Intelligence and Security, and launch workforce programs spanning high school curricula to workforce retraining. In addition, the Texas Quantum Initiative was signed into law in June 2025, establishing a grant fund to support research, workforce training, and quantum manufacturing efforts with the goal of making Texas as a national leader in quantum innovation. Under President Trump's leadership, Federal

departments and agencies are partnering with state-level initiatives to ensure quantum technologies deliver benefits to Americans across the country.

Nuclear Technologies

"We are restoring a strong American nuclear industrial base, rebuilding a secure and sovereign domestic nuclear fuel supply chain, and leading the world towards a future fueled by American nuclear energy."

– Director Michael Kratsios, May 23, 2025

The Nuclear Energy Renaissance is essential to help America secure global industrial, digital, and economic dominance, achieve energy independence, and strengthen our security. Nuclear energy is also key to advancing next generation technologies—powering AI computing infrastructure and critical military installations alike.

To advance this Renaissance, the Trump Administration is enabling our private sector to develop and rapidly deploy advanced nuclear technologies. In May 2025, President Trump signed four Executive Orders directing Federal agencies to expedite and promote the production of nuclear energy, securing a reliable power source for reindustrialization and stable grid prices for American households. The Trump Administration is also streamlining National Laboratory processes for reactor testing at the Department of Energy and reforming the Nuclear Regulatory Commission (NRC) to reduce our dependence on foreign technologies, decrease regulatory barriers, and support our domestic nuclear industry.

Under President Trump's leadership, the new Nuclear Renaissance will also extend from Earth out into the reaches of space. President Trump's December 2025 Executive Order on "Ensuring American Space Superiority" directs the deployment of nuclear reactors on the Moon and in orbit, including a lunar surface reactor ready for launch by 2030, under a coordinated National Initiative for American Space Nuclear Power.

President Trump's 2025 actions to advance and enable American nuclear energy leadership build upon ground he laid during his first Administration. His January 2021 Executive Order on "Promoting Small Modular Reactors for National Defense and Space Exploration" paved the way for development of an advanced transportable microreactor prototype that is on track for testing and deployment by the U.S. Army beginning in 2026. The President's December 2020 Space Policy Directive 6 (SPD-6) established a National Strategy for Space Nuclear Power and Propulsion, and affirmed that using space nuclear power and propulsion systems safely and securely is vital to maintaining and advancing United States dominance and strategic leadership in space. To enable such use, President Trump's August 2019 National Security Presidential Memorandum-20 (NSPM-20) on "Launch of Spacecraft Containing Space Nuclear Systems" also established transparent safety guidelines that are forward-looking and amenable to effective use of space nuclear systems for heating, power, and propulsion.

President Donald Trump signs executive orders regarding nuclear energy in the Oval Office. (May 23, 2025)

Highlights

Nuclear Energy

Accelerating Advanced Reactor Testing. On May 23, 2025, President Trump issued an Executive Order on *Reforming Nuclear Reactor Testing at the Department of Energy*, directing DOE to initiate the Reactor Pilot program to establish a new regulatory pathway for multiple advanced microreactor industry teams to move their technologies towards deployment. DOE established the Reactor Pilot program in June 2025 and has accepted 11 projects into the program to fast-track commercial licensing and help unlock significant capital to advance nuclear technology. The Reactor Pilot program leverages DOE authorization to expedite the research and development of advanced nuclear reactor technologies and is on track to achieve criticality in at least three test reactors by July 4, 2026. This program has been enabled by DOE's newly streamlined directives and technical safety standards, accelerated development of microreactor testbeds at Idaho National Laboratory including the DOME, and codifying enhanced DOE/NRC cooperation and harmonization to streamline the path from DOE-authorized demonstrations to NRC-licensed deployments. Harmonization of both agencies' processes and technical exchanges is conducted in a fully cooperative and transparent manner to support the responsible commercialization of advanced reactors.

Enabling a Nuclear Renaissance. On May 23, 2025, President Trump issued an Executive Order on "Reinvigorating the Nuclear Industrial Base," establishing that "It is the policy of the United States to expedite and promote to the fullest possible extent the production and operation of nuclear energy to provide affordable, reliable, safe, and secure energy to the American people, to power advanced nuclear reactor technologies, and to build associated supply chains…maximize the efficiency and effectiveness of nuclear fuel through recycling, reprocessing, and reinvigorating the commercial sector." The Order directs actions to strengthen the domestic nuclear fuel cycle; prioritize funding for restart, completion, uprate, or construction of nuclear plants; and expand the nuclear energy workforce.

Crosscutting Nuclear Energy Research and Development Supporting Nuclear Energy Deployment. DOE's crosscutting programs accomplished milestones in support of multiple nuclear related Executive Orders (EO)s like the EO 14302, EO 14301, and EO 14299. Meeting the EO mandates, DOE's Nuclear Energy Advanced Materials and Manufacturing Technologies, Nickle-based super alloys made without cobalt development was recognized as one of the *11 big wins for Nuclear Energy in the Trump Administration's first 100 days* as the material of choice for many applications such as nuclear reactors and space vehicles due to their durability in extreme environments. Since June 5, 2025, DOE announced the selection of 13 vouchers through the Gateway for Accelerated Innovation in Nuclear (GAIN) program to accelerate the cost-effective commercialization of innovative nuclear technologies by facilitating access to world-class expertise and capabilities across the DOE National Laboratory complex.

Restarting American Nuclear Energy. On June 4, 2025, DOE released the fourth loan disbursement of a up to $1.52 billion loan guarantee to Holtec, to help fund the restart of the Palisades Nuclear Plant, which is scheduled to restart in early 2026. On November 15,2025 DOE closed a $1 billion loan to Constellation Energy Generation to help finance the restart of the Crane Clean Energy Center (Crane) nuclear power plant in Londonderry Township, Pennsylvania. These loan guarantees support President Trump's Executive Order on "Reinvigorating the Nuclear Industrial Base," which directs the DOE to facilitate, in addition to the first such nuclear restarts in U.S. history, at least 5 gigawatts of power uprates for existing reactors and the construction of at least 10 new large reactors by 2030, ensuring American's have access to reliable, abundant, and affordable energy.

Building a Domestic Nuclear Fuel Supply for Advanced Nuclear Reactors: On July 16, 2025, DOE announced the start of a new pilot program to strengthen domestic supply chains for nuclear fuel fabrication capabilities and accepted qualified U.S. companies to build and operate nuclear fuel production lines using the DOE authorization process. In 2025, DOE also issued a request for applications to establish a program for making surplus plutonium materials available to industry for advanced nuclear technologies. In 2025, DOE also signed conditional commitments with eight reactor developers, finalizing two contracts for fuel allocation from the HALEU Availability Program. DOE also established the Defense Production Act (DPA) Consortium and will seek voluntary agreements with U.S. companies across the nuclear supply chain. Under the DPA Consortium, voluntary agreements will allow industry consultation to develop plans of action to ensure that the nuclear fuel supply chain capacity for mining, milling, and conversion. Further, DOE announced $11 million in awards to five U.S. companies to develop and license new or modified transportation packages for high-assay low-enriched uranium.

Establishing a domestic uranium enrichment capacity. Finally, in January 2026, DOE awarded $2.7 billion collectively to American Centrifuge Operating ($900 million), General Matter ($900 million) and Orano Federal Services ($900 million) to strengthen domestic enrichment services over the next ten years. DOE also awarded an additional $28 million to Global Laser Enrichment to continue advancing next generation uranium enrichment technology for the nuclear fuel cycle. These awards support President Trump's commitment to enhance energy security, reduce reliance on foreign suppliers, expand U.S. capacity for low-enriched uranium and jumpstarts new supply chains and innovations for high-assay low-enriched uranium to create American jobs and usher in the nation's nuclear renaissance. These initiatives, coupled with the Administration's efforts to end America's reliance on foreign sources of enriched uranium, are essential to ensuring American leadership in nuclear energy and to meeting the nation's growing demand for reliable power and achieve a true nuclear energy renaissance.

Facilitating Small Modular Reactor Deployment. On December 2, 2025, DOE announced the selection of Tennessee Valley Authority and Holtec Government Services to collectively receive $800 million in Federal cost-shared funding to accelerate deployments of advanced light-water SMRs in the United States. These projects will help deliver new nuclear generation in the early 2030s, strengthen domestic supply chains, and unlock fleet-mode deployment of Generation III+ SMRs. For Generation IV SMRs, the major recipients of DOE's Advanced Reactor Demonstration Program have demonstrated both technical, regulatory, and supply chain milestones to support widescale deployment of these next generation nuclear reactors. On May 12, 2025, the NRC formally accepted the construction permit application for X-energy's SMR to be deployed in Texas, and on December 1, 2025, the NRC completed its final safety evaluation for TerraPower's SMR, finding no safety aspects that would preclude issuing the construction permit. Finally, Kairos Power started nuclear construction on the first-Generation IV reactor in the United States.

DOE's Regional Energy Training Centers Help Advance Commercial Deals for U.S. Industry. DOE launched the Regional Energy Training Center (RETC) model in Ghana and Poland to build national and regional nuclear energy workforce capacity that deliver U.S-standard leadership and technical and vocational training, directly linking skilled professionals with U.S. industry and institutional partners. By strengthening human capital and regulatory frameworks, the RETCs create durable commercial pathways for U.S. companies (e.g., through agreements to deploy NuScale technology in Ghana) to compete for contracts, technology deployment, and long-term support in emerging nuclear markets. DOE's engagement in Poland through the RETC has advanced the Westinghouse/Bechtel commercial contract that is being negotiated in 2025 (valued at over $25 billion) as well as GE-Hitachi led SMR deployment plans there.

Nuclear Power Applications

Designating Federal Lands for Nuclear Energy and AI Infrastructure. Between September 8 and October 31, 2025, DOE issued four Requests for Applications (RFAs) to seek proposals from U.S. companies to build and power AI data centers with nuclear or other energy generation at Idaho National Laboratory, Oak Ridge Reservation, Paducah Gaseous Diffusion Plant, and Savannah River Site. This action fulfills part of President Trump's Executive Order on "Deploying Advanced Nuclear Reactor Technologies for National Security," which directs the Secretary of Energy to designate one or more sites owned or controlled by DOE within the

United States, including national laboratories, for the use and deployment of advanced nuclear reactor technologies. In response to the RFAs, DOE received strong proposals from a diverse set of applicants that will promote American leadership in AI and leverage Federal land assets to quickly deploy cutting-edge data centers and energy generation projects.

Revitalizing the Nuclear Sector for National Security Applications. On May 23, 2025, President Trump issued an Executive Order on "Deploying Advanced Nuclear Reactor Technologies for National Security" which directs DoW to establish a program of record for the utilization of nuclear energy for both installation energy and operational energy, with the goal of having an operational nuclear reactor at a domestic military base or installation by 2028. DoW, DOE, and other interagency partners are working together on technical evaluation, authorizing, testing, fueling, operation, and disposition of both fixed-site and transportable microreactors in support of national security applications. Agencies are also working together on the Army's JANUS program, launched on October 14, 2025, to deliver resilient, secure, and assured energy to support national defense installations and critical missions. And on December 23, 2025, the Department of Homeland Security issued a request for proposals for development, testing, and deployment of mobile and transportable microreactors that will enable emergency power restoration at fixed sites and for local and regional power grids.

