

From Energy Use to Air Quality, the Many Ways Data Centers Affect US Communities

Energy prices and water use aren't the only ways data centers affect U.S. communities. We break down the impacts — and how some states are dealing with them.

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AI tools like ChatGPT, navigation apps and streaming platforms feel effortless, drawing information seemingly from thin air. Yet the infrastructure behind them is anything but invisible.

Across the country, a surge of new data centers is reshaping local energy grids, water systems and land use. This rapid expansion is often happening with limited public information about the long-term impacts — or benefits — new data centers could bring.

Rising power bills and rampant water use tend to be top of mind. Yet it's increasingly clear that data centers will have impacts far beyond this, with real implications for communities' well-being.

While the rise in data centers is all but inevitable, the *way* it happens is not. Data centers power modern life and can bring both investment and jobs. Clear rules on energy procurement, water use, land siting, community engagement and cost recovery will determine whether this growth strengthens local economies and infrastructure — or shifts risks to residents.

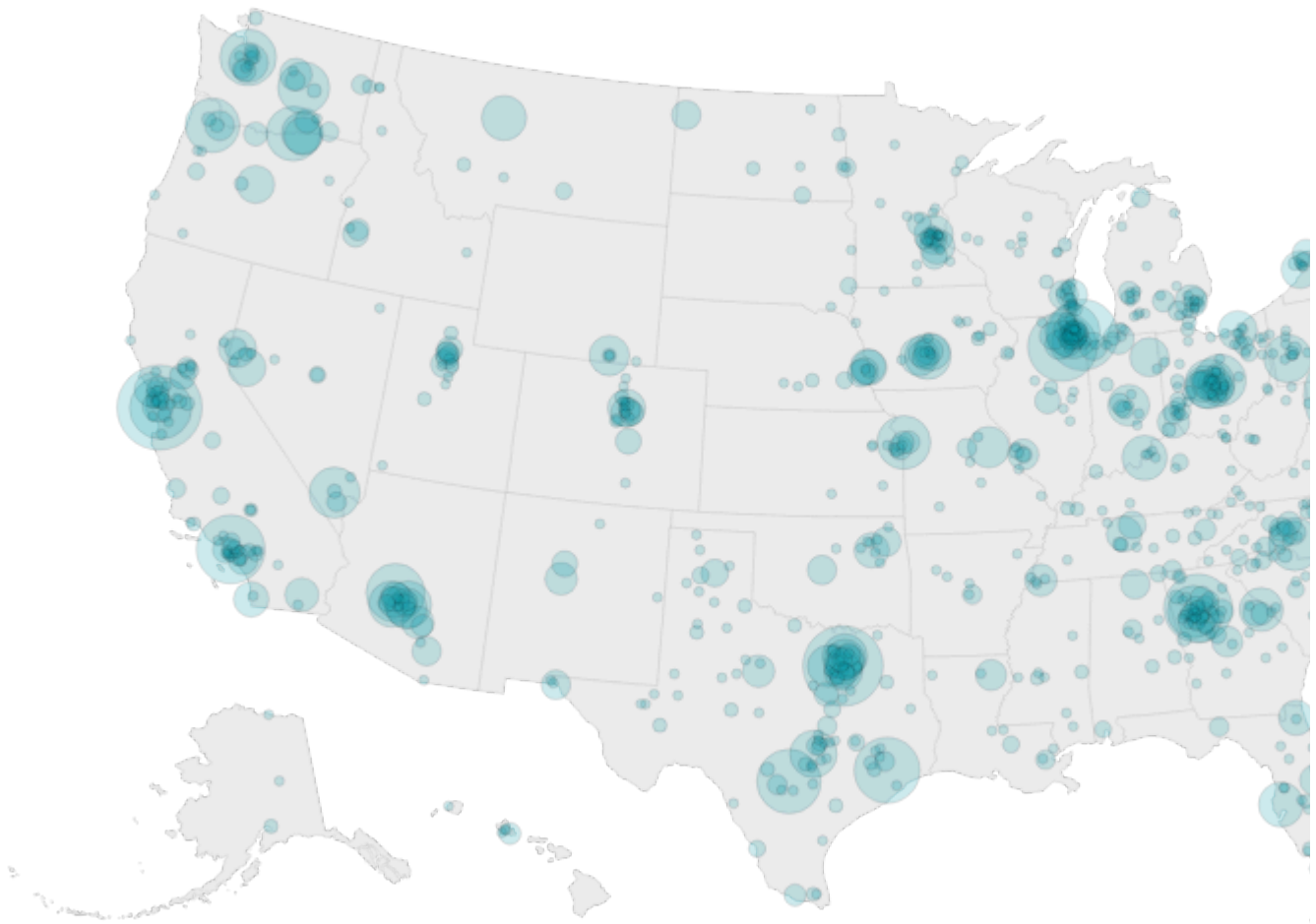
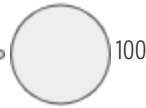
The US Data Center Boom

