



A Review of Information on the Impacts of Data Centers

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OLO Report 2026-15

Executive Summary

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The Council requested this report to better understand the potential impacts of building data centers in the County. This Office of Legislative Oversight (OLO) report summarizes publicly available information and data about impacts on the local economy, energy demand, environment, quality of life, and racial equity and social justice in jurisdictions that have authorized the building of data centers. The report also reviews the laws, regulations, and zoning requirements in jurisdictions where data centers have been built and describes opportunities to mitigate potentially negative impacts.

Data Center Demand

Data centers house networks of servers that store, manage, and process digital information. Data centers have been around for decades and provide critical infrastructure for the internet, streaming services, global communications, and business transactions, among other uses. Currently, demand for data centers is growing by 20 percent annually due to increased internet traffic, widespread cloud storage use, and rapid adoption of artificial intelligence (AI) models that require significant computing power.

The U.S. contains approximately 5,000 of the world's 11,000 data centers, with the United Kingdom and Germany hosting the next largest numbers, at around 500 each. Northern Virginia is currently the world's largest data center hub, called "Data Center Alley," with over 500 centers in Loudoun, Fairfax, and Prince William Counties. Montgomery County currently has four data centers: two in Silver Spring, one in Germantown, and one in Rockville. Two are large, detached data centers and two are co-located within office buildings and lease out space to third-party entities.

Types of Data Centers

- **Enterprise:** Privately owned by organizations to support their internal IT systems and applications.
- **Co-Location Data Centers:** Rent server space, power, and connectivity to businesses.
- **Edge Data Centers:** Smaller facilities located close to end-users to increase processing speed.
- **Hyperscale Data Centers:** House thousands of servers to meet needs of large tech companies.

Data center types vary in their size and energy use. Data centers, especially large ones, require continuous electrical power, precise cooling of equipment, secure infrastructure, and reliable network connectivity to function. If any of these systems fail, the servers can shut down.

Data centers are often described in terms of how much energy they draw in a given moment. Smaller edge data centers may use around 100 kilowatts (kW) to two megawatts (MW) of electricity. A hyperscale data center may use 50 MW or more. For context, one megawatt of electricity can power about 500-1,000 U.S. homes in a given moment. In 2024, U.S. data centers used 192 terawatt-hours (TWh) of electricity, about 4.7 percent of U.S. energy consumption in that year. One terawatt equals one million megawatts and is enough energy to power 500 million to one billion homes.

Economic and Fiscal Impacts of Data Centers

Systematic empirical evidence on data centers' local economic impacts is limited, though OLO identified a small, growing body of rigorous studies—using methodologies capable of establishing causal impact—on jobs, wages, business activity, housing, and electricity prices. Local economic impacts have been highly uneven and contingent on local conditions, facility characteristics, and timing of when investments were made.

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- **Job Creation.** Counties with data centers see clear gains in specialized data-processing jobs and short-term construction employment boosts, but data centers create far fewer permanent local jobs than comparably costly manufacturing plants, resulting in modest overall county-level employment effects.
 - **Metro vs. Nonmetro:** County-level gains in employment, total wages, and building permit activity have been concentrated in metropolitan counties, with little or none for non-metro counties.
 - **Clustering Facilities:** Counties adding data centers within five years of the first facility had larger increases in employment, wages, establishments, and building permits than counties with a single data center.
 - **Operator Type:** Hyperscale facilities generated larger local gains in employment, wages, and businesses than smaller data centers, implying weaker evidence of strong impacts from smaller-scale investments.
 - **Entry Timing:** Areas that built data centers early saw clearer gains in county-level employment, wages, and businesses. Areas building post-2020 have seen negligible effects from diminishing returns or lack of time for benefits to materialize.
 - **Housing Prices:** Large data centers have lowered nearby home prices, with effects that persist for years and become stronger as jurisdictions host more facilities. Housing price impacts faded with distance and are smaller when data centers are built in industrial or commercial zones rather than residential ones.

Impacts on Energy Prices

PJM Interconnection, L.L.C. coordinates the regional high-voltage transmission grids and operates wholesale electricity markets serving Montgomery County and Northern Virginia. Rapid data-center growth and tight electricity supply are driving up energy prices for Maryland customers. Supply is constrained by retiring plants, slow construction of new generation, and limited investment, so prices are expected to stay high without outside intervention.

Environmental Impacts of Data Centers

Electricity Use. Data centers are heavily straining U.S. electric grids, with PJM projecting their power use to triple from 2024 to 2029. Interconnection delays are severe, averaging five years nationally and more than eight years within PJM, further limiting grid capacity.

Water Use. Data centers consume large volumes of water for cooling, power generation, and equipment manufacturing, with Northern Virginia facilities alone using nearly two billion gallons in 2023. This rising demand is contributing to regional concerns about future water availability.

Air Pollution. Data centers generate significant air pollution because most of their electricity comes from fossil fuels. Byproducts of electricity generation include carbon dioxide, sulfur dioxide, particulate matter, and heavy metals. Data centers already account for 2.2% of U.S. carbon dioxide emissions, and at current growth rates could add the equivalent of 5–10 million cars' emissions by 2030, with backup diesel generators further worsening local air quality.

Water Pollution. Fire systems and some data center cooling systems use PFAS, "forever chemicals," that may be released in the environment. Cooling systems also may release salt, magnesium, sulfate, and potassium into the environment, which can contaminate groundwater supplies and cause reactions in humans.

Climate Change. Data center operations contribute to greenhouse gas emissions and construction can lead to loss of agricultural land and woodlands, all of which contribute to climate change. As temperatures rise due to climate change, data centers' demand for electricity and water for operation and cooling will increase, putting further strain on the environment and the supply of electricity and water.