National Initiative for American Space Nuclear Power. On December 18, 2025, President Trump signed an Executive Order on "Ensuring American Space Superiority," establishing a U.S. space policy that calls for the development of enabling technologies—including space nuclear power—to secure the nation's vital economic and security interests, unleash commercial development, and lay the foundation for a new space age. The Order directs efforts to enable near-term utilization of space nuclear power by deploying nuclear reactors on the Moon and in orbit, including a lunar surface reactor ready for launch by 2030, to be coordinated through a National Initiative for American Space Nuclear Power. These efforts build on a NASA "Directive on Fission Surface Power (FSP) Development," issued on August 4, 2025, which initiated a NASA effort to develop a nuclear reactor to be ready for launch to the Moon by 2030. On December 5, 2025, NASA issued its second draft announcement for partnership proposals for development of the fission surface power system.

Establishing Commercial Maritime Nuclear Propulsion. On September 18, 2025, the Government of the United States of America and the Government of the United Kingdom of Great Britain and Northern Ireland signed a Memorandum of Understanding on the Technology Prosperity Deal that enables collaboration towards joint opportunities of mutual interest in strategic science and technology disciplines, including civil nuclear energy technologies. This includes joint exploration of novel applications of advanced nuclear energy, including civil maritime applications, to establish a maritime shipping corridor between the territories of the United States and the UK. This civil maritime nuclear cooperation includes developing shared objectives, identifying policy, regulatory, and other barriers to adoption, and exploring opportunities for industry-led establishment of a nuclear maritime shipping corridor between our two countries.

Nuclear Fusion

National Strategy to Accelerate the Development and Commercialization of Fusion Energy. October 16, 2025, DOE released its Fusion Science and Technology Roadmap, a national strategy to accelerate the development and commercialization of fusion energy on

the most rapid, responsible timeline in history. The roadmap defines DOE's "Build–Innovate–Grow" strategy to align public investment and private innovation to deliver commercial fusion power to the grid by the mid-2030s. This effort advances President Trump's Executive Order on "Unleashing American Energy," reinforcing the Administration's commitment to expand domestic energy production and restore U.S. energy dominance. By accelerating progress toward commercial fusion power, DOE is strengthening America's grid, rebuilding critical supply chains, and securing a new era of abundant, reliable, American-made energy.

The First Interactive, AI-Enabled Digital Twin of a Fusion Facility. On October 28, 2025, NVIDIA and General Atomics announced the world's first high-fidelity, AI-enabled digital twin of a fusion facility with interactive performance, developed for the DIII-D National Fusion Facility, a DOE Office of Science user facility. This groundbreaking project uses NVIDIA's accelerated computing and AI platforms and General Atomics' high-fidelity plasma physics models to help researchers tackle one of science's toughest problems: making fusion energy work on Earth. This interactive framework allows scientists to visualize reactor performance, adjust operating parameters, and explore control strategies dynamically, marking a major step toward intelligent, data-driven fusion research and the advancement of fusion energy solutions. Traditionally, simulating plasma behavior takes weeks on even the fastest supercomputers. The system integrates General Atomics' high-fidelity plasma physics models to simulate and predict plasma behavior in real time using AI surrogate models trained on decades of real-world data. By moving from weeks-long simulations to near-real-time, interactive answers in seconds, the digital twin acts as a true "fusion accelerator"—a platform to rapidly test new ideas, optimize reactor designs and put commercial fusion energy on a faster track.

Launch of the Fusion Innovation Research Engine (FIRE) Collaboratives. In 2025, DOE announced awards totaling $235M to establish thirteen FIRE Collaboratives to create a fusion energy science and technology innovation ecosystem. These large, virtual, but centrally managed teams called "Collaboratives" have a collective goal of bridging fusion science research programs to the growing fusion industries. The collaboratives include an accelerated alloy design and scale-up to establish the first mature structural alloys for fusion power plants—leading the world with U.S. supply chains and materials; and advancing technologies needed for fusion fuels using some of the only fusion neutron prototypic environments in the world at the U.S. company SHINE Medical and University of Wisconsin, Madison. This initiative represents a significant step forward in FES's commitment to advancing fusion energy R&D and aims to create new economic opportunities, maintain US leadership in fusion, support U.S.-based manufacturing and supply chains, and enable the development of technologies crucial for national security, energy security, and defense.

Facility for Laboratory Reconnection Experiments (FLARE) Begins Operations. DOE's state-of-the-art FLARE collaborative research facility began its initial operations in 2025. Princeton Plasma Physics Laboratory's FLARE Team made excellent progress in establishing reliable operational and diagnostic capabilities of this new facility. Currently, the Team is working toward obtaining high-impact results on multiple X-line kinetic reconnection which occurs in most of the space and laboratory fusion plasmas. FLARE will advance discovery in magnetic reconnection, a plasma process commonly found in both fusion and astrophysics, in which magnetic energy is transformed into kinetic energy and heating. During magnetic reconnection, the rapid release of magnetic energy (such as, solar flare, geomagnetic storm,

and disruption) through topological rearrangement of magnetic field lines can cause damages to satellites, power grids, and fusion devices.

Significant Progress in Milestone-Based Fusion Development Program. The Milestone program is a public-private partnership, where companies work with private funds to achieve scientific, technical, commercial, and design milestones. The original eight teams raised over $1.2 billion since the initial $46 million DOE investment. Milestone reports are reviewed by DOE and by expert external reviewers from U.S. National Laboratories and universities. Teams receive a Federal payment only upon successful completion of a milestone. In 2025, fusion company Commonwealth Fusion Systems (CFS) completed its toroidal field coil milestone. This milestone validated that the D-shaped high-temperature superconducting magnets the company designed, manufactured, and tested can realize the performance targets needed to deliver the magnetic fields required to achieve the world's first magnetically confined fusion gain plasma. This achievement builds confidence in the CFS approach by de-risking this key technology. CFS announced a $863 million series B2 round in August 2025. Also in 2025, fusion company Thea Energy completed the milestone on its Helios fusion pilot plant preconceptual design. This design for a two-field-period quasi-axisymmetric stellarator passed a rigorous design review with experts from national labs and universities. Helios will have 12 large high-temperature superconducting magnets on the outside to help confine the plasma, along with over 300 smaller circular magnets to fine-tune the plasma confinement.

Biotechnology & Health

"We will make America healthy again."

– President Donald J. Trump, April 29, 2025

The United States stands at the threshold of a profound transformation driven by the convergence of biotechnology and AI. At the center of the Trump Administration's approach is Make America Healthy Again (MAHA): on February 13, 2025, President Trump signed Executive Order 14212 establishing the MAHA Commission, charged with investigating the root causes of America's escalating chronic disease crisis—with an initial focus on childhood illness. On May 22, the Commission released its groundbreaking "Make Our Children Healthy Again" Assessment identifying key factors behind the childhood chronic disease epidemic. The Commission's work reflects the Administration's unifying objective to cure chronic diseases, improve health outcomes for all Americans, and secure U.S. leadership in the critical domain of biotechnology and health.

Biotechnology is both a driver of medical progress and a strategic national capability. President Trump's vision to dominate in emerging technologies—as articulated in policies on Gold Standard Science and the Genesis Mission—will unleash American innovation and build the U.S. "biotech stack" to ensure dominance across industries from drug discovery to biomanufacturing. The Genesis Mission marshals AI and the national laboratories to accelerate breakthroughs in biotechnology, critical materials, and other priority domains. At the same time, the Administration has emphasized the need to advance biological discovery within clear guardrails to protect public safety and national security.

Across agencies, the Administration has moved to integrate new technologies such as AI into scientific workflows, regulatory evaluation, and health system operations. HHS has led on the adoption of advanced analytics across research programs and regulatory science, supporting real-world applications including AI-enabled pediatric cancer research and broader use of integrated data to understand disease progression and treatment performance. Regulatory science at the FDA has also evolved to accommodate emerging technologies—including AI-supported evidence and real-world data—while maintaining rigorous standards. Meanwhile, parallel efforts to reduce reliance on animal testing, modernize research methods, rebuild domestic manufacturing capacity, and encourage private sector investment in U.S.-based biotechnology reflect a broader strategy to ensure that innovation strengthens health resilience and delivers tangible benefits for the American people.

Highlights

Biological Discovery

Deploying AI-Driven Biotechnology Research Infrastructure. The DOE launched a breakthrough AI-driven biotechnology platform designed to accelerate autonomous biological discovery, particularly in microbial science and the bioeconomy. As part of this

effort, DOE commissioned the Anaerobic Microbial Phenotyping platform, as a public-private partnership with industry collaborators, a first-of-its-kind capability that integrates AI-guided software with autonomous experimental hardware to generate biological data at unprecedented speed and scale. This platform will enable laboratory scientists to identify and characterize microbes more rapidly than traditional methods, supporting advances in biotechnology and basic biological research while strengthening U.S. leadership in AI-driven scientific innovation.

Advancing Critical Research to Drive Health Innovation. Under Secretary Kennedy's leadership, in February 2025, HHS provided key recommendations to President Trump that will allow the U.S. to pursue rigorous, Gold Standard scientific research to help ensure informed decisions that promote healthy outcomes for American children and families, as well as drive innovative solutions. Under this effort, NIH is launching a new Whole-Person-Health approach to chronic disease prevention research and leverage collective expertise across the agency to catalyze transformative discovery science and intervention strategies that promote wellness, resilience, and optimal health, including metabolic health, at all stages of life.

Safeguarding the U.S. and the World from Dangerous Gain-of-Function Research. On May 5, 2025 President Trump signed Executive Order 14292 "Improving the Safety and Security of Biological Research" to launch a review of Federal funding for life sciences research to stop dangerous research and implement common sense policies for its governance. This prohibits Federal funding from contributing to foreign research likely to cause another pandemic. These measures will drastically reduce the potential for lab-related incidents

President Donald Trump Signs an Executive Order to Accelerate Pediatric Cancer Research (September 30, 2025)

involving gain-of-function research, like that conducted on bat coronaviruses in China by the EcoHealth Alliance and the Wuhan Institute of Virology.

AI & Digital Health

Revolutionizing Clinical Research and Health Services. On December 4, 2025, HHS released its AI Strategy, outlining a plan to leverage AI to drive American innovation, improve patient outcomes, and Make America Healthy Again. Key pillars of the department's AI strategy include improving efficiency through workforce development and burden reduction, strengthening health research and reproducibility through Gold Standard Science, and modernizing public health delivery for better outcomes. Bolstered by the department's forward-looking approach on AI, in May 2025, the FDA announced the completion of a pilot for AI-assisted scientific reviews, which enabled FDA scientists and subject-matter experts to spend less time on tedious, repetitive tasks and reduced multi-day scientific reviews to just minutes. In December 2025, the FDA qualified its first AI drug development tool, the AI-Based Histologic Measurement of NASH (AIM-NASH), which helps pathologists analyze liver biopsy images, standardize assessment during clinical trials, and reduce the time needed for metabolic dysfunction-associated steatohepatitis drug development.