Data centers are the physical infrastructure of the internet. They house the servers, networking equipment and supporting systems — such as cooling, power backup, fire suppression and security — that keep digital services running reliably.

Data centers first emerged in the mid-20th century and proliferated during the 1990s alongside the rise of the internet. But today's expansion is unfolding at a much larger scale and faster pace than ever before. It's fueled by billions of dollars in [private investment](#), [state tax incentives](#), and federal directives aimed at [fast-tracking permitting](#). These policies are prioritizing large, AI-related facilities in a bid to strengthen [U.S. competitiveness](#).

Data center locations across the U.S.

Number of data centers per city 1



Note: Includes data centers that are operational, planned, land-banked, or under construction. Data as of 1/22/2026.
Source: datacentermap.com.
26.01.21



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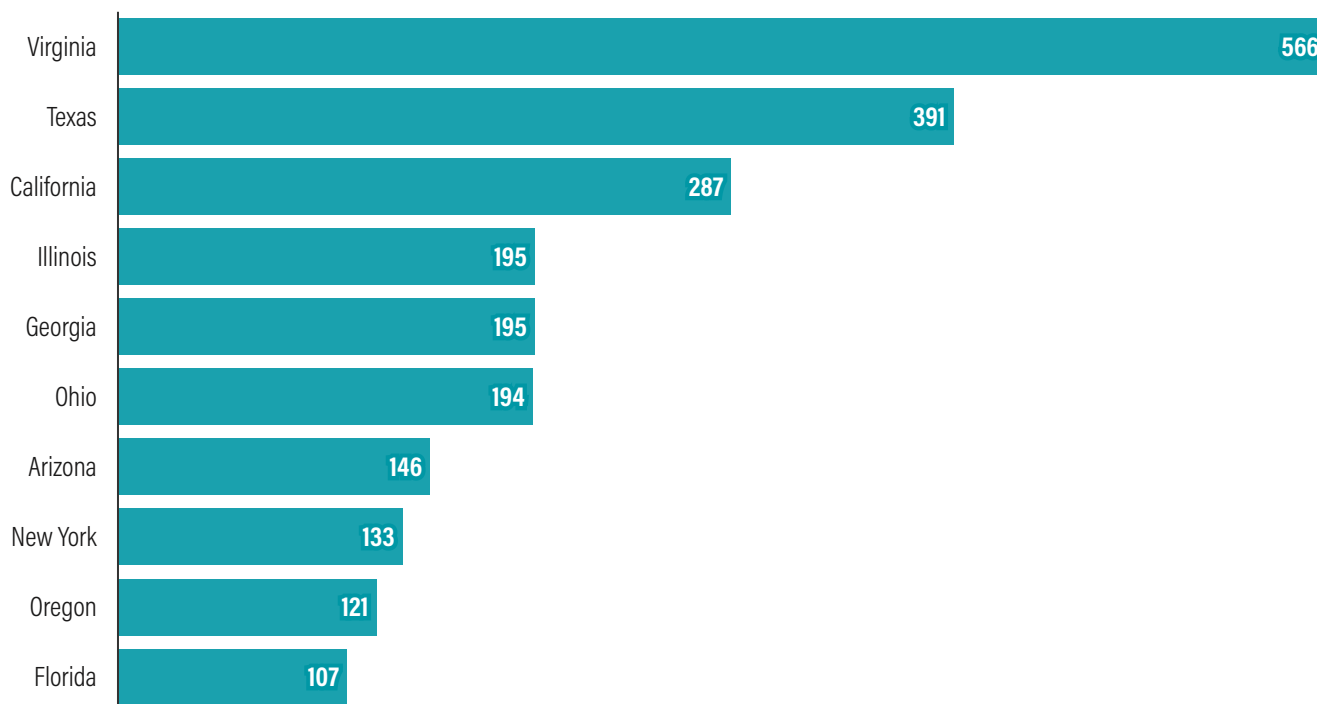
These facilities can take many forms, ranging from small server rooms inside of office buildings to massive, stand-alone [campuses](#) the size of hundreds of football fields. This last category, often known as “hyperscale” data centers, has drawn particular attention thanks to their size, rapid growth and substantial impacts on local communities.