Impacts on Areas Adjacent to Data Centers

Data centers can create visual and noise disruptions for nearby neighborhoods due to their size, height, and constant mechanical humming. Their large land requirements also lead companies to target sites near natural areas, recreational spaces, and farmland.

Racial Equity and Social Justice (RESJ)

Because of environmental racism and racial inequities in areas like economic stability, health, and housing, community members experience various impacts of data centers differentially by race and ethnicity. BIPOC communities are particularly susceptible to being overburdened by cumulative impacts from data centers – including increasing air pollution, utility costs, and public health burdens – while receiving limited economic development benefits. Seeing familiar patterns of environmental racism across the country, RESJ leaders, advocates, and organizers have identified the rapid expansion of large-scale data centers as the next major front of the Environmental Justice Movement.

Local Regulations in Other Jurisdictions

Local governments use diverse strategies to regulate data center development, often requiring more stringent review for large facilities while allowing simpler processes for smaller or accessory-use data centers. Across the Washington region, jurisdictions rely on combinations of by-right approvals, conditional approvals, special exceptions, and overlay districts. Many also implement standards for energy and water use, efficiency, and infrastructure, such as clean energy requirements, closed-loop cooling, and decommissioning plans.

Maryland State Regulation of Data Centers

A legislatively mandated analysis of likely environmental, energy, and economic impacts of data center development in Maryland is due to the Maryland General Assembly and governor by September 1, 2026. Maryland law exempts personal property from state sales and use tax for qualified data centers, and counties can reduce or eliminate property taxes for personal property. Montgomery County has not done so.

Maryland's 2026 Utility RELIEF Act defines "large load" business electricity customers as businesses with an aggregate monthly demand of 25 MW—which includes larger data centers. Additional regulations for these large load customers will include higher electricity rate schedules, paying costs associated with electrical grid connection/use, and reporting data on energy use, water use, and backup generation to the Public Service Commission, which will publish it in aggregated, anonymized form.

Recommendations for Council Consideration

Recommendation #1. As the Council evaluates legislation and zoning text amendments related to building and operating data centers in Montgomery County, it should consider various approaches that can potentially mitigate adverse fiscal, economic, environmental, neighborhood, and RESJ impacts.

- **Data Center Overlay Zones** – consider the benefits and drawbacks of establishing a data center overlay zone for the County to address geographic, environmental, and community goals and align future siting decisions with infrastructure capacity.
- **Location Requirements** – consider limiting new data centers to industrial zones with at least a 0.5-mile buffer from homes and ensure these locations do not disproportionately impact nearby BIPOC communities already facing environmental and social burdens.

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- **Regulations Based on the Size of Data Centers** – examples include differentiating between large- and small-scale data centers by energy use, square footage, or a combination of the two; requiring a more in-depth review process or possible prohibitions for larger data centers.
 - **Regulations on Data Center Design and Operation** – options include limits on allowable backup generators and their use, noise-reduction requirements, outdoor lighting standards, battery storage requirements, maintaining a specific Power Use Effectiveness, or adjusting computer power during peak periods for better efficiency.
 - **“Bring Your Own” Clean Energy** – requirements could include data centers supplying a percent of their annual electricity demand from on-site generation or contracted, dedicated off-site renewable energy generation.
 - **Limiting Water Use** – options include requiring less consumptive cooling methods, such as closed-loop water systems, immersion cooling, or using recycled or non-potable water for water cooling systems.
 - **Reporting Data** – consider requiring all data centers in the County to publicly disclose data on their facilities and operations. Examples include data related to energy use, water consumption, heat release, water discharge, backup energy systems, and emissions.
 - **Racial Equity and Social Justice Assessments** – consider requiring Racial Equity and Social Justice assessments as a part of the development review process for data center projects to evaluate how data centers could affect neighborhood-level cumulative impacts (environmental and social stressors), County-level outcomes by race and ethnicity, and to develop an individualized, community-driven mitigation plan.
 - **Non-Compliance Fines** – consider adopting a detailed and progressive fine structure for data centers not compliant with established codes and standards that goes towards a fund for mitigating negative RESJ impacts.
 - **Decommissioning Plans** – consider requiring data center applications include decommissioning plans that describe how the data center would be removed or adapted by the operator, both logistically and financially, at the end of its useful life.

Recommendation #2. When considering laws or zoning amendments for data centers or approvals for specific data center projects, the Council could require steps that solicit and incorporate feedback from affected community members, groups, and organizations. The Council could also establish a Data Center Oversight Board to advise them on policies related to data centers, development applications, compliance monitoring, and RESJ impacts.

Recommendation #3. The Council could consider using tools such as Community Benefit Agreements (CBAs) to require data center entities to reduce negative impacts and create benefits for the community.

Recommendation #4. If the Council permits the building of data centers in Montgomery County, it could work with the Executive Branch to ensure County Government departments and other relevant entities have the legal authority, data infrastructure, and staff capacity to monitor and enforce requirements established for building and operating data centers, such as energy consumption, water usage, noise, and emissions standards.

Recommendation #5. The Council could encourage the Maryland General Assembly to amend state law to require all existing large load customers in the state register with and disclose information to the Public Service Commission.

Recommendation #6. The Council could assess whether data centers merit project-specific tax incentives or additional taxation. Emerging research shows that data centers can boost local employment, wages, and business formation, but they can also impose costs on third-parties: noise, visual, and environmental externalities; strain on local infrastructure and electricity systems; and, in some cases, reduced nearby home values.

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Introduction

The County Council requested this report to better understand the potential impacts of building data centers in Montgomery County. The Council asked the Office of Legislative Oversight to review publicly available information and data about the effects seen in other jurisdictions that have authorized the building of data centers. The Council is interested in whether any best practices have emerged for building and operating data centers. Montgomery County currently hosts four data centers: two in Silver Spring, one in Germantown, and one in Rockville. Two are large, detached data centers and two are co-located within office buildings and lease out space to third-party entities.