Unlocking Cures for Pediatric Cancer. On September 30, 2025, President Trump signed Executive Order 14355 "Unlocking Cures for Pediatric Cancer with Artificial Intelligence," which will harness American AI innovation to unlock cures an prevention strategies for pediatric cancer. HHS will double funding for the Childhood Cancer Data Initiative (CCDI) at the National Cancer Institute, which President Trump launched in 2019, to $100 million per year to collect, generate, and analyze childhood cancer data. The funding surge is designed to accelerate the development of improved diagnostics, treatments, and prevention strategies. HHS will use artificial intelligence to maximize the potential for electronic health record and claims data to inform research and clinical trial design. With America's frontier AI models, American researchers now have the best tools in the world to turn the CCDI data ecosystem into improved diagnoses, treatments, cures, and prevention strategies.

Providing Regulatory Clarity for AI-Enabled Clinical Decision Support. In January 2026, the FDA issued updated guidance on clinical decision support (CDS) software that clarifies how software functions are assessed under federal law and when they are regulated as medical devices. The update refines the interpretation of statutory exclusions for certain CDS functions, emphasizing that software my fall outside device regulation when health care professionals can independently review and understand the basis for its recommendations. This clarification is particularly relevant for AI-enabled tools, reinforcing a risk-based approach that supports innovation in advanced analytics and machine learning while maintaining oversight for software that directly influences clinical decision making and patient care.

Expanding Access to Chronic Disease Technologies with Digital Health. The FDA launched the Technology-Enabled Meaningful Patient Outcomes (TEMPO) for Digital Health Devices Pilot, a first-of-its-kind, voluntary initiative to promote safe access to innovative digital health technologies aimed at improving outcomes for chronic conditions. TEMPO will provide a risk-based enforcement approach allowing certain digital health devices to be used in care settings while manufacturers collect and share real-world performance data under FDA oversight. The pilot seeks to accelerate real-world use and evidence generation for digital tools across

multiple health domains, potentially informing future regulatory decisions and expanding patient access to advanced care technologies.

Health & Pharmaceutical Innovations

Streamlining Regulations for Quicker Drug Approvals. The FDA launched its FDA Commissioner's National Priority Voucher pilot program, which aims to cut proposal review timelines from 10–12 months down to 2 months. The program also removed a key limitation on the use of real-world evidence used in drug and device applications reviews. In new guidance for certain types of medical device submissions, the agency will accept real-world evidence without requiring that identifiable individual patient data collected from real-world data sources always be submitted in a marketing submission. This common-sense reform will unlock access to vast databases like cancer and cystic fibrosis registries that contain critical insights about how treatments work in the real world.

Approving Novel and Innovative Drugs and Treatments. In Year One of the Trump Administration, developers secured approvals for 46 new therapeutic agents from the FDA's Center for Drug Evaluation and Research (CDER), nearly 30% above the historic average. These novel drug therapies are approved to treat issues such as acute myeloid leukemia, advanced and metastatic lung cancers, and hypertrophic cardiomyopathy, promising better outcomes from Americans suffering from life-threatening diseases and illnesses.

Bringing Back Domestic Drug Manufacturing. On May 8, 2025 President Trump signed an executive order to foster domestic drug manufacturing. Domestic manufacturing of essential medicines is a national security issue and will unleash prosperity for American workers. As a result of President Trump's efforts, many companies are already onshoring and investing in America, including over $150B in investment commitments across manufacturing and pharmaceutical research and development. In addition, a number of companies have agreed to donate active pharmaceutical ingredients for key products to the Strategic Active Pharmaceutical Ingredients Reserve to reduce reliance on foreign nations and ensure an adequate supply of in the event of an emergency.

Reducing Animal Use in Research. On April 29, 2025, the NIH announced that it was adopting a new initiative to expand human-based research while reducing testing in animals. All new NIH funding opportunities relating to animal model systems will now also support human-focused approaches, such as clinical trials, real world data, and new approach methods. To support these efforts, NIH is proposing the establishment of a new Office of Research Innovation, Validation, and Application. The Environmental Protection Agency (EPA), Food and Drug Administration (FDA), and NIH have all committed to the expanded use of New Approach Methodologies (NAMs) to enable earlier, more predictive insights into chronic disease mechanisms using human-relevant models such as organoids, computational simulations, and real-world data integration. This improves prevention, diagnosis, and personalized treatment strategies while reducing reliance on animal studies that often fail to replicate complex human conditions.

Expanding Nutrition Regulatory Science. The FDA and NIH jointly launched the Nutrition Regulatory Science Program, establishing a coordinated Federal research agenda to generate evidence that can directly inform U.S. food and nutrition policy. Under this collaboration, FDA is contributing its regulatory science expertise while NIH is providing the infrastructure for soliciting, reviewing, and overseeing scientific research. The initiative will bring together

multidisciplinary scientific teams to investigate foundational questions about nutrition and health, such as impacts of ultra-processed foods on health and metabolic impacts of certain food additives, with the goal of strengthening the scientific basis for effective regulatory actions and dietary guidance. Furthermore, NIH, working with the FDA, USDA, and the Administration for a Healthy America, is conducting high quality nutrition research and ingredient assessments.

Advanced Transportation

"The success of advanced air mobility will further strengthen American leadership in the technologies defining the next generation of transportation."

– Director Michael Kratsios, December 17, 2025

The Trump Administration views aviation as a cornerstone of America's economic strength, national security, and technological leadership. In 2025, it pursued an ambitious agenda to restore U.S. dominance in the skies—modernizing outdated infrastructure, embracing new technologies, and clearing away old regulatory obstacles. Key initiatives focused on safely integrating drones and electric vertical takeoff and landing aircraft (often called flying taxis) into the national airspace, reviving American leadership in supersonic flight, rolling out advanced digital and AI-powered safety systems, and replacing decades-old rules with flexible, innovation-friendly frameworks. These efforts have kept America's skies the safest in the world while boosting economic growth, improving mobility, strengthening emergency response, and delivering real-world benefits to everyday Americans.

President Trump also prioritized modernizing surface transportation, recognizing its vital role in the economy, industry, and road safety. In Year One, the Administration advanced an America First strategy that updated vehicle safety standards written for an earlier era, accelerated the responsible rollout of automated driving technologies, supported the trucking industry that powers the nation's supply chains, and used data-driven approaches to target the greatest risks on the roads. By providing clear regulatory guidance, maintaining strong safety oversight, and investing in breakthrough crash-prevention research, the Administration has worked to ensure that American manufacturers, drivers, and workers lead the world in the next era of transportation—delivering safer roads and more efficiently connecting families and businesses across the country.

President Trump's 2025 aviation and surface transportation achievements build directly on the strong foundation he established during his first term. In aviation, he launched the Unmanned Aircraft Systems Integration Pilot Program (later expanded into BEYOND), breaking regulatory gridlock to enable real-world drone testing with government, local, and industry partners, shifting the FAA toward flexible, risk-based rules that opened commercial drone applications in inspection, agriculture, public safety, and delivery. His first Administration also began modernizing air traffic control, advancing policies for commercial space and supersonic flight, and prioritizing performance-based regulation over rigid restrictions, creating a lasting framework that moved U.S. aviation toward safer, innovation-driven progress. Similarly, in surface transportation, the Administration released the Automated Vehicles 3.0 and 4.0 frameworks to provide a unified Federal vision for safe automated vehicle development and testing while preventing a patchwork of state rules. It also updated fuel economy and emissions standards, streamlined approvals for innovative designs,

OSTP Director Michael Kratsios delivering remarks at Advanced Air Mobility event at the Department of Transportation. (December 17, 2025)

and strengthened Federal research—ensuring that America, not foreign competitors, would lead the next generation of both flight and ground transportation.

Highlights

Unmanned Aircraft Systems

Advancing National UAS Leadership. On June 6, 2025, President Trump signed Executive Order 14307, "Unleashing American Drone Dominance," establishing a whole-of-government policy to accelerate U.S. leadership in autonomous aviation, expand commercial UAS operations, and strengthen American competitiveness in advanced air mobility. Drones are already transforming industries from logistics and infrastructure inspection to precision agriculture, emergency response, and border security. This Order advances three key policy objectives: accelerating safe integration of UAS into the National Airspace System, advancing domestic commercialization of drone technologies at scale, and strengthening the domestic drone industrial base while promoting exports of trusted, American-manufactured UAS to global markets.

Modernizing Low-Altitude UAS Operations. On August 7, 2025, as directed in the Executive Order on "Drone Dominance," the Federal Aviation Administration published the "Normalizing

Unmanned Aircraft Systems Beyond Visual Line of Sight Operations" Notice of Proposed Rulemaking, initiating the first performance-based regulatory framework for routine BVLOS missions across agriculture, inspection, delivery, emergency response, and other sectors. Eliminating burdensome requirements for BVLOS operations will significantly unlock the low-altitude UAS economy.

Accelerating UAS Approvals Through AI. In early October 2025, as directed in the Executive Order on "Unleashing American Drone Dominance," the FAA completed its transition to new Part 107 waiver-processing software incorporating artificial intelligence tools, enabling faster, more consistent risk-based evaluations and significantly reducing review times for operators nationwide. The AI tools support performance and risk-based evaluation of proposed operations, identify materially similar precedents to recommend consistent mitigation measures, and flag categories of operations with sufficient safety data or recurring approval patterns that may warrant rulemaking.

Surging American Drones at the Department of War. On July 10, 2025, pursuant to the Executive Order on "Unleashing American Drone Dominance," Secretary Hegseth issued a memo to expedite the Department's efforts to equip the military with the most up to date drone technology. The memo rescinds restrictive policies that hindered production and access, delegates authorities to procure and operate drones to the warfighter, and will bolster U.S. drone manufacturing by approving hundreds of American products for purchase by the Department of War. The memo demands for a new drone procurement strategy and to integrate these technologies in relevant combat training.

Strengthening America's Drone Security. On July 16, 2025, the Department of Commerce initiated a Section 232 national security investigation into imports of UAS, parts, and components, as directed by the Executive Order on "Unleashing American Drone Dominance." This review reflects a strong national commitment to safeguarding innovation and advancing a secure UAS ecosystem.

Igniting American Aviation Innovation Through a National Center of Excellence. On April 23, 2025, Transportation Secretary Sean P. Duffy, working alongside President Trump's allies in Congress, including Senator Ted Cruz, announced that the Texas A&M University System (TAMUS) will lead the Federal Aviation Administration's new Center for Advanced Aviation Technologies (CAAT). The center is designed to push the frontiers of aviation science and technology while ensuring safe, seamless integration of advanced aircraft into the National Airspace System. By bringing together government, academia, and industry, this effort creates a powerful engine for innovation that keeps the United States ahead of global competitors. Building on a North Texas test site, where companies are already conducting commercial drone deliveries and public safety operations using advanced UAS Traffic Management (UTM) technology, the center positions America to lead the world in next generation aviation systems, safety, and operational scale.

Unleashing Cutting-Edge Drone Detection to Defend America's Airspace. Under President Trump's leadership, the Federal Aviation Administration is aggressively testing advanced drone-detection technologies to strengthen security and situational awareness across U.S. airspace. Between April 14 and April 25, the FAA conducted intensive testing in Cape May, New Jersey, led by the agency's Center of Excellence for UAS Research (ASSURE) in partnership with the Delaware River Bay Authority Police and local first responders. The effort involved operating several large drones and more than 100 commercial-off-the-shelf drones to rigorously evaluate detection capabilities. Building on years of airport testing, the FAA is

expanding these efforts beyond airport boundaries to determine system effectiveness and ensure new technologies do not interfere with aircraft or navigation systems. Following initial off airport testing in Alaska, additional tests are planned in New Mexico, North Dakota, and Mississippi, demonstrating a full throttle commitment to using science, technology, and American innovation to protect the nation's skies.