There were just over [3,900](#) data centers across the United States as of late January¹ — nearly 37% of the world’s total. Yet market trends [suggest](#) that hyperscale development is highly concentrated in just a few regions. These areas function as national hubs for cloud and AI infrastructure, hosting a disproportionate share of large-scale facilities relative to their size.

Virginia, often described as “[the data center capital of the world](#),” hosts the largest number of facilities, followed by Texas and California. Together, the top 10 states account for roughly 60% of all data centers nationwide.

60% of U.S. data centers are found in 10 states

Top 10 states with the most data centers



Note: Data as of 1/22/2026.
Source: datacentermap.com.
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How Data Centers Affect Communities — and How Governments Are Responding

As data centers multiply across the country, so do their impacts. We examined seven ways this growth is reshaping local conditions — and looked at emerging governance practices that can help manage trade-offs.

1) Managing soaring energy demand

As technology advances and computing demand grows, data centers are becoming [increasingly energy](#) hungry. A single modern AI data center can use as much power as [100,000 homes](#); many of the larger ones now being built are expected to consume up to 20 times that amount.

Estimates of total future power demand from data centers vary significantly. One study from the Lawrence Berkeley National Laboratory found that data centers could represent up to 12% of all U.S. electricity consumption by 2028. Another analysis, by Grid Strategies, says that up to 90 gigawatts (GW) worth of data centers could come online by 2030. That's about 9 times New York City's peak summer demand joining the grid in less than five years.

This adds to concerns about rising power bills across the United States. 2025 saw over \$60 billion worth of rate increases countrywide, with Americans paying almost 10% more for electricity on average compared to 2024. The reasons for these rate hikes are complex and variable. However, there's evidence that the need to procure and build new energy infrastructure for data centers contributed to price increases in at least one region (the Mid-Atlantic). Other regions could see the same if safeguards aren't put in place.

Many states and utilities are exploring ways to ensure that data centers can come online without shifting costs to other ratepayers. Last year, utility AEP Ohio introduced a new rate schedule for data centers requiring them to pay for at least 85% of the energy they are subscribed for, regardless of how much they actually use. Other states, like Oregon, Minnesota and Missouri, have required utilities to create new billing classes and rate structures for large energy users so that their costs aren't shared by households and businesses.

2) Protecting local water supplies

Data centers require huge amounts of water to keep servers cool enough to function. Mid-sized facilities can use up to 300,000 gallons of water a day, while large facilities can consume as much as 5 million gallons daily — comparable to what a small town uses. Recent estimates project that by 2028, AI-related data centers in the U.S. could require up to 32 *billion* gallons of water annually. This is enough to support roughly 360,000 households' indoor water use.

This massive demand is a pressing problem for communities already facing drought or depleting water supplies. Two-thirds of all data centers built or in development since 2022 are located in water-stressed areas like southern Arizona, the Colorado River Basin and Texas.

This has prompted public concern and [governance action](#) in some communities. In [South Carolina](#), for example, residents near an overdrawn aquifer sought limits on data center ground water withdrawals. Others are asserting greater oversight through water-use monitoring, drought contingency planning, and site-specific water risk assessments that evaluate impacts on local water supplies. Some data centers are using cooling approaches that reduce water demand, such as traditional [air cooling or liquid immersion](#). Others are leveraging [reclaimed wastewater](#) from utilities instead of drawing from local supplies.



The Mesa Data Center near Phoenix, Ariz. Two-thirds of U.S. data centers built or in development since 2022 are in water-stressed areas. Photo by Around the World Photos/Shutterstock

3) Reducing air pollution and climate impacts

Data centers need a constant and reliable power supply. Many facilities rely on gas-fired generation for routine operations alongside diesel generators for emergency backup. Both come with climate and health risks.