Many state and local governments are looking for ways to balance the benefits and drawbacks of data centers. This raises several questions: Can data centers bring economic benefits to a community? What are the potential downsides of approving one? How can downsides be reduced? This report reviews available information and data on the impacts of building data centers and describes opportunities to mitigate potentially negative impacts.

Data centers are centralized physical facilities that house information technology (IT) infrastructure including servers, storage systems, and networking equipment, which are used to store, manage, and process digital information. Data centers are critical infrastructure for the internet, streaming services, global communications, and more. People interact with data centers every day through typical online activities like email, streaming, and online shopping. Northern Virginia is currently the world's largest data center hub, with over 500 data centers.

A large-scale data center is a highly engineered complex with massive computing halls housing servers, extensive cooling and power systems, and sophisticated networking infrastructure to ensure constant availability. It typically includes redundant electrical grids, backup generators, water or air-based cooling plants, and physical security layers such as gated perimeters and controlled access zones.

Large data centers typically require large amounts of electricity and water to operate continuously, often drawing as much power as small towns and using between one and five million gallons of water a day for cooling purposes. A significant body of research analyzes different impacts from data centers, including environmental impacts, racial equity and social justice impacts, economic impacts, and localized impacts on areas where data centers are located. This report summarizes information from research and current literature on data centers, particularly in the United States.

Project Scope and Report Structure. This report contains the following chapters:

- **Chapter 1, Data Centers Overview** describes data centers and their growth in the United States. The chapter also summarizes Maryland law impacting data centers and includes information about data centers in the region.

- **Chapter 2, Data Centers: Economic and Fiscal Impacts** summarizes research on local economic impacts of data centers.
- **Chapter 3, Data Centers: Impacts on Energy Prices** describes the impacts of energy supply and demand from data centers on Montgomery County and the broader state.
- **Chapter 4, Environmental Impacts of Data Centers** describes how data centers have impacts on the environment through water and energy use and its effects upon agriculture, green spaces, and climate change by examining data at the national, state, and local level.
- **Chapter 5, Quality of Life and Neighborhood Impacts** describes the ways data centers can impact quality of life for neighboring communities, including viewsapes, light pollution, noise pollution, and access to green spaces and recreation.
- **Chapter 6, Data Centers and Racial Equity and Social Justice** describes local and national context on environmental justice and the impact of large-scale data centers on racial equity and social justice.
- **Chapter 7, Regulating Data Centers at the Local Level** reviews laws, regulations, and zoning requirements in jurisdictions where data centers have been built and identifies best practices regarding the building and operation of data centers.
- **Chapter 8, Findings** includes OLO’s findings.
- **Chapter 9, Recommendations** includes OLO’s recommendations.

Methodology. OLO staff members Janmarie Peña, Stephen Roblin, Leslie Rubin, Kaitlyn Simmons, and Will Yetvin conducted this study with assistance from OLO staff members Karen Pecoraro, Blaise DeFazio, and Kristen Latham and OLO interns Clara Donowitz and Adonia Mesfin. To prepare this report, OLO gathered information through document review and literature review.

Applying a Racial Equity and Social Justice Lens to OLO Report 2026-15. In 2019, the County Council established the Racial Equity and Social Justice (RESJ) Act.¹ This law directs County departments and offices to apply a RESJ lens to their work. RESJ is a process that focuses on centering the needs, leadership, and power of Black, Indigenous, and People of Color (BIPOC). RESJ is also a goal of eliminating racial and social inequities. To apply a RESJ lens, OLO pays attention to race, ethnicity, and other social constructs when analyzing problems, looking for solutions, and defining success. We recognize this is necessary to fulfill our mission and advance RESJ in Montgomery County. In this report, OLO applies a RESJ lens by including a chapter that describes research on the RESJ impacts of data centers, and highlights data on racial inequities and racial disparities in Montgomery County. The Findings and Recommendations chapters incorporate the RESJ information in the report.

¹ Montgomery County Office of Legislative Oversight, [Racial Equity and Social Justice Impact Tools](#).

Chapter 1. Data Centers Overview

The County Council requested this report to better understand the potential impacts of building data centers in Montgomery County. The Council asked the Office of Legislative Oversight to review publicly available information and data about effects seen in other jurisdictions that have authorized the building of data centers. The Council is interested in whether any best practices have emerged for building and operating data centers. This report does not include specific recommendations for Montgomery County. The report reviews available information and data on the impacts of building data centers and describes opportunities to mitigate potentially negative impacts.

This chapter provides an overview of information relevant to development of data centers.

- **Section A** defines what a data center is and describes the different ways data centers are categorized (e.g., based on purpose, size, etc.);
- **Section B** describes current growth trends in data centers in the U.S.;
- **Section C** summarizes current laws in Maryland that apply to data centers;
- **Section D** describes data centers in the region;
- **Section E** describes the review of data centers in other jurisdictions; and
- **Section F** describes coordination in the region surrounding data centers.

The Maryland General Assembly and the Governor are currently awaiting an analysis of the likely environmental, energy, and economic impacts of data centers in the state which is due September 1, 2026. The analysis is being conducted by the Maryland Department of the Environment (MDE), the Maryland Energy Administration (MEA), and the University of Maryland (UMD) School of Business.¹ (See section D.4)

A. Definition and Characteristics of Data Centers

Data centers are centralized physical facilities that house information technology (IT) infrastructure including servers, data storage systems, and networking equipment used to store, manage, and process digital information. Data centers are critical infrastructure for internet, streaming services, global communications, and business transactions, among other uses.²

People interact with data centers every day through typical online activities like email, streaming, and online shopping. Data show that global demand for data centers has grown by 20 percent each year

¹ [House Bill \(HB\) 720](#), MD General Assembly (2025).