Advanced Air Mobility

Launching America's Electric Vertical Takeoff and Landing (eVTOL) Revolution. On September 16, 2025, as required by the Executive Order on "Unleashing American Drone Dominance," the establishment of the eVTOL and Advanced Air Mobility (AAM) Integration Pilot Program (eIPP) and request for proposals, inviting state, local, tribal, and territorial governments, in partnership with a private sector partner, to compete for participation in the next generation of America's advanced aviation testbeds. Building on the success of President Trump's successful UAS integration pilot program, eIPP is designed to accelerate domestic innovation, strengthen U.S. technological leadership, and drive real-world deployment of cutting-edge flight capabilities. Through this program, the United States is poised to unlock a new wave of high-impact operations like air taxis that will keep America at the forefront of global aerospace innovation.

Setting a Bold, Decade-Long Course for American Leadership in Advanced Air Mobility. On December 17, 2025, under President Trump's leadership, the Department of Transportation released a National Strategy for Advanced Air Mobility it charts a clear path for integrating next generation aviation technologies into the national airspace while reinforcing US leadership in the global marketplace. Developed through the coordinated efforts of more than 20 Federal agencies and led by dot, the strategy and its accompanying comprehensive plan layout a concrete road map for the next decade, aligning policy, technology, and operations to move AAM from vision to reality. This whole of government effort reflects President Trump's drive to ensure America sets the pace in advanced aviation, translating innovation into safe, scalable operations that benefit the nation's economy, mobility, and global competitiveness.

Supersonic Flight

Restoring American Supersonic Leadership. For decades, overly restrictive regulations grounded the promise of supersonic flight over land, stifling American ingenuity and ceding leadership to foreign nations. On June 6, 2025, President Trump signed the Executive Order on "Leading the World in Supersonic Flight," launching a national effort to revitalize U.S. high-speed aviation, remove outdated regulatory barriers, and reestablish American primacy in supersonic aircraft development. The Order directs the FAA to repeal the prohibition on overland supersonic flight, establish interim noise-based certification standards, and coordinate Federal R&D through the National Science and Technology Council. With advances in aerospace engineering and noise reduction making supersonic flight safe and commercially viable, American companies are leading the way to bring the next generation of high-speed air travel to market.

American Testing to Lead the Supersonic Future. On October 28, 2025, NASA's X-59 quiet supersonic research aircraft completed its historic first flight, beginning the next phase of flight testing for the Quesst mission, as directed by the Executive Order on "Leading the World in Supersonic Flight." This milestone marks a breakthrough in U.S. aerospace innovation: a

purpose-built, piloted X-plane engineered to prove that supersonic flight over land can be made quiet enough for real-world use. With the X-59 now airborne, America is reasserting its leadership in high-speed aviation and laying the groundwork for a future where air travel can be faster, efficient, and community-friendly.

Autonomous Vehicles

Unleashing American Ingenuity While Setting the Gold Standard for Automated Vehicle Safety. On April 24, under President Trump's leadership, the Department of Transportation unveiled the National Highway Traffic Safety administration's new automated vehicle framework as part of Secretary Duffy's transportation innovation agenda. The framework is designed to unleash American ingenuity, uphold critical safety standards, and prevent a fragmented patchwork of state regulations that would slow progress and undermine national leadership. It is built on three clear principles, prioritizing the safety of ongoing automated vehicle operations, removing unnecessary regulatory barriers to innovation, and enabling commercial deployment to enhance safety and mobility. Actions under the framework include expanding the automated vehicle exemption program to include domestically produced vehicles and streamlining crash reporting requirements for vehicles equipped with advanced driver assistance and automated driving systems, accelerating safe deployment while keeping America firmly in the driver's seat of automotive innovation.

Putting American-Built Automated Vehicles First and Clearing the Road for U.S. Innovation. On August 6, 2025, the Department of Transportation announced that the National Highway Traffic Safety Administration issued an exemption for Zoox driverless vehicles, the first granted under the newly expanded automated vehicle exemption program. This marks the first ever exemption for American built vehicles under the program, following NHTSA's April decision to expand eligibility to domestically produced vehicles as part of its automated vehicle framework. Previously, only foreign built automated vehicles qualified, placing American innovators at a disadvantage. This action reflects President Trump's insistence that U.S. policy backs American manufacturing and ingenuity, removing barriers so American companies can lead the world in automated vehicle technology while meeting safety requirements.

Fast-Tracking Safe Automated Vehicles Through Smarter, Technology-Driven Regulation. On June 13, 2025, Transportation Secretary Sean Duffy announced that the National Highway Traffic Safety Administration will further accelerate the safe development of automated vehicles by streamlining the Part 555 exemption process, delivering on President Trump's push for speed, innovation, and commonsense rules. The exemption allows manufacturers to sell up to 2,500 vehicles per year that do not fully comply with traditional Federal Motor Vehicle Safety Standards, including vehicles without steering wheels, driver operated brakes, or rear-view mirrors, provided they demonstrate an equivalent level of safety and that the exemption serves the public interest. This action builds on Secretary Duffy's innovation agenda and NHTSA's Automated Vehicle framework, clearing unnecessary procedural friction so advanced vehicle technologies can move faster from testing to real-world use safely, responsibly, and at scale. NHTSA also issued a letter to stakeholders about these improvements.

Updating Vehicle Safety Standards to Support Safe Deployment of Automated Driving Systems in the United States. On September 4, 2025, Under President Trump's leadership,

the Department of Transportation announced that the National Highway Traffic Safety Administration (NHTSA) is launching three rulemakings to update Federal Motor Vehicle Safety Standards (FMVSS) that were written decades ago and do not account for vehicles equipped with automated driving systems. Through the Federal Spring Unified Agenda of Regulatory and Deregulatory Actions, NHTSA is proposing amendments to FMVSS numbers 102 (Transmission shift position sequence, starter interlock and transmission braking effect), 103 (Windshield defrosting and defogging systems), 104 (Windshield wiping and washing systems), and 108 (Lamps, reflective devices, and associated equipment) to address safety standards for automated vehicles with no manual controls. These actions advance safety, provide regulatory clarity, and help ensure that Americans benefit from the safe introduction of automated vehicle technologies on U.S. roads.

Transportation Safety

Delivering a Brand-New Air Traffic Control System to Secure America's Skies for the Future. Under President Trump's leadership, the Department of Transportation and the Federal Aviation Administration took a major step toward the most significant aviation infrastructure modernization in decades by selecting a Prime Integrator to lead development of a new national air traffic control system. This effort will replace aging, fragmented systems with a modern, resilient architecture designed to improve safety, increase efficiency, and strengthen America's aviation leadership. To meet the ambitious goal of implementation by the end of 2028, DOT and FAA deployed an innovative first-of-its-kind Federal procurement approach to accelerate integration and execution, demonstrating the Trump Administration's commitment to decisive action, smart reform, and keeping the United States at the forefront of global aviation.

Modernizing Hazardous Materials Oversight Through Data-Driven Enforcement and Smarter Regulation. Under President Trump's leadership, the Pipeline and Hazardous Materials Safety Administration launched a first-of-its-kind data-driven framework to transform how hazardous materials are regulated across America's transportation network. By directing inspectors to focus on the highest-risk entities, such as lithium battery shippers, undeclared hazardous materials in e-commerce, and repeat violators, the framework strengthens safety, improves compliance, and prevents accidents before they occur. This approach modernizes outreach, inspection, and enforcement while accelerating case resolution and improving national consistency, aligning hazmat oversight with the Trump Administration's broader push for smarter, more effective regulation that protects the public while keeping American commerce moving.

Advancing Vehicle Safety Through Breakthrough Crash Testing. Under President Trump's leadership, the Department of Transportation unveiled the design of the first-of-its-kind, advanced female crash test dummy, marking a major step forward in protecting Americans on the road. The THOR-05F, an initiative launched during the first Trump Administration, addresses longstanding safety gaps by better reflecting real-world crash dynamics and injury risks. Equipped with more than 150 state-of-the-art sensors, the dummy delivers unprecedented accuracy and durability, capturing three times more injury data than existing models. With the technical foundation complete, the THOR-05F will be available for dummy manufacturers to build models to meet these specifications, enabling U.S. manufacturers and automakers to deploy this innovation in vehicle testing, strengthening safety standards while reinforcing American leadership in automotive research and engineering.

Modernizing Critical Aviation Safety Systems to Protect America's Skies and the Traveling Public. Under President Trump's leadership, the Department of Transportation announced that the Federal Aviation Administration deployed the first phase of a brand new Notice to Airmen (NOTAM) system months ahead of schedule, marking a major milestone in modernizing America's air traffic control infrastructure. The new NOTAM Management Service replaces a system dating back to 1985 that experienced multiple outages, including a nationwide failure in 2023. Built as a cloud-based, resilient, and user-friendly platform, the modernized system delivers near real time safety alerts that improve reliability and efficiency across US airspace for pilots, airlines, and passengers. The FAA remains on track to complete the full transition to a single source modem service by late spring 2026, strengthening safety for the American traveling public.

Ensuring Compliance with Safety Requirements to Keep America's Trucking Industry Moving. Under President Trump's leadership, on July 31, 2025, the Department of Transportation's Federal Motor Carrier Safety Administration took action to uphold Federal technology standards by removing two devices from the agency's list of registered electronic logging devices (ELDs) to ensure continued compliance with Federal safety requirements. Motor carriers were provided up to 60 days to replace the revoked devices with compliant ELDs, maintaining clear standards while allowing time for an orderly transition period. This action reinforces safety on America's highways while supporting the reliable movement of goods American families and businesses depend on every day.

Expanding Safety, Innovation, and Access in Recreational and Light Aviation. On July 24, 2025, the Federal Aviation Administration published a final rule making significant updates to the light sport aircraft category and sport pilot privileges, expanding a safe and regulated alternative to experimental amateur built aircraft. The rule removes outdated weight limits to allow additional safety features and greater design flexibility, broadens eligibility to aircraft with higher speeds, more seats, and retractable landing gear, and enables the use of new propulsion technologies and modern avionics it also permits certain aerial work using light support aircraft, such as infrastructure and forest inspections, photography and filming, and agricultural surveillance, while allowing sport pilots to operate a wider range of aircraft. Together, these changes reduce unnecessary regulatory constraints while strengthening safety and enabling Americans to benefit from advances in aviation technology.

Strengthening Critical Aviation Infrastructure to Improve Reliability at One of America's Busiest Airports. On July 3 2025, under President Trump's leadership, the Department of Transportation announced that the Federal Aviation Administration completed a key operational milestone at Newark Liberty International Airport by transitioning to a brand-new fiber-optic communications network linking New York and the Philadelphia Terminal Radar Approach Control facility. This upgrade significantly improves the reliability of operations by introducing two separate fiber optic communication paths, ensuring continuity if one path is disrupted. With the fiber installed in June and successfully tested over the following month, this milestone reinforces of systems that guide aircraft into and out of Newark, strengthening the safety and reliability of air travel for millions of Americans who depend on this vital gateway every year.