Some data centers house gas power on-site for day-to-day operations, creating continuous air pollution and greenhouse gas emissions. One of the most visible examples is unfolding in Memphis, Tennessee, where more than 30 natural gas

turbines intended for daily use are being installed at xAI's new Colossus data center. Local residents and the NAACP filed a notice with [intent to sue](#) under the Clean Air Act, arguing that the project could [worsen already dangerous air quality](#) in a city that faces high asthma rates and longstanding environmental health disparities.

Diesel-fueled backup generators also release harmful air pollutants, including fine particulate matter (PM2.5) and nitrogen oxides (NOx), linked to respiratory disease, heart disease, asthma and other serious health risks. Although these generators are [only used during emergencies](#), they can have outsized health impacts, emitting [200 to 600 times](#) more nitrogen oxides than natural gas plants. One analysis in Virginia estimated that even limited backup generator use could already be associated with nearly [\\$300 million in annual public health](#) costs and 14,000 asthma-related health impacts across multiple states.

Some facilities are beginning to adopt cleaner on-site power alternatives. [Battery energy storage systems](#) can replace diesel generators during outages, avoiding their high pollution. Pairing hybrid [microgrids](#) with renewables is another alternative that supports community resilience without increasing emissions. Local and state officials can help by integrating clean power and emissions considerations into permitting and comprehensive planning; requiring companies to disclose on-site power strategies; and evaluating cleaner alternatives during permitting review.



Some data center campuses, like the Skybox Power Campus near Austin, Texas, are being built with power infrastructure onsite. Photo by Steve Heap/Shutterstock

4) Mitigating noise

Data center construction, rooftop cooling systems and backup generators can be disruptively noisy. Smaller diesel generators reportedly [reach 85 decibels](#), levels that can harm hearing. Larger industrial units can approach 100 decibels — equivalent to a motorcycle or jackhammer.

This noise can last for hours or days at a time. Residents in Loudon County, Virginia, [reported](#) disruptions in sleep, headaches and even lower quality of life because of a nearby data center, experiences that were echoed during a recent [congressional roundtable](#).

To address this, some data center developers and local governments are beginning to use measures such as natural acoustic [barriers](#), greater setbacks from homes and improved insulation for backup generators. Emerging technologies, including liquid cooling and improved airflow design, can also lower fan and HVAC noise. In places where [zoning codes](#) include noise protections, local governments can use the permitting processes to require projected decibel levels, noise mitigation plans and ongoing monitoring commitments.

5) Addressing competition for land

Massive data centers are reshaping how land is used in many communities. In 2024, the [average data center site](#) covered about 224 acres or 0.35 square miles — roughly the size of 450 football fields. This represents a 144% increase since 2022.

Developers are increasingly seeking large parcels for multi-building campuses that allow for phased construction and future expansion. Hyperscale facilities require even more land, with the largest campuses exceeding 1,000 acres, or about 1.6 square miles, according to a recent report from the [Wisconsin Farm Bureau](#).

This often intersects with agricultural and rural land uses. In Wisconsin, where about 50 data centers are located, [residents have concerns](#) that rezoning for data center development could accelerate the loss of productive farmland, which is already declining due to development pressures, land consolidation and competition. Similar tensions have surfaced across rural communities in Ohio, [Indiana](#) and [Virginia](#). In Ohio, a proposal to rezone 300 acres of farmland to support data center development sparked such widespread opposition that the landowners ultimately [withdrew their application](#).

Some local governments are exploring policies to treat data centers as a distinct land use, steer development away from prime farmland and apply additional reviews to large-scale projects. These approaches can include strengthened agricultural zoning and implementing performance standards to address buffering, traffic, noise and long-term site management.