² [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), Congressional Research Service (May 12, 2026); [What is a Data Center? Meaning, Definition, Operations & Types | Fortinet](#)

(doubling every four to five years) due to increased internet traffic, widespread cloud storage use, and the rapid adoption of artificial intelligence (AI) models that require significant computing power.³

Data centers, especially large ones, require continuous electrical power, precise cooling of equipment, secure infrastructure, and reliable network connectivity to function. If any of these systems fail, the servers can shut down.⁴

In 2024, the U.S. Department of Commerce estimated U.S. housed 5,000 data centers.⁵ Northern Virginia is currently the world's largest data center hub, with over 500 centers in Loudoun, Fairfax, and Prince William Counties.⁶ Data from early 2026 estimate almost 11,000 data centers worldwide, with Great Britain and Germany hosting the next largest numbers, at around 500 each.⁷

Data centers are categorized in several ways, based on purpose, energy usage and size, and reliability.

1. Based on Purpose

There are four generally recognized types of data centers based on their purpose and use:⁸

- **Enterprise (On-Premises) Data Centers:** Privately owned and operated by organizations to support their internal IT systems and applications. Often located on company premises, they provide complete control over infrastructure and security.
- **Managed and Co-Location Data Centers:** A co-location data center allows businesses to rent space, power, cooling, and connectivity while hosting their equipment. This shared model reduces operational costs. It is common among businesses that do not want to manage physical infrastructure but need some control over their servers and storage.
- **Edge Data Centers:** Smaller facilities typically located closer to end-users to reduce latency and improve performance. Edge data centers support applications requiring real-time processing, including internet-connected devices (e.g., smart TVs, speakers, or thermostats), 5G networks, and autonomous vehicles.

³ E. Krygiel, [What's Fueling the Data Center Boom? 5 Key Industry Insights](#), BOMA International, May 21, 2025.

⁴ MEP Academy, [How Data Centers Work: Power, Cooling, and Infrastructure Explained](#), March 16, 2026.

⁵ [Request for Comments on Bolstering Data Center Growth, Resilience, and Security](#), 89 Fed. Reg. 71,890 (Sept. 4, 2024).

⁶ J. Zografos, [Data Center Alley: How Ashburn became a data center hub of the world](#), Digital Reality, January 7, 2025.

⁷ N. Conte, [Mapped: The World's Data Centers by Country](#), Visual Capitalist, Feb. 18, 2026; [Data Center Statistics in US 2026: Data Center Facts](#), The World Data, Apr. 9, 2026.

⁸ M. Dillon, [The Basics of Data Centers: What You Need to Know](#), Quest Technology Management, February 12, 2025; P. Powell & I. Smalley, [What Is a Hyperscale Data Center?](#), IBM. The fifth type are Cloud Data Centers, operated by cloud service providers like Amazon Web Services (AWS), Google Cloud, and Microsoft Azure. According to Quest Technology Management, cloud data centers are virtual environments where businesses can store, process, and access data without managing hardware. Cloud data centers enable flexibility and rapid deployment but may involve ongoing subscription costs.

- **Hyperscale Data Centers:** Built for massive scalability using thousands of servers, hyperscale data centers are designed to meet the needs of large tech companies like Facebook and Amazon. They use highly efficient architecture to handle enormous workloads used to run artificial intelligence and machine learning models.

2. Based on Energy Use and Size

Data center types vary in their size and energy use. Data centers are often described in terms of how much energy they draw in a given moment to operate. For example, smaller edge data centers may use around 100 kilowatts (kW) to 2 megawatts (MW) of electricity at any given moment. A hyperscale data center may use 50 MW or more of electricity at any given moment.

For context, **one megawatt** of electricity can power about 500 to 1,000 U.S. homes in a given moment. **One gigawatt** (GW) equals 1,000 megawatts and can power the energy demand of a major U.S. metropolitan area at a given moment. A typical nuclear reactor produces approximately **one gigawatt** of electricity at any moment. **One terawatt (TW) is equal to 1,000 gigawatts.** Energy usage over time is described in hours. For example, a 50 MW data center running for one hour uses 50 megawatt-hours (MWh) of energy.

In 2024, U.S. data centers used 192 terawatt-hours (TWh) of electricity, accounting for 4.7 percent of U.S. energy consumption in that year.⁹

3. Based on Reliability

Data centers are grouped into tiers based on how they are designed and how reliable they are. A key factor is redundancy, which involves having duplicate parts such as power sources or cooling units so the data center can keep running if something fails. The goal is to maximize uptime, defined as the percentage of time a data center remains continuously operational. The [Tier Classification System](#), developed by the Uptime Institute, is the most widely used framework for assessing a data center's capabilities and performance. The four tiers are:¹⁰

⁹ S. Smith, [United States Data Center Energy Usage Report: 2025 Update](#), Lawrence Berkeley National Laboratory, at p. 7 (June 2026); R. Leppert, [What we know about energy use at U.S. data centers amid the AI boom](#), Pew Research Center, Oct. 24, 2025; [Brookings report](#)

¹⁰ M. Dillon, [The Basics of Data Centers: What You Need to Know](#), Quest Technology Management; S. Susnjara & I. Smalley, [What Is a Data Center?](#), IBM.

Tier I: Basic Redundancy

- **What it means:** Uses basic redundancy capacity components, such as uninterruptible power supply (UPS) and 24x7 cooling.
- **Uptime:** About 99.67%, which equals 28.8 hours of downtime per year.
- **Best for:** Small organizations with basic IT needs.

Tier II: Additional Redundancy

- **What it means:** Adds more power and cooling subsystems—such as generators and energy storage devices—to improve safety against disruptions.
- **Uptime:** ~99.75% (22 hours of downtime per year).
- **Best for:** Medium-sized organizations with advanced IT and reliability needs.