Unleashing Transparent, Data-Driven Rail Safety Through Next-Generation Technology. On June 11 2025, under President Trump's leadership, the Federal Railroad Administration completed the transition to a new, modern safety data website designed to put powerful rail safety information directly into the hands of the public. The upgraded platform delivers a more

user friendly, technology-forward experience that increases transparency and gives users greater flexibility to query and analyze rail safety data. By modernizing how safety data is accessed and used, this effort strengthens oversight, supports smarter decision making, and reinforces America's commitment to using cutting edge technology to keep the nation's rail system safe and reliable.

Calling on World-Class Innovators to Build the Future of America's Air Traffic Control System. On June 10, 2025, under President Trump's leadership, the Department of Transportation launched the Federal Aviation Administration's first ever Industry Day events to bring together America's top companies to help design and deliver a brand new, state-of-the-art air traffic control system. Following the FAA's June 3 Request for Information, these industry days, held June 10-12, invite industry leaders to engage directly with the Federal government on how best to implement next generation technologies at national scale. The effort seeks an integrator to manage acquisition and deployment of new capabilities, marking a decisive step harnessing American innovation, engineering excellence, and technological leadership to secure and strengthen the National Airspace System.

Driving a Bold, Data-Driven Push to Save Lives on America's Roads. On May 6, 2025, under President Trump's leadership, the National Highway Traffic Safety Administration (NHTSA) brought a clear, results-focused message to the Road to Zero annual meeting on how to dramatically reduce traffic fatalities nationwide. NHTSA leadership emphasized the critical role of enforcement, cracking down on excessive speeding, combating impaired driving, and using data to target the most dangerous behaviors. The discussion also highlighted advances in post-crash care, including prehospital blood transfusion for crash systems, underscoring a science and evidence-based approach to saving American lives. This effort reflects a no-nonsense commitment to using data, enforcement, and medical innovation to make America's roads safer and for everyone.

Surface Transportation

Unleashing Advanced Inspection Technology to Strengthen Rail Safety Across America. On December 5, 2025, Transportation Secretary Sean P. Duffy announced that the Federal Railroad Administration's Railroad Safety Board approved a new temporary waiver allowing U.S. railroads to significantly expand field testing of Automated Track Inspection (ATI) technology. Backed by President Trump's push to apply innovation where it delivers real results, the five-year waiver enables railroads to collect critical safety data and demonstrate how ATI technology can support inspectors by identifying defects and hazards that may be missed during routine visual inspections. By pairing human expertise with advanced sensing and data tools, this action advances rail safety, improves oversight, and reinforces America's leadership in deploying cutting edge technology to protect the nation's transportation infrastructure.

Deploying Technology and Cutting Red Tape to Put Truckers First and Keep America Moving. On June 27, 2025, Secretary Duffy unveiled a targeted set of technology-focused reforms to deliver on President Trump's Executive Order "Enforcing Commonsense Rules of the Road for America's Truck Drivers." The Department of Transportation moved aggressively to modernize Federal Motor Carrier Safety Administration's digital tools including upgrades to the Consumer Complaint Database and the DataQ system. These new digital assets are more user-friendly and transparent.

Clearing the Way for Advanced Safety Technology in America's Trucking Industry. On October 9, 2025, the Federal Motor Carrier Safety Administration issued a waiver allowing Aurora Operations, Inc., to deploy innovative cab-mounted warning beacons in place of traditional roadside warning devices. The waiver exempts Aurora from specific requirements governing warning device placement, lighting, and quantity, enabling the use of integrated beacon technology to alert other road users when a truck is stopped on the shoulder. This decision follows Aurora's exemption petition and includes crash and operational safety reporting requirements to ensure continued oversight. By allowing modern, vehicle-integrated safety technology to replace outdated requirements, this action reflects President Trump's drive to remove unnecessary barriers and let American innovation lead, while keeping safety front and center on the nation's highways.

Recharging American Maritime Dominance Through Technology, Innovation, and Industrial Strength. On April 9th, 2025, President Trump issued an Executive Order, "Restoring America's Maritime Dominance," directing decisive action to rebuild US leadership across the maritime sector. As part of this effort, the Department of Transportation will coordinate with Federal partners and industry stakeholders to develop a Maritime Action Plan focused on strengthening America's maritime future. The plan will advance technology-driven initiatives such as modernizing maritime infrastructure and capacity, investing in next generation maritime technologies, revitalizing the U.S. Merchant Marine Academy, and strengthening the skilled workforce required to operate in secure advanced maritime systems. By pairing industrial strength with cutting-edge technology, this effort positions the United States to lead globally in shipbuilding, logistics, and maritime security while reinforcing economic and national security for the American people.

Space

"With our incredible Guardians in the U.S. Space Force protecting America's interests in space, we are securing the systems that power exploration, defense, and communication. We are building strength, expanding freedom, and ensuring that the American flag remains the ultimate symbol of leadership across the final frontier."

– President Donald J. Trump, July 20, 2025

Space is the ultimate high ground for America's national security, prosperity, and scientific leadership. From GPS to communication networks to missile-warning systems, space-based assets protect our homeland, offer conveniences for every-day life, and underpin much of our modern economy. At the same time, space represents boundless opportunity: new frontiers for exploration, new industries and technologies waiting to be born, and new discoveries that will expand the boundaries of human knowledge.

Building on actions taken in his first Administration, President Trump is once again putting renewed emphasis on ensuring American superiority in space exploration, defense, and economic development. In January 2025 President Trump issued Executive Order 14186, "The Iron Dome for America," calling for a next-generation missile defense shield that will include a key element of using space-based assets to detect and intercept attacks against the United States. The Fiscal Year (FY) 2027 Administration Research and Development Budget Priorities and Cross-Cutting Actions memo, released in September 2025, calls for R&D investments to assure America's continued space dominance for both civilian and defense mission needs that prioritize ambitious targets, unlock new mission capabilities, enable discoveries, and achieve exploration goals. On December 18, 2025, President Trump signed Executive Order 14369, "Ensuring American Space Superiority," which calls for a space policy that will extend the reach of human discovery, secure the Nation's vital economic and security interests, unleash commercial development, and lay the foundation for a new space age.

President Trump has long viewed space as critical to the future of the United States. In his first Presidential Administration, he took a number of steps to renew U.S. leadership in space exploration, including issuing a series of Space Policy Directives: SPD-1 Reinvigorating America's Human Space Exploration Program (2017), SPD-2 Streamlining Regulations on Commercial Use of Space (2018), SPD-3 National Space Traffic Management Policy (2018), SPD-4 Establishment of the United States Space Force (2019), SPD-5 Cybersecurity Principles for Space Systems (2020), SPD-6 National Strategy for Space Nuclear Power and Propulsion (2020), and SPD-7 U.S. Space-Based Positioning, Navigation, and Timing Policy (2021). Specific achievements in the Trump 45 Administration include re-establishing the National Space Council, directing NASA to embark on a journey back to the Moon, the first all-woman spacewalk, the first crewed launch to the International Space Station from American soil in a commercially-built and operated American crew spacecraft, reaching new frontiers in

President Trump with OSTP Director Michael Kratsios and NASA Administrator Jared Isaacman at signing of "Ensuring American Space Superiority" Executive Order in the Oval Office. (December 18, 2025)

the robotic exploration of the Solar System (including launch of the Mars Perseverance Rover and the Parker Solar Probe), and the release, from the New Horizons mission, of the first detailed image of the most distant object ever explored in the solar system—the Kuiper Belt object nicknamed Ultima Thule.

Highlights

Space Exploration

Enabling a Meaningful and Sustained Presence on the Moon. The December 2025 Executive Order on "Ensuring American Space Superiority" refocuses America's space program to commit to a lunar surface landing by 2028, as well as establishing the initial elements of a permanent lunar outpost by 2030. These efforts will lay the foundations of lunar economic development, prepare for the journey to Mars, and inspire the next generation of American explorers. The Executive Order also calls for defending America's national and economic security interests in, from, and to space, for the first time articulating that America will detect, characterize, and counter threats to U.S. interests from very low-Earth orbit through cislunar space, including any adversary placement of a nuclear weapon in space. It also kicks off a National Initiative to focus the power of American innovation to develop nuclear reactors for

space applications. The Order calls for nuclear power demonstrations on the Moon and in space, including a lunar surface reactor ready for launch by 2030.

Getting Artemis II Ready to Send Americans Around the Moon. The Artemis Program is returning Americans to the Moon. Started by President Trump in his first term, the Nation is embarking on an exciting journey to send Americans around the Moon in 2026 for the first crewed Artemis mission. This will reaffirm our commitment to space exploration and send a clear signal to the world that America is once again leading the way to the stars. NASA recently completed stacking of its Space Launch System rocket and Orion spacecraft for Artemis II. Teams integrated elements manufactured across the country at NASA's Kennedy Space Center in Florida, including the rocket's boosters and core stage, as well as Orion's stage adapter and launch abort system. The Artemis II crew participated in more than 30 mission simulations alongside teams on the ground, ensuring that the crew and launch, flight, and recovery teams are prepared for any situation that may arise during the test flight. Soon, crew will don their survival suits and get strapped into Orion during a countdown demonstration test, serving as a dress rehearsal for launch day. NASA worked with the Department of War to conduct a week-long underway recovery test in preparation to safely collect the Artemis II astronauts after they splash down following their mission.

Expanding the Artemis Accords to Promote Peaceful Space Exploration. The Department of State led diplomatic and public diplomacy efforts to strengthen U.S. leadership in space exploration, applications, and commercialization by increasing understanding of, and support for, U.S. national space policies and programs and to encourage the foreign use of U.S. space capabilities, systems, and services. In 2020, in President Trump's first term, the U.S. launched the Artemis Accords to guide civil space exploration and use in the 21st century. In the last year, eight countries signed on including Finland, Bangladesh, Senegal, Hungary, the Philippines, Portugal, Norway, Malaysia, bringing the total to 60 signatories.

Deepening Bilateral Space Collaborations. In 2025, the U.S. hosted bilateral convenings to reaffirm enduring partnerships and commitments to the responsible and peaceful uses and exploration of outer space, including with Argentina, the Republic of Korea (ROK), the E.U., and Italy, and signed a new bilateral space framework agreement with Australia. The fourth U.S.-ROK Civil Space Dialogue, hosted by the U.S. on April 14, strengthened the U.S.-ROK Alliance through space exploration cooperation on Artemis and other missions, and facilitated ROK investments in capabilities that support shared goals in Moon and Mars exploration. In September 2025, the U.S. hosted the 13th U.S.-E.U. Space Dialogue to advance shared space priorities, including addressing space-related security threats and promote innovation by leveraging cutting-edge commercial capabilities in support of U.S. and E.U. space activities. The Positioning, Navigation, and Timing working group continued its efforts to promote compatibility and non-interference between GPS and the E.U.'s Galileo systems. The Copernicus Coordination Group shared how a mutually beneficial relationship between satellite systems allows both the United States and the E.U. to establish state-of-the-art observing systems at a lower cost to taxpayers, enabling user communities to benefit from more data, increased forecast accuracy, and better timeliness and robustness of the observing systems.

Sustaining 25 Years of Continuous Human Presence on the International Space Station (ISS). 2025 marked the 25th consecutive year of continuous human presence in America's orbiting laboratory. This remarkable achievement was made possible by the profound capacity of America's space workforce to safely build, operate, and maintain the most complex

spacecraft in history. While previous administrations allowed our focus to drift, the Trump Administration has taken decisive action to ensure America's complete dominance in space. Under the Executive Order "Ensuring American Space Superiority," President Trump has renewed America's commitment to a thriving commercial marketplace in low-Earth orbit and a pathway to replace the Station by 2030.