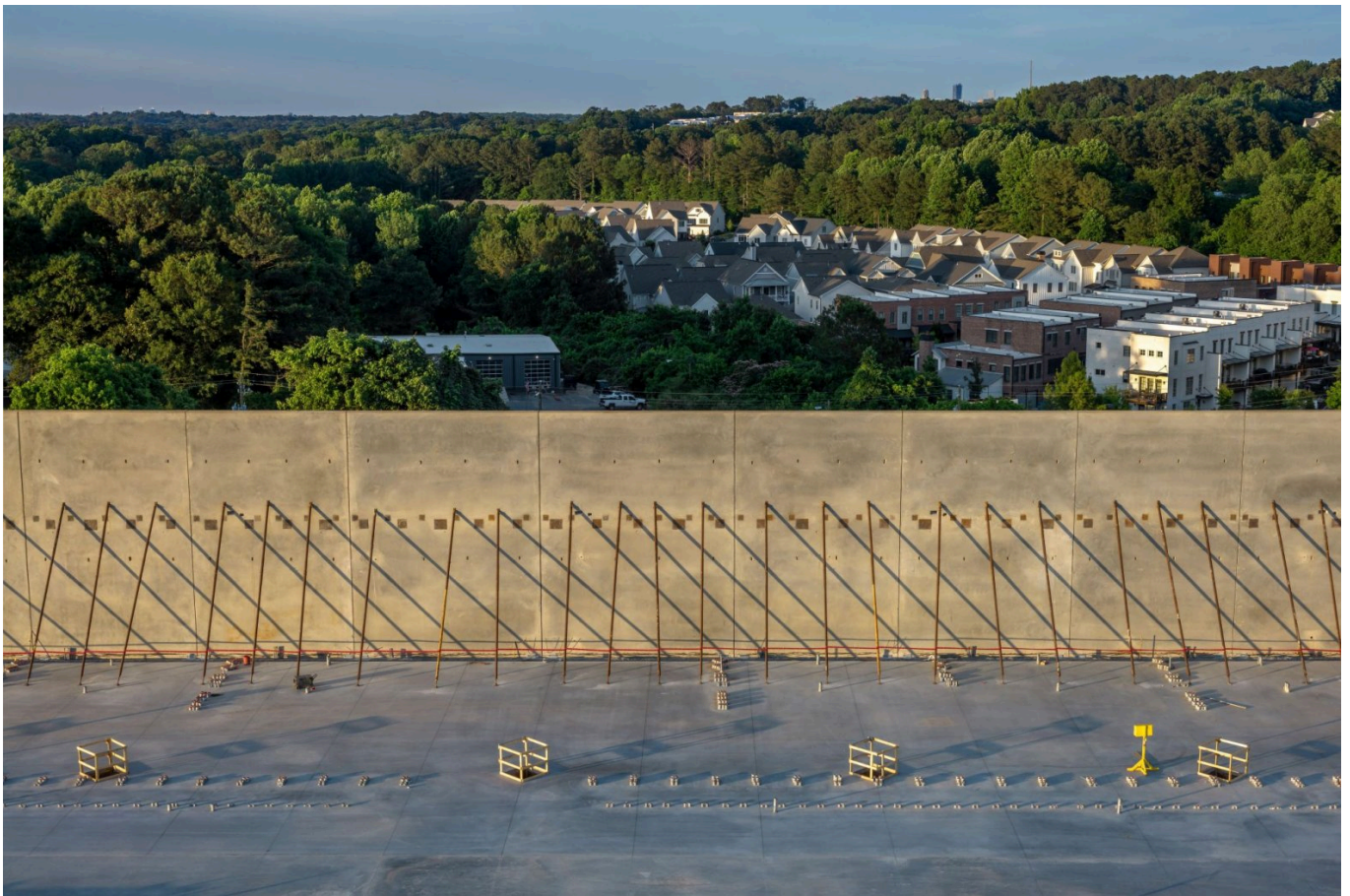
6) Reducing pressure on marginalized communities

Emerging analyses suggest that some data center siting patterns could compound long-standing environmental and economic challenges. A national [review](#) of roughly 700 data centers across the country found that nearly half are in census tracts with above-median environmental burdens, such as air pollution, park access and water pollution, as measured by the Center for Disease Control's Environmental Justice Index. Many were located in areas with social vulnerability indicators, such as poverty and lower education levels.

State level assessments show similar concerns. In [California](#), existing and planned data centers appear more frequently in areas of high air pollution. In [South Carolina](#), new facilities and the fossil-fuel generation built to power them are often sited near Black and low-income communities.

More research is needed to fully understand these trends. Yet preliminary findings underscore the importance of ensuring that new data center development does not reinforce existing inequities.