Tier III: Concurrently Maintainable

- **What it means:** Avoids shutdowns when equipment needs maintenance or replacement.
- **Uptime:** ~99.98% (1.6 hours of downtime per year).
- **Best for:** Organizations requiring high reliability, such as financial institutions.

Tier IV: Fault Tolerant

- **What it means:** Delivers the highest redundancy and fault tolerance level, ensuring continuous operation even during multiple failures. Requires continuous cooling to keep the environment stable.
- **Uptime:** ~99.99% (0.4 hours of downtime per year).
- **Best for:** Organizations with critical operations, such as healthcare and government.

B. Overview of Data Center Growth in the U.S.

Data center growth in the U.S. has exploded. This growth is fueled primarily by increased use of artificial intelligence (AI).¹¹ In past decades, data centers provided cloud storage services and hosting platforms for organizations. The recent construction boom is providing infrastructure to host generative AI and other AI tools that require significant computing power.¹²

Northern Virginia’s “Data Center Alley” in eastern Loudoun County “has the highest concentration of data centers in the world with approximately 250 data centers built and more than 100 in the development pipeline,” according to a white paper by Loudoun County Vice Chair/Ashburn Supervisor

¹¹[Data Center Statistics in US 2026: Data Center Facts](#);

¹²[The future of data centers | Brookings](#); [13979](#)

Mike Turner.¹³ The proliferation of data centers in the D.C. region and elsewhere significantly impacted the communities that host them.

The primary impacts stem from massive amounts of electricity and water now needed to operate data centers, local impacts of this usage, and other local impacts related to the proximity of data centers. A little over 50 percent of data center electricity demand is for IT equipment, while cooling technology accounts for approximately 40 percent.¹⁴ Researchers estimate hyperscale data centers will consume between 16 and 33 billion gallons of water by 2028.¹⁵

Among other things, data centers have been shown to:

- Increase the cost of electricity for ratepayers;
- Stress electrical grids that lack the capacity to provide the energy that data centers require in addition to the needs of the rest of the electrical grid;
- Have modestly positive, yet uneven, impacts on employment, wages, income, and business growth in jurisdictions with data centers;
- Depress home prices for homes near some data centers with effects that persist for years;
- Create short-term construction jobs and specialized data processing jobs, with wage, business, and housing price impacts highly variable and contingent on local conditions;
- Deplete local water supplies that provide local drinking water and water for recreational uses;
- Impact the quality of air, water, and undeveloped land and contribute to climate change;
- Impact areas adjacent to data centers through light and noise pollution.

Data centers also raise racial equity and social justice (RESJ) and environmental justice concerns related to their impacts on Black, Indigenous, and other People of Color (BIPOC) and people with low incomes.

State and local jurisdictions have begun implementing laws and regulations to mitigate some negative impacts of data centers. At the same time, there is rapid evolution in data center technology that also mitigates some of the negative impacts—in the technology used in data centers, in data center infrastructure such as cooling technology, in energy transmission infrastructure, etc. These topics are discussed in the following chapters.

¹³ M. Turner, [Loudoun County, Virginia: Data Center Capital of the World](#), June 1, 2026, page 2.

¹⁴ [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), CRS; [Source](#),

¹⁵ K. Silverstein, [America's AI Boom Is Running Into An Unplanned Water Problem](#), Forbes (Jan. 11, 2026).

Overview of Data Center Energy Use in Our Region. In 2024, U.S. data centers used 192 terawatt-hours (TWh) of electricity, accounting for 4.7% of U.S. energy consumption that year.¹⁶ A 2024 report from the Lawrence Berkeley National Laboratory documents data center energy use increasing at an accelerated rate, growing approximately 7 percent from 2014 to 2018, 18 percent from 2018 to 2023, and further increasing 13-27 percent between 2023 and 2028.¹⁷ In the 2025 update to this report, researchers estimate that data centers energy usage could constitute between 9.5 percent and 15.3 percent of total U.S. energy usage by 2030.¹⁸

As noted above, the U.S. is home to over 5,000 data centers.¹⁹ Currently, researchers estimate the U.S. accounts for about 54% of all hyperscale data center capacity worldwide.²⁰ Staff at MIT's Lincoln Laboratory Supercomputing System project that by 2030, AI will account for 21 percent of all electricity usage across the world.²¹

Data centers in our region are connected to an electric grid managed by [PJM Interconnection, L.L.C. \(PJM\)](#), which coordinates the movement of wholesale electricity through all or parts of [the District of Columbia and 13 states](#)—Delaware, Illinois, Indiana, Kentucky, Maryland, Michigan, New Jersey, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.

Based on historical data, PJM estimated in 2021, its net growth in energy load over 25 years increased by 7%, an average annual compound growth rate of roughly 0.27%. (PJM Interconnection, '[2025 Load Forecast Tables](#),' PJM RTO Historical Net Energy (GWh), 1998–2023.) On that basis, PJM's [2021 long-term forecast](#) assumed growth of about 0.3% per year over the following decade.

In 2026, PJM [revised](#) its long-term load forecasts sharply upward due to the rapid growth of data center load. In its latest [2026 forecast](#), PJM now expects over the next 10-year period for:

- Net energy load growth to average 5.3% per year;
- Summer peak load growth to average 3.6% per year; and
- Winter peak load growth to average 4.0% per year.

¹⁶ S. Smith, [United States Data Center Energy Usage Report: 2025 Update](#), Lawrence Berkeley National Laboratory, at p. 7 (June 2026) (note that the data in the report do not include energy used for mining cryptocurrency).

¹⁷ A. Shehabi, et al., [2024 United States Data Center Energy Usage Report](#), Lawrence Berkeley National Laboratory, at p. 7 (Dec. 2024).

¹⁸ [United States Data Center Energy Usage Report: 2025 Update](#), at p. 5.