Commercial Space

Promoting Commercial Space Innovation by Reducing Regulatory Barriers and Enhancing Coordination. On August 13, 2025, President Trump signed Executive Order 14335 "Enabling Competition in the Commercial Space Industry," which eliminates wasteful or duplicative regulations that have long inhibited innovation in the commercial space industry. The Order elevates the Office of Space Commerce to an independent office in the Department of Commerce, giving the commercial space industry long-overdue visibility. The Order also reforms the process for authorizing novel space activities, requiring the Secretary of Commerce to propose a process for mission authorizations for activities covered under Article VI of the Outer Space Treaty of 1967. This long overdue action will provide regulatory certainty and investor confidence for new and original commercial space ventures.

Celebrating a Record Year for Space Launches. In 2025, there were a record 176 successful orbital space launches from the United States, including a record 109 launches from the Cape Canaveral Space Force Station – Kennedy Space Center range complex. Under the Executive Orders "Ensuring American Space Superiority" and "Enabling Competition in the Commercial Space Industry," President Trump recommits America to a path of space dominance and commercial space leadership, removing barriers to launch and creating new incentive structures to build space infrastructure. These actions ensure that America remains the space superpower.

Space Security

Building a Big Beautiful Golden Dome to Protect the Homeland. The January 2025 Executive Order "Iron Dome for America" commits the nation to deliver a homeland missile defense architecture to respond to the catastrophic threats of advanced missiles and aerial attacks. President Trump's Peace Through Strength vision was codified in the One Big Beautiful Bill Act, putting a $24.4 billion down payment for integrated air and missile defense that will ensure America's security for generations to come. The President took further action under the Executive Order "Ensuring American Space Superiority," calling for demonstration of protype next-generation missile defense technologies by 2028. The DOW acquisition community has rapidly realigned the nation's missile defense R&D efforts with the Golden Dome plan; the first set of awards for space-based missile interceptors were awarded in November 2025. In December, MDA awarded additional Scalable Homeland Innovation Enterprise Layered Defense contracts that will advance our homeland missile defense capabilities.

Completing Ten Launches to Support our Nation's Decisive Intelligence Advantage. The National Reconnaissance Office (NRO) launched 10 missions in 2025, including several launches of NRO's proliferated architecture. This constellation continues to add capability and resilience to our intelligence mission through shorter revisit times, increased observational persistence, and faster processing and transmission of data. Over the last two years, NRO has

launched more than 200 satellites, creating the largest and most capable government constellation in orbit in our nation's history.

Rebuilding America's Military Might in Space. In 2025, the United States Space Force (USSF) launched several missions, including the first tranche of the Proliferated Warfighter Space Architecture Tracking Layer satellites. In May 2025, the Space Force also launched the eighth GPS III satellite, enhancing the Nation's resilience for positioning, navigation, and timing (PNT) services. The USSF launched several research and development satellites, including the Navigation Technology Satellite 3 testbed, which will de-risk new resilient PNT capabilities, the X-37B Orbital Test Vehicle with several onboard experiments, and the STP-S30 mission in partnership with NASA to demonstrate the novel DiskSat architecture.

Inaugurating a New Era in Space Domain Awareness. On September 30, 2025, the United States Space Force announced the operational acceptance of the Advanced Tracking and Launch Analysis System (ATLAS), revitalizing an aging and labor-intensive capability with modern and agile practices to enable military readiness in an increasingly congested space environment. ATLAS allows the Space Force to assure spaceflight safety and observe, attribute, and respond to adversary actions in space, ensure the responsible use of space by all parties, and enable U.S. freedom of action in all orbital regimes. ATLAS is intended to eventually remove operational dependencies on the more than 30-year-old legacy Space Defense Operations Center (SPADOC) system and will provide a modernized and integrated system that enables responsive and resilient capabilities for space operations centers.

Planetary Defense: Protecting the Earth and Humanity from Natural Disasters. In defense of Earth and protecting humanity, NASA has continued to monitor a near-Earth object that triggered potential impact notifications. Scientists have worked to calculate more precise impact models, noting that the asteroid, which poses no significant threat to Earth, has only a 0.0004% chance of hitting our planet. Work continued on the NASA Near-Earth Object Surveyor mission, expected to launch in 2027, and is designed to help advance the Nation's ability to discover and characterize most of the potentially hazardous asteroids and comets that come within 30 million miles of Earth's orbit.

Space Science

Pursuing Science and Technology Demonstrations on and Around the Moon. NASA selected a host of science studies for the Artemis II mission, including efforts that focus on astronaut health, as well as those that will provide insight for mission planning and site selection for future lunar missions. Experiments and technology demonstrations aboard the Commercial Lunar Payload Services flights included an electrodynamic dust shield, a lunar navigation system, high-performance computing, and collection of more than 9,000 first-of-a-kind images of the lunar lander's engine plumes. NASA teams have studied regolith (lunar dirt and rocks) in a simulated lunar gravity environment and tested how solid materials catch fire in space. The agency's 55-pound CubeSat in lunar orbit, CAPSTONE, exceeded 1,000 days in space, serving as a testbed for autonomous navigation and in-space communications. NASA published findings from an Artemis I experiment highlighting why green algae may be a very good deep space travel companion.

Improving Our Understanding of the Sun and Space Weather. In 2025, NASA, NOAA, and mission partners launched an armada of five critical space weather missions: Polarimeter to Unify the Corona and Heliosphere (PUNCH), Tandem Reconnection and Cusp

Electrodynamics Reconnaissance Satellites (TRACERS), Interstellar Mapping and Acceleration Probe (IMAP), the Carruthers Geocorona Observatory, and Space Weather Follow On - Lagrange 1 (SWFO-L1). This historic achievement will advance the state of heliophysics science and deliver operational readiness for space weather hazards. Together, these missions will enable us to understand the mysteries of the Sun, as well as protect America's power grid, our satellites, and our way of life from the devastating effects of solar storms. In May 2025, scientists at the U.S. National Science Foundation National Solar Observatory and the New Jersey Institute of Technology used a new optical system to capture the most detailed images to date of the complex movements in the sun's atmosphere, the corona. This technology will allow scientists to better understand the extreme nature of the corona and produce computer models that more accurately predict space weather and potential Earth-impacting solar flares. In addition, NASA's Parker Solar Probe team shared new images of the Sun's atmosphere, taken closer to the star than ever captured before.

Enabling Discovery On- and Off-Planet. In 2025, NASA launched several historic science missions. The NASA-ISRO Synthetic Aperture Radar is the largest joint U.S.-India collaborative science project to date, and will provide breathtaking radar imagery of Earth's surface to enable discoveries of our home planet. NASA also launched the SPHEREx all-sky infrared survey telescope, which will capture 450 million galaxies along with over 100 million stars in the Milky Way in order to explore the origins of the universe, as well as the ESCAPADE mission to study the Martian atmosphere and real-time response to solar wind, enabling future missions to the Red Planet. ESCAPADE was launched on a Blue Origin New Glenn Rocket, marking the first time the company has successfully recovered a booster stage, and collecting data to certify the mission for future national security payloads.

Coordinating a Solar System-Wide Observation Campaign. Garnering significant interest this year, NASA has coordinated a solar system-wide observation campaign to follow comet 3I/ATLAS, the third known interstellar object to pass through our solar system. To date, 12 NASA spacecraft and space-based telescopes have captured and processed imagery of the comet since its discovery in the summer.

Promoting Progress in Astrobiology. NASA's Perseverance rover found a sample on Mars that potentially contains biosignatures, substances or structures that might have a biological origin but require additional data and studying before any conclusions can be reached about the absence or presence of life. NASA's Curiosity rover on Mars found the largest organic compounds on the Red Planet to date. Teams also are working to develop technologies for the Habitable Worlds Observatory; the agency now has tallied 6,000 exoplanets. Samples from asteroid Bennu revealed sugars, amino acids, and other life-building molecules.

Releasing Unprecedented Images of the Southern Sky. In June 2025, the NSF-DOE Vera C. Rubin Observatory, a major new scientific facility on a mountaintop in Chile jointly funded by the U.S. National Science Foundation and the U.S. Department of Energy, released its first imagery. The observatory will repeatedly conduct a survey of the southern sky to create a ten-year record of the cosmos from our vantage. In just over 10 hours of test observations, Rubin captured millions of galaxies and Milky Way stars and thousands of asteroids. The imagery is a small preview of Rubin Observatory's upcoming scientific mission to explore and understand some of the universe's biggest mysteries.

Building a Flagship Observatory and Telescope. Assembly of NASA's next flagship observatory, the Nancy Grace Roman Space Telescope, is completed, with final testing underway. The telescope will help answer questions about dark energy and exoplanets and will

be ready to launch as early as fall of 2026. The agency's newest operating flagship telescope, James Webb Space Telescope, now in its third year, continued to transform our understanding of the universe, and Hubble celebrated its 35th year with a 2.5-gigapixel Andromeda galaxy mosaic.

Spectrum and 6G

"The next generation of mobile communications networks (6G) will be foundational to the national security, foreign policy, and economic prosperity of the United States."

– President Donald J. Trump, December 19, 2025

6G networks will provide the foundation to operate cutting-edge technologies of the next decade, including AI, robotics, implantable technologies, and many other advancements. It will also deliver dramatically faster connection speeds, ultra-low latency, and higher data capacity. For the American people, next-generation wireless means expanded connectivity for underserved communities, new opportunities for telehealth and remote education, and the infrastructure backbone needed for American businesses to compete and innovate. Under President Trump's leadership, in 2025 the Administration advanced 5G and 6G leadership by executing on a massive spectrum pipeline to deliver 800 megahertz of spectrum by 2034 set out in President Trump's One Big Beautiful Bill Act; proposed to auction up to 180 megahertz of prime, mid-band spectrum by July 2027.

During President Trump's first Administration, the United States regained the lead in the development and implementation of 5G wireless communications. In September, 2018, the White House held a 5G Summit with industry and government officials to discuss policies that would help ensure faster deployment of 5G technologies. In October, 2018, President Trump signed a Presidential Memorandum on Developing a Sustainable Spectrum Strategy for America's Future calling for a National Spectrum Strategy to assess current and future spectrum needs and support the deployment of 5G through incentives and reduced regulations. But he did not rest on 5G wireless achievements. He famously tweeted in 2019, "I want 5G, and even 6G, technology in the United States as soon as possible. It is far more powerful, faster, and smarter than the current standard." In his first term, President Trump inaugurated the FCC's Rural Digital Opportunity Fund and a $9 billion 5G Fund for Rural America, as well as awarded nearly $750 million from USDA to support over 80 projects to provide rural broadband access for more than 430,000 rural residents in 34 States; launched the American Broadband Initiative (ABI), accelerating U.S. leadership in 5G spectrum with the development of the FCC's 5G Fast Plan and concluded the first-ever mid-band 5G spectrum auction; signing the Secure 5G and Beyond Act into law, including delivering the National Strategy to Secure 5G called for in the Act; signing an Executive Order on Securing the Information and Communications Technology and Services Supply Chain, including banning the use of certain equipment and services from adversary nations; and prioritizing R&D on wireless communications (e.g., the NSF Platforms for Advanced Wireless Research (PAWR) program—a $100 million public-private partnership to establish national resources for researchers—and the DARPA Spectrum Collaboration Challenge, among many other government R&D programs).