Several practices can help communities and local governments navigate the trade-offs of data center siting. The [NAACP's Frontline Framework Community Guiding Principles](#), offers practical strategies to ensure data centers are planned and built in ways that protect health and equity. In addition, [NAACP's Community Benefits Agreement template](#) helps communities and decision-makers advance transparency, accountability and shared governance in data center development.



Construction of a data center near homes in Atlanta, Ga. Developers and governments need to plan data centers with care to ensure they do not put pressure on communities, especially those already facing environmental and social disparities. Photo by Cavan Images/Alamy

7) Balancing economic trade-offs

Data center development can create real economic opportunities. Their construction generates hundreds of well-paying — though temporary — jobs for technicians, electricians and other local building trade workers. There are also good-paying opportunities for full-time staff, like technicians, security staff and facility managers. At Google’s data center in central Ohio, [salaries range from](#) about \$74,000 for a data center technician to more than \$160,000 for an operations manager. Yet these positions are fairly limited. A [review](#) of more than 1,200 U.S. data centers found that even the largest employ fewer than 150 permanent workers, and sometimes as few as 25.

Summary of Governance Tools to Mitigate Data Center Impacts on Communities

Energy

- Dedicated rate classes for large energy users.
- Cost-recovery safeguards.

Water Protection

- Water-use monitoring and public disclosure.
- Drought contingency planning.
- Reclaimed wastewater use.

Air

- Replacing diesel with battery storage.
- Emissions review during permitting.
- On-site clean power requirements.

Land-Use Planning

- Agricultural zoning protections.
- Performance standards for noise, traffic and buffering.

Equity and Community Voice

- Community benefits agreements.
- Transparent siting criteria.
- Limiting use of NDAs.
- Public disclosure of resource demands.

Data centers also generate revenue for local or state governments through property, sales and use taxes. A recent [national](#) estimate found that total government revenues associated with the data center sector increased from \$66 billion in 2017 to more than \$162 billion in 2023. However, many states and cities offer sizable tax incentives to attract data centers, meaning the actual gain can be far smaller than projected.

These benefits must be weighed against long-term public costs, including investments in water systems, electrical substations, transmission lines, roads and emergency services. Water and electric infrastructure often remains in place for around 30 years. If a data center downsizes or relocates before these costs are recovered, communities may be left paying for infrastructure sized for a facility that no longer exists.

Communities and local governments can call for stronger financial analysis, clear rules for cost recovery, and more transparency about infrastructure demands to help

ensure that both host communities and companies see economic benefits from new data centers.

What Governments Can Do to Lessen Data Centers' Impacts

As data centers proliferate, local concerns are mounting. More than \$64 billion in projects were delayed or canceled between May 2024 and March 2025 due to organized [opposition](#).

Threats to communities are not an inevitable outcome of data center development; they're the result of decisions made by developers, local governments and other stakeholders. Yet even as community involvement grows, major governance gaps persist.

Many developers enter non-disclosure agreements (NDAs) with local officials, which can limit public access to information about project scale, resource needs and potential impacts. A [review](#) of 31 Virginia municipalities with existing or proposed data centers found that 25 (80%) had NDAs in place. At the [federal level](#), new permitting policies have accelerated approvals for large data center projects, shortening environmental review timelines and reducing opportunities for local input.

In response, some local governments are beginning to develop stronger tools to support negotiations with developers. Some local governments, like [Jerome Township](#), Ohio, have imposed temporary moratoria, pausing approvals for new data centers to reassess siting criteria and community safeguards. Prince George's County, Md., created a [data center task force](#) to study siting criteria and procedural protections. In Lancaster, Pa., city leaders approved a [community benefits agreement](#) which directs the developer to use clean energy to power the facility; mitigate noise; support local employment programs; and deliver \$10 million each for economic development and advancing Lancaster climate and community goals.

Together, these efforts reflect an emerging understanding: **How data centers are governed will determine whether communities benefit from the digital economy — or bear the brunt of its risks.** Ultimately, whether data centers deliver shared prosperity or reinforce existing inequities will hinge on policies and processes that

fully include community priorities alongside government and developer decision-making.

Research support for this article was provided by Jada Turner, a Park Scholar and Honors student at North Carolina State University.

1 Total U.S. data center count as of Jan. 21, 2026. This count includes operational, planned, land banked, and under construction data centers. Source: Datacentermap.com

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