¹⁹ [Data Center Statistics in US 2026: Data Center Facts](#), The World Data, Apr. 9, 2026

²⁰ [Hyperscale Data Center Count Hits 1,136; Average Size Increases; US Accounts for 54% of Total Capacity | Synergy Research Group](#)

²¹ [AI has high data center energy costs — but there are solutions | MIT Sloan](#)

These all represent more than ten-fold increases in projected growth rates compared to PJM’s 2021 predictions. In a July 2026 auction, the 138,318 MW of electricity that PJM was able to secure for future use was 6,831 MW below what was needed to meet reliability requirements.²²

However, capacity supply in the grid is structurally constrained. One major issue with supply is the time it takes for new sources of energy to connect to the grid. Data show in 2025 it took energy suppliers an average of five years in the U.S. from a request to connect to the electricity grid to commercial operations.²³ Data specific to the PJM grid show the average time for interconnection is over eight years.²⁴ Data show “that as of the end of 2025, more than 2,060 gigawatts of generation and storage capacity were actively seeking grid connection nationwide which [would] more than double the country's entire installed generating capacity.”²⁵

In October 2025, the U.S. Department of Energy (DOE) directed the Federal Energy Regulatory Commission (FERC) to speed up the process of interconnecting large energy users, such as data centers, to the energy grid.²⁶ FERC, which regulates the interstate electric grid, issued an order in June 2026 finding PJM’s tariff related to large energy users was “unjust and unreasonable.”²⁷

In this context, a tariff means a published, official schedule of prices and rules governing how a regulated service is priced. It does not refer just to the price schedule for the energy. PJM’s Open Access Transmission Tariff includes requirements and processes that govern connecting new users to the electric grid.²⁸

FERC determined that PJM’s tariff cannot adequately handle the surge of new electricity customers trying to connect to the grid. It ordered PJM to respond within 60 days to explain why its current rules are sufficient or propose ways to fix the issue. PJM was directed to address:

- Making the application and study process for new large power users clearer and faster;
- Making sure data centers help pay for grid upgrades their presence requires, rather than passing those costs onto regular residential customers; and

²² [PJM Capacity Auction Procures 138,318 MW of Generation Resources as Work Continues To Address Growing Electricity Demand](#), PJM Inside Lines (July 14, 2026).

²³ J. Rand, et al., [Queued Up: 2026 Edition](#), Lawrence Berkeley National Laboratory, at p. 4 (June 2026).

²⁴ A. Weeks, et al., [PJM’s Speed to Power Problem and How to Fix It](#), RMI (Nov. 4, 2025).

²⁵ N. Coelho, [How Long It Actually Takes to Power a Data Center in 2026: A U.S. Market-by-Market Reality Check](#) (July 1, 2026).

²⁶ [Secretary Wright Acts to Unleash American Industry and Innovation with Newly Proposed Rules](#), U.S. DOE (Oct. 23, 2025).

²⁷ [Order Instituting Proceeding Under Section 206 of the Federal Power Act](#), Docket No. EL26-67-000, Federal Energy Regulatory Commission (Jun. 18, 2026). FERC made similar findings for and instituted similar proceedings against five other U.S. regional grid operators.

²⁸ [PJM Open Access Transmission Tariff](#) (Sept. 17, 2010). Parts IV and VI primarily describe the process for a developer to apply for connection and associated requirements.

- Clarifying rules for data centers that want to team up with, or build, their own power plants next to their facility.

PJM's response is due mid-August 2026, and FERC must approve any changes to PJM's tariff schedule.

C. Maryland State Regulation of Data Centers

This section describes Maryland laws related to data centers. The Maryland Code defines a data center as “a building or group of buildings used to house computer systems, computer storage equipment, and associated infrastructure that businesses or other organizations use to organize, process, store, and disseminate large amounts of data.”²⁹

The Maryland General Assembly has adopted several pieces of legislation related to data centers, including:

- A required impact study on data centers by state agencies and the University of Maryland by September 1, 2026;
- Exempting qualified data centers from state sales and use taxes for personal property;
- Allowing counties to exempt data centers from local personal property taxes; and
- Defining and redefining the definition of a “large load customer” in Maryland, which classifies businesses based on the amount of electricity they use and imposing certain requirements on large load customers.

Statewide Impact Study. In 2025, the Maryland General Assembly adopted legislation requiring the MDE and MEA to work with the University of Maryland (UMD) School of Business and Maryland Department of Legislative Services to conduct and release an analysis of the likely environmental, energy, and economic impacts of data center development in the state. The report is required to be submitted to the Governor and the General Assembly by September 1, 2026.³⁰ The governor originally vetoed the legislation requiring the impact study. The General Assembly overrode the veto in a special session in December 2025.

1. Maryland Sales and Use Tax Exemption

Maryland law exempts personal property from state sales and use tax for qualified data centers.³¹ Adopted in 2020, companies must apply for and be granted the exemption by the Department of Commerce (DOC). Personal property exempt from sales and use tax includes computer equipment, air conditioning and mechanical systems, and equipment related to energy generation and use.

²⁹ MD Code Ann., Tax – General [§ 11-239\(a\)\(2\)](#).

³⁰ [House Bill \(HB\) 720](#), MD General Assembly (2025).

³¹ MD Code Ann., Tax – General [§ 11-239](#).

Data centers can qualify for the exemption if they are in the state and within three years of applying for the exemption:

- A data center in a Tier I area invests at least \$2 million in qualified personal property and creates at least five qualified positions; or
- A data center in any other area of the state invests at least \$5 million in qualified personal property and creates at least five qualified positions.

Montgomery County is not a Tier I County in this context.³²

A determination of eligibility must be renewed annually by the DOC and cannot be renewed for more than 10 consecutive years. If the company invests \$250 million in qualified personal property, eligibility can be renewed for up to 20 consecutive years.³³

2. County Personal Property Tax Exemption

Maryland law allows a county to adopt laws reducing or eliminating the assessment of tax for personal property used in a qualified data center.³⁴ Montgomery County has not adopted a law of this type.

3. Utility RELIEF Act of 2026

The General Assembly adopted this in part to bring down energy rates for ratepayers in the short run.

a. Defining Large Load Customers

In Maryland, a “large load customer” is a business customer for electricity service that has a high monthly demand for electricity, which can include some data centers. The General Assembly adopted the definition of a large load customer in the 2025 Next Generation Energy Act, setting the definition based on a company’s monthly electricity demand and load factor.³⁵ The load factor measures how efficiently and steadily a facility uses electricity. The law states: “It is the intent of the General Assembly that residential retail electric customers in the State should not bear the financial risks associated with large load customers interconnecting to the electric system serving the State.”³⁶

In the 2026 legislative session, the General Assembly reduced the metrics in state law that define a large load customer – reducing the aggregate monthly demand for electricity from 100 megawatts to

³² See MD Code Ann., Economic Development [§ 1-101\(g\)](#).

³³ MD Code Ann., Tax – General [§ 11-239\(d\)](#).

³⁴ MD Code Ann., Tax – Property [§ 7-248](#).

³⁵ [House Bill 1035](#), MD General Assembly (2025). A “load factor” is a ratio of a facility’s average electricity usage compared to their peak electricity usage and provides a measure of how steadily and consistently a facility uses electricity.

³⁶ MD Code Ann., Public Utilities [§ 4-212\(b\)](#).

25 megawatts and reducing the load factor from 80% to 60%. A load factor of 60%-80% is considered high. As of July 1, 2026, a large load customer under Maryland law is a:

[C]ommercial or industrial customer for retail electric service that: (1) has or is projected to have an aggregate monthly demand of at least 25 megawatts; and (2) has or is projected to have a load factor of more than 60%.³⁷

Under the laws adopted in 2025 and 2026, large load customers have additional requirements related to state registration, funding of infrastructure, and cost of electricity.

b. New Electricity Rate Schedules for Large Load Customers

By September 1, 2026, investor-owned utility companies in Maryland must establish an electricity rate schedule specific to large load customers and submit it to the Public Service Commission (PSC).³⁸ With a few exceptions, large load customers will not be permitted to receive service under any other rate schedule. Before approving a utility company's large load rate schedule, the law requires the PSC to consider whether the rate schedule allocates "just and reasonable costs" to large load customers, taking into account costs to build out infrastructure specific to large load customers.³⁹ The law states that "[i]t is the intent of the General Assembly that residential retail electric customers in the State should not bear the financial risks associated with large load customers interconnecting to the electric system serving the State."⁴⁰

c. Large Load Customer Costs

New in 2026, the Utility RELIEF Act requires large load customers to bear costs attributable to their use of electricity, including certain transmission and capacity costs and costs associated with connecting the large load customer to the electrical grid.⁴¹ The Act also directs the PSC to create a voluntary large-load interruptible interconnection service, which typically refers to allowing large load customers "to connect to the grid faster if they agree to not pull [electricity] from the grid during peak demand hours."⁴²

³⁷ [House Bill 1532](#), MD General Assembly (2026), citing MD Code Ann., Public Utilities [§ 7-232\(e\)](#) (2026). HB 1532 moved the definition of a large load customer to a new section of the Maryland Code (see p. 72). A large load customer does not include water or sewage disposal companies, manufacturing facilities, hospitals, district energy systems, agricultural facilities, or "another industrial facility" at the discretion of the Commission. Ibid. § 7-232(e)(2).

³⁸ MD Code Ann., Public Utilities [§ 4-212\(d\)](#).

³⁹ Ibid. at § 4-212(d), (e).

⁴⁰ Ibid. at § 4-212(b).

⁴¹ [House Bill 1532](#), citing MD Code Ann., Public Utilities § 4-212(d)(3), (e) (see p. 35-37).

⁴² J. DeMarco, [Every Single Thing in the Utility Relief Act](#), Maryland Energy Talk (Apr. 14, 2026).

d. Required Registration with Public Service Commission

The Maryland PSC oversees public utility and transportation services in Maryland. The PSC regulates gas, electric, telephone, water, and sewage disposal companies.⁴³ The Utility RELIEF Act requires the PSC to create a registry of large load customers before July 1, 2027 applicable to new or expanded interconnections of large load customers.⁴⁴ Large load customers will be required to register with the PSC within 30 days of signing a FERC – Jurisdictional Agreement, a contract that outlines information related to customers rates, terms, and conditions that energy companies must file with FERC.⁴⁵

Large load customers will be required to provide the PSC a variety of data, including:

- Information about ownership and lease status of the location;
- The location of the interconnection and the customer’s address;
- Information on the customer’s operation;
- Energy data such as peak load, anticipated load factor, and annual energy usage;
- The nature of on-site backup electricity generation;
- Monthly water use and the source of water used;
- Duplicative interconnection requests; and
- Information on applications to the MDE or water utilities for water appropriation or use.⁴⁶

The PSC must report annually aggregated and anonymized information from large load customers for each electric company’s service territory.⁴⁷ Information related to specific customers will be available “by a Public Information Act request after the project has become operational.”⁴⁸

e. Clean Capacity Rating Program

The Utility RELIEF Act requires the PSC to develop a voluntary “Clean Capacity Rating Program” that provides platinum or gold ratings for large load customers that bring new clean electricity capacity.⁴⁹ “The energy sources that can count toward clean capacity are: Battery storage (either on site or on the local grid), new non-emitting generation assets, a virtual power plant, and a demand response program.”⁵⁰

Large load customers that receive a rating will be prioritized for interconnection to the grid. Platinum customers receive a guarantee their related permit applications will be processed within 12 months of

⁴³ “About,” Maryland Public Service Commission.

⁴⁴ [House Bill 1532](#), citing MD Code Ann., Public Utilities § 7-233 (see p. 74).

⁴⁵ *Ibid.* § 7-233(c) (see p. 76).

⁴⁶ *Ibid.* § 7-233(b)(2)(ii) (see p. 74-77).

⁴⁷ *Ibid.* § 7-233(j) (see p. 79-80).

⁴⁸ J. DeMarco, [Every Single Thing in the Utility Relief Act](#).

⁴⁹ [HB 1532](#), citing MD Code Ann., Public Utilities § 7-234 (see p. 80-83); J. DeMarco, [Every Single Thing in the Utility Relief Act](#).

⁵⁰ J. DeMarco, [Every Single Thing in the Utility Relief Act](#); see also [HB 1532](#), citing MD Code Ann., Public Utilities § 7-232(d).

submission. Platinum customers can pay for and build substations required to connect the customer to the electrical grid.⁵¹

4. Other Laws and Regulations That May Impact Data Centers

In Maryland, data centers can be subject to additional state laws, regulations, and reviews, especially when they draw substantial energy from the electrical grid. The state's Public Service Commission oversees utility companies, and the Department of the Environment oversees certain parts of data center construction and operation.⁵² Examples of additional regulation include:

- Permits and oversight of stormwater runoff, new impervious surface, dust control, and groundwater impacts;
- Restrictions and requirements if the site is a brownfield site (i.e., site with history of contamination from prior industrial activity);
- Permits related to the Clean Air Act for locations with diesel backup generators; and
- State permits that set water withdrawal limits under the Clean Water Act.

This oversight addresses several ways data center construction affect jurisdictions, as described in the following chapters.

D. Information about Data Centers in the Region

This section briefly describes data centers located in Maryland, Montgomery County, and Northern Virginia.

1. Data Centers in the Region

Maryland is home to about 53 data centers of varying sizes, according to the industry-run [Data Center Map](#). Frederick County contains 22 data centers while the City of Baltimore and Baltimore County combined contain 18 data centers. Montgomery County currently has four data centers: two in Silver Spring, one in Germantown, and one in Rockville. Two are large, detached data centers and two are co-located within office buildings and lease out space to third-party entities.⁵³

Montgomery County's largest data center is a 214,000 square foot Tier IV data center located on a 10-acre site at 12401 Prosperity Drive in White Oak/Silver Spring. This facility was built in 2009 and sold in 2025 for \$29 million to the Sansone Group.⁵⁴ At the time of writing the facility is adjacent to multifamily apartments and condominiums, a pediatric and adolescent care center, a public storage

⁵¹ [HB 1532](#), citing MD Code Ann., Public Utilities § 7-234(e) (see p. 81-83).

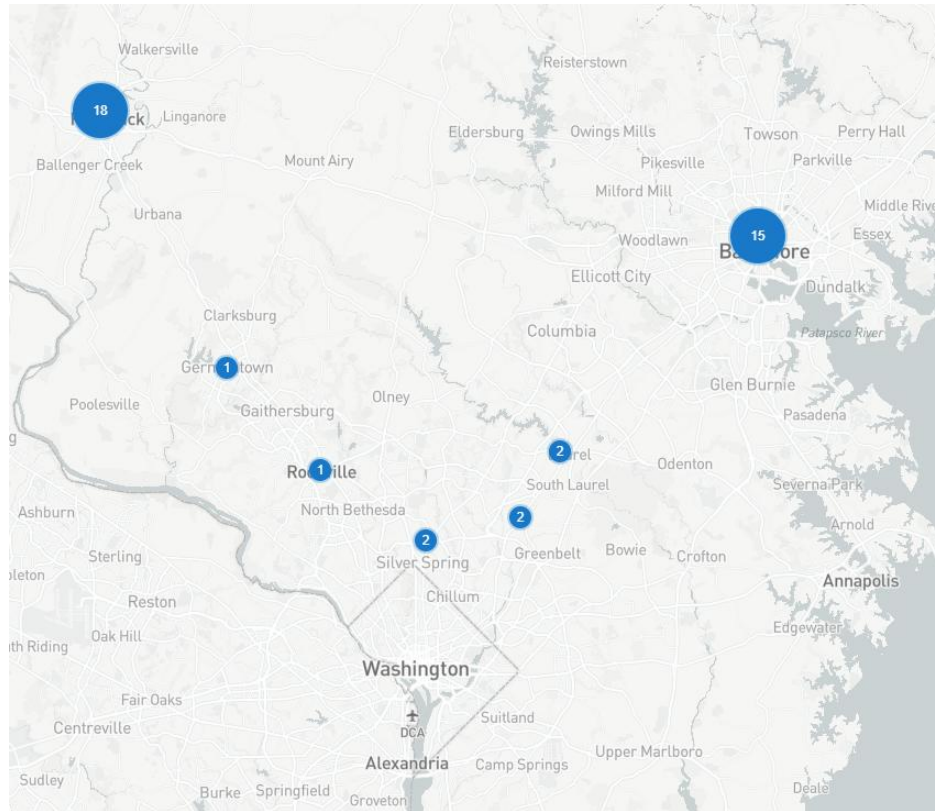
⁵² [Data Centers](#), Maryland Department of the Environment.

⁵³ *Ibid.*

⁵⁴ [Montgomery County Data Center Sells For \\$29 Million - The MoCo Show](#), August 16, 2025.

facility, and fast-food restaurants. The second largest data center is a Tier III 114,000 square foot facility on a 14-acre site at 20441 Century Boulevard in Germantown.⁵⁵

Figure 1-1. Map of Data Centers