Highlights

6G Innovation

Unlocking Spectrum Resources for 6G. On December 19, 2025, President Trump signed a Presidential Memorandum entitled "Winning the 6G Race." This Memorandum unlocks 275 MHz of mid-band spectrum for 6G development, consistent with the provisions of the One Big Beautiful Bill. In addition, the Memorandum outlines a strategy to ensure America is at the forefront of 6G development globally, coordinating activities across departments and agencies in advance of the World Radiocommunications Conference, as well as directing studies of the 2.69-2.9 GHz and 4.4-4.94 GHz bands.

Announcing 6G Wireless Testbeds for the 2028 Summer Olympic and Paralympic Games. On October 29, 2025, the Department of Commerce announced an industry-led initiative to demonstrate next-generation wireless technologies during the 2028 LA Olympics. The project, dubbed Mission LA 2028, will catalyze American leadership in wireless technologies, find solutions to long-held regulatory barriers, and facilitate next-generation spectrum availability. LA Mission 2028 will enable industry stakeholders to provide 6G demos at the 2028 Summer Olympics. NTIA has received seven letters of intent from companies planning to participate.

Strengthening U.S. leadership in Next-Generation Wireless Technologies. In June 2025, NSF launched the $100 million Verticals-enabling Intelligent Network Systems (VINES) program to strengthen U.S. leadership in next-generation wireless technologies and the industries they enable. The initiative invests across the full edge-to-cloud network stack, pairing use-inspired fundamental research with higher-readiness prototypes that support critical applications such as autonomous transportation, smart grids, disaster response, advanced manufacturing, precision agriculture, and remote health care. Backed by strong public-private partnerships—including Intel, Ericsson, Qualcomm, key Federal agencies, and funding agencies in Finland, Japan, India, and Sweden—VINES integrates AI, machine learning and emerging quantum networking concepts to shape global standards, expand secure and resilient communications infrastructure, and prepare an American workforce ready to lead in next-generation wireless and future telecom innovation.

Accelerating the Development of Critical and Emerging Technologies, Including Advanced Wireless. Together with Federal and industry partners, NSF's Directorate for Technology, Innovation, and Partnerships (TIP) made inaugural investments in 2025 totaling $72 million in advancing the state of practice in critical technologies, ranging from accelerating the adoption of cell-free systems for the next generation of advanced manufacturing, to advancing next-generation wireless networks by breaking through existing barriers to low latency in networks, and reshoring U.S. leadership in 5G and beyond. In August 2025, NSF announced an initial investment of more than $17 million over two years to advance U.S. technological leadership in next-generation wireless networks. Three teams comprised of multiple industry and academic partners were funded through the Breaking the Low Latency Barrier for Verticals in Next-G Wireless Networks (Breaking Low) initiative. These NSF Breaking Low teams will identify and solve critical architectural, technical and technological issues that address key barriers in current fifth-generation (5G) and next-generation (Next-G) wireless networks. Breaking Low was designed specifically to advance U.S.-developed

wireless telecom technologies, and also to position the United States to take the lead in many emerging application "verticals" such as telemedicine, remote health care, and intelligent transportation.

Broadband

Restoring Spectrum Auction Authority and Unleashing Americas Airwaves. On July 4, 2025, President Trump signed the One Big Beautiful Bill Act into law, which restored the FCC's spectrum auction authority. In addition, the Act paves the way to repurpose 800 MHz of spectrum for exclusive commercial use, including 500 MHz of Federal spectrum. Per the statutory direction, NTIA must identify 200 MHz of Federal spectrum by July 2027 and the remaining 300 MHz by July 2029 for auction in 2029 and 2033, respectively. The FCC adopted rules and announced the 2026 auction of low-band, AWS-3 spectrum; established sharing rules for 600 megahertz in the 37 GHz band; moved large swaths of underused spectrum into the hands of those who can put it to productive use quickly, including approving transactions that will deliver more investment and network capacity; approved cutting-edge multiband radios that will accelerate wireless builds and reduce unnecessary deployment costs; established a framework for automakers to transition to the next generation of wireless technology for connected cars; and deleted nearly 400 wireless regulations that are obsolete, unused, or duplicative.

Relaunching Biden's Broken Broadband Initiative to Connect Americans and Save $21 billion. On June 6, 2025, the Department of Commerce relaunched the broadband rollout in the Infrastructure Investment and Jobs Act, the Broadband Equity, Access, and Deployment (BEAD) Program, to eliminate bureaucratic red tape, market-distorting restrictions, and heavy-handed, extralegal social mandates. Thanks to these "Benefit of the Bargain" reforms, the program saw a surge in participation, competition, and private sector matching contributions—driving down costs, increasing skin in the game, and advancing innovative solutions for consumers. To date, the restructured program has approved deployments for 37 states and territories and generated a savings of at least $21 billion. Reforms to the $42 billion BEAD program include eliminating bureaucratic red tape, market-distorting restrictions, and heavy-handed, extralegal social mandates, restoring the program to its statutory objective. The Department also launched the Environmental Screening and Permitting Tracking Tool to expedite NEPA reviews under BEAD.

Reforming Tribal Broadband Programs. In November 2025, NTIA inaugurated an effort to reform Tribal broadband programs, to reduce red tape for Tribal governments and bring the Tribal Broadband Connectivity Program (TBCP) and Digital Equity Native Entity Set-Aside Program in line with BEAD. In December 2025, NTIA announced $6.5 million in funding to advance tribal broadband access, as well as formal consultations with Tribal governments in January 2026 to inform this reform effort.

Space Applications

Delivering Space Spectrum Leadership. President Trump's December 2025 Executive Order 14369 (Ensuring American Space Superiority) highlights the importance of maintaining spectrum leadership to enable the space economy. Under the Executive Order, the Department of Commerce will coordinate with heads of relevant agencies to identify opportunities for spectrum leadership for space applications. Additionally, the Federal

Communications Commission has undertaken several proposed rulemakings to unlock space spectrum resources, including an April 2025 proposal entitled "Modernizing Spectrum Sharing for Satellite Broadband," a May 2025 proposal, "Satellite Spectrum Abundance", and an October 2025 proposal, "Facilitating More Intensive Use of Upper Microwave Spectrum." Together, these proceedings will deliver several gigahertz of new spectrum resources for next-generation space technologies.

Streamlining Access to Space Launch Spectrum. On May 2, 2025, the Federal Communications Commission, in coordination with the Department of Commerce, announced new licensing and coordination procedures for space launch service licensees. Applicants can use the new Space Launch Frequency Coordination Portal to request access to space launch spectrum, removing myriad layers of administrative burdens and simplifying the user experience for space operators.

Licensing the Largest Satellite Constellation Ever. On January 9, 2026, the Federal Communications Commission granted SpaceX a major authorization to advance its second-generation Starlink satellite system. Under this grant, SpaceX is authorized to construct, deploy, and operate an additional 7,500 satellites to deliver high-speed, low-latency internet service globally, bringing the total authorized constellation to 15,000 satellites. This new action enables Starlink to provide direct-to-cell connectivity and operate in new orbital regimes.

Modernizing the Space and Earth Station Licensing Process. On October 7, 2025, the Federal Communications Commission issued a Notice of Proposed Rulemaking to overhaul the Commission's space and earth station licensing process to ensure that new space-based industries, space exploration capabilities, and cutting-edge defense systems are pioneered in America. The proposal reforms a number of cumbersome requirements and develops a "licensing assembly line" so applications are routed along different paths for the most efficient review, providing enhanced predictability and flexibility to applicants.

Advanced Manufacturing and Materials

"This miracle that's taken place in the USA... We're going to support the many thousands of American jobs that have been created and help solidify the USA as the world leader... in advanced manufacturing and other vital industries"

– President Donald J. Trump, November 18, 2025

A healthy manufacturing base is essential to American economic strength and national security. For too long, offshoring has hollowed out American industry, eliminated factories, displaced our workers, and created dangerous dependencies on foreign suppliers. The Trump Administration is reversing this trend through a whole-of-government approach to reshore production, using tariffs to level the playing field, directing a coordinated workforce and apprenticeship strategy, streamlining permitting to accelerate project timelines, and securing historic investment commitments to build factories on American soil and create American jobs. These actions build on President Trump's first-term leadership, including Executive Order 13806 to strengthen the manufacturing and defense industrial base, early tariff actions to shift global supply chains back to the United States, and the American AI Initiative that directed efforts to leverage AI for manufacturing.

In Year One of President Trump's return to office, departments and agencies have coordinated efforts at full speed to eliminate foreign dependencies across critical supply chains, drive innovation in advanced manufacturing, leverage AI to transform factory operations and accelerate materials discovery, and seed technological capabilities that will create jobs in America. The Manufacturing USA Institute Network is advancing breakthrough technologies across photonics, robotics, and flexible hybrid electronics, while NSF investments are shaping the next generation of biomanufacturing and quantum manufacturing capabilities. The Administration has also prioritized workforce development, supporting the first-of-its-kind Manufacturing Occupation and Competency Framework to ensure American workers are prepared to fill these new roles.

Advanced materials also remain foundational to this effort. From the Stone, Bronze, and Iron Ages, to the Silicon Age that has powered the digital revolution, entire periods of civilization have been named for the materials that defined them. The Administration recognizes the imperative for the United States to lead the development and production of next-generation materials and rebuild our ability to mine and refine critical minerals essential to next-generation industries—from semiconductors and quantum devices to batteries and aerospace systems. In 2025, the Administration has moved to secure these supply chains, expanding domestic minerals mapping and processing capacity, accelerating permitting for critical minerals projects, and invested extensively in the data and AI tools needed to drive materials discovery and accelerate the advanced materials manufacturing industry at home.

Highlights

Advanced Manufacturing

Advancing Manufacturing Innovation. The Manufacturing USA Institute Network creates collaborative manufacturing innovation spaces where members from industry, academia and government gain perspective from each other and solve America's manufacturing challenges. They work jointly to advance technological innovations toward commercial viability through process transformations and overcoming technical challenges. These efforts will ensure American inventions are scaled-up and turned into American Made products. For example, the AIM Photonics Manufacturing USA Institute is working with industry to overcome technical and manufacturing obstacles to the widespread deployment of photonic computing, a potential option for improving energy efficiency of AI. Researchers supported through AIM Photonics have taken a pivotal step by demonstrating a manufacturable photonic memory device that functions as an optical counterpart to traditional static random access memory and addresses a long-standing gap in optical system design. In October, the NextFlex Manufacturing USA Institute launched a regional hub in Huntsville, Alabama, to provide regional supply chain support and support the growth of hybrid electronics. The Alabama Node will accelerate the commercialization of hybrid electronics by boosting innovation, technology transition, and adoption. A matching $20 million state grant will fund electronics manufacturing infrastructure, analysis capabilities, and support technology, workforce, and economic development statewide. In November 2025, Advanced Robotics for Manufacturing (ARM) Manufacturing USA Institute signed a $87 million Cooperative Agreement with Air Force Research Laboratory to perform research, development, testing, and evaluation to advance the state of the art in dual-use robotics and automation technologies of interest to

President Trump visiting U.S. Steel Mon Valley Works-Irvin Plant. (May 30, 2025)

the Air Force. In December 2025, ARM announced new research projects on multi-modal inputs for AI robotics in manufacturing; rapid re-tasking and robot agility; multi-robot, multi-human collaboration; and adaptive real-time path planning and control. Also in November, the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL) and the Open Applications Group, Inc. (OAGi) released Biopharmaceutical Manufacturing Ontologies designed to enhance data interoperability and analytics capabilities across the biopharmaceutical industry.

Developing a First-Of-Its-Kind Manufacturing Occupation and Competency Framework. The Manufacturing USA network developed the 2025 Manufacturing USA Occupation and Competency Framework to equip job seekers, employers, and trainers with the common language and linkages needed to successfully meet the advanced manufacturing industry's workforce needs. The framework outlines the most common entry-level occupations in advanced manufacturing across the Manufacturing USA network; specifies the knowledge, skills, and abilities that workers need, both now and into the future, to work with cutting-edge manufacturing technologies across 18 technology areas; and provides a common language around occupations, skills, and competencies to improve collaboration industry, training providers, workers, and among the Manufacturing USA institutes.

Enhancing Manufacturing Technologies Through AI. NSF-supported researchers developed a new AI model that sees inside a factory, understands what is happening, and suggests ways to solve problems, making manufacturing smarter, safer, and more competitive. While AI has already transformed fields like medicine and finance, factories present a different challenge for AI: they are structured, fast-paced environments that rely on precision and critical timing. The new AI model designed specifically for manufacturing that combines image analysis and natural language processing, seeks to address this challenge and revolutionize how factories operate. Additionally, in May 2025, NSF funded the Center for Smart Manufacturing Using AI-based Revolutionary Technologies (SMART) at the University of Alabama. The SMART center will leverage data collected through sensors and cameras during the manufacturing process to create and integrate AI technologies that transform the manufacturing sector, delivering enhanced productivity, product quality, factory sustainability, and workforce safety. NSF also awarded a planning grant to North Carolina State University to leverage ultrasound device fabrication, integrated electronics, and artificial intelligence for manufacturing intelligent ultrasound systems for sensing, imaging, therapy, and drug delivery. The center will be a hub in the United States of America to train undergraduate and graduate students and post graduate professionals who will ensure the US leads ultrasound innovation and economic development via transformed manufacturing industry for ultrasound healthcare products. K-12 students will also have access to an unprecedented ultrasound resource for physics and biomedicine education.

Developing New Manufacturing Capabilities and Creating Jobs in the United States. In June 2025, NSF announced a $25.5 million investment to support fundamental research and workforce development aimed at enabling future generations of U.S. manufacturing. This year's awards will support seven research grants and nine seed projects across 36 institutions and companies through the NSF Future Manufacturing (NSF FM) program. NSF FM supports research that will shape the next generation of biomanufacturing, cyber manufacturing, eco manufacturing, and quantum manufacturing, often with the help of AI. A key goal is to bring together teams from across disciplines to create new, transformative manufacturing capabilities and keep more manufacturing in the U.S.

Accelerating the Adoption of Cell-Free Systems. NSF announced an inaugural investment of $32.4 million to four teams to accelerate the adoption of cell-free systems, enable new applications of this technology and contribute to the growth of the U.S. bioeconomy. The NSF Advancing Cell-Free Systems Toward Increased Range of Use-Inspired Applications (NSF CFIRE) initiative will reduce the cost of cell-free systems in biochemical processes, increase the range and capabilities of cell-free systems, and develop and demonstrate cost-effective use-inspired applications. Cell-free systems offer a promising alternative to traditional cell-based applications in biotechnology, advanced manufacturing and other industries.

Funding Research and Development of 3D Printing of New Materials. NSF-funded researchers developed a high-speed printing method for manufacturing complex antenna designs tailored for 5G/6G applications, achieving over 90% weight reduction over conventional antenna designs. This technology could enable the rapid manufacturing of a host of other 3D-printed electronic devices. The researchers have transitioned their research from academia into a startup company specializing in the development and manufacturing of tactile sensors and haptic devices.

Advanced Materials

Building on the Materials Genome Initiative (MGI) to Drive a New Era of Materials Discovery. Departments and agencies are collaborating and leveraging research and infrastructure efforts through the MGI to vastly accelerate the discovery to deployment timeline for new materials by integrating theory, data, experiment, and computation—including AI and autonomous experimentation. For example, NSF's Designing Materials to Revolutionize and Engineer our Future (DMREF) program has fostered a prolific research community that is redefining the pace of science. In 2025, the DMREF program reached an important milestone: producing over 4,000 publications and achieving 100,000 citations. This tremendous volume of high-quality research corresponds to a knowledge-generation rate of roughly one publication per day and one citation per hour, fueling a continuous cycle of innovation that keeps the United States at the forefront of global materials science. In 2025, NSF awarded $50 million to new DMREF awards supporting researchers across 25 states in partnership with the Air Force Research Laboratory, the Department of Energy, the National Institute of Standards and Technology, the Office of Naval Research and the U.S. Army Combat Capabilities Development Command, as well as funding agencies in Canada, Germany, India, and Israel. Research teams will use AI and other new methods to discover materials and optimize their properties for next generation applications including semiconductors, quantum devices, wireless technology, biotechnology, fusion energy and structural materials.

Leading Efforts to Advance the AI for Material Science Ecosystem. The MGI community came together to address several challenges in 2025. In July, NIST sponsored an Artificial Intelligence for Material Science workshop to discuss ways in which AI can be leveraged to solve key autonomous experimentation challenges. In August, NIST co-sponsored a hackathon to build better collaboration across groups developing software for self-driving laboratories to increase efficiency, avoid duplication, and reduce maintenance cost and time. In September, NIST sponsored the Workshop Towards an Autonomous Materials Research Ecosystem. The goal of this workshop was to bring together stakeholders, both platform end-users and vendors, to determine the feasibility of such an ecosystem and identify concrete steps towards realizing this goal. In September 2025, a new report explored MGI's progress

and future outlook, showcasing advances in autonomous experimentation, sustainable polymers, next-generation batteries, and the broader role of AI in engineering.

Creating World-Class Infrastructure for Materials Data. The Administration continues to prioritize the expansion of Federal materials databases, recognizing them as the bedrock of modern AI-driven science. The Department of Energy's (DOE) Materials Project, a premier open-access resource, has been instrumental in the past two years, serving as the foundational dataset for the Google DeepMind GNoME AI model which successfully predicted 2.2 million new crystal structures. Simultaneously, the multi-agency Materials Data Facility (MDF), supported by NIST, DOE, and NSF, operates as a critical, scalable data backbone for the U.S. research ecosystem, uniquely bridging the gap between massive experimental output and next-generation AI. Unlike standard repositories, MDF specializes in the automated capture and delivery of multi-terabyte to petabyte-scale datasets, ranging from raw beamline data at DOE user facilities (enabling 50x faster analysis) to the 400 TB OMol25 electronic structures dataset hosted in partnership with Meta, Argonne, NIST, and LBNL. By converting these diverse, distributed resources into "AI-ready" formats, MDF provides the essential high-fidelity training fuel required for Scientific Foundation Models. With deep integration into Genesis-aligned efforts like ISAAC, CascAlde, and the Model Consortium, MDF not only aggregates the data necessary for autonomous discovery but actively democratizes it, empowering agents and researchers alike to accelerate American leadership in materials design and catalysis. These facilities, backed by tens of millions in Federal investment, have fundamentally altered the pace of research, reducing the timeline for materials discovery from decades to mere months.

Critical Minerals

Developing Resources to Aid American Mineral Dominance. In 2025, under Executive Order 14154, USGS took a major step forward in mineral supply chain forecasting by releasing the inaugural World Minerals Outlook and the 2025 List of Critical Minerals. These groundbreaking products forecast global production capacity for seven critical minerals (and helium) through 2029 and introduce the world's most advanced criticality model that evaluates over 1,200 trade scenarios for 84 mineral commodities and 402 industries and forecast potential impacts to the U.S. economy. These forward-looking analyses equip policymakers and industry leaders to anticipate vulnerabilities, prioritize strategic investments, and strengthen trade relationships—ensuring U.S. economic resilience and mineral security in an increasingly competitive global market. Also in support of Executive Order 14154, USGS advanced the Earth Mapping Resources Initiative (Earth MRI) to identify critical mineral resources fundamental to U.S. economic and national security. Earth MRI has tripled the Nation's coverage of advanced geophysical data and collected an unprecedented 850,000 square kilometers of airborne hyperspectral data in the southwestern United States, the largest hyperspectral survey ever conducted. The program also published national mine waste sampling protocols and partnered with 21 states to collect data on aboveground critical mineral resources found in mine waste. These efforts provide essential datasets for pinpointing areas most prospective for critical minerals, enabling informed decisions on strategic investments and supply chain resilience. The new data have resulted in identifying new mineral deposits, new permits for mineral development, and have bolstered State minerals expertise.

Expanding U.S. Critical Minerals Processing. In July 2025, the Department of War entered into an agreement with MP Materials invest $400 million in equity, making the Federal government the company's largest shareholder at 15%, alongside a 10-year price floor guarantee for neodymium-praseodymium and a 100% offtake commitment for 7,000 metric tons per year of rare earth magnets. The deal is designed to de-risk MP's rapid expansion of domestic magnet manufacturing capacity to satisfy the vast majority of U.S. demand. In December 2025, Commerce awarded $210 million in funding to Crucible Metals to support an advanced smelter and critical minerals processing facility in Tennessee, with expected capital expenditures of $6.6 billion. The facility will process 13 critical and strategic minerals and chemicals vital to semiconductors and AI, such as gallium, germanium, indium, and semiconductor-grade sulfuric acid, to ensure a secure supply chain for our domestic manufacturing base.

Accelerating Permitting for Minerals Production. In the last year, EPA issued NPDES/SDWA UIC permits or participated in the interagency review or permitting process for 44 minerals projects, including lithium, silver, copper, cobalt, nickel, potash, titanium, manganese, zinc, and graphite. These materials are critical in semiconductors, circuit boards, battery storage, and several other data center components. In addition, EPA is working with metals recovery companies to apply for permits to implement remediation projects at eligible abandoned hardrock mine sites.

Exploring the Ocean Floor for Critical Minerals. NOAA supported the mission of a new autonomous underwater vehicle, Orpheus, which successfully collected the first direct observations of manganese nodules on the seafloor in ultra-deep waters near the Mariana Trench. Orpheus successfully dove to depths exceeding 18,373 feet. This expansion in exploration is also accelerating through a partnership with Fugro to enhance deep ocean mapping and characterization efforts.

Advancing Research for Rare Earth Material Independence. In addition to the Administration's efforts to increase mining and processing of rare earth elements, research efforts are underway to improve separation technologies and to develop alternative materials to eliminate the need for these critical minerals. Researchers at the Pacific Northwest National Laboratory (PNNL) developed a system to use magnetic fields to collect and separate critical materials from mixed solutions. This work will enable researchers to have a deeper understanding of how to better collect critical materials based on their magnetic properties. NSF supported university research using a quantitative phase field model to unravel the mechanism underlying nanostructure formation to develop a novel permanent magnet composed of earth-abundant elements (iron, aluminum, nickel, cobalt) that can outperform other permanent magnets at high temperatures. These magnets will reduce U.S. dependence on rare-earth elements, improving economic and national security.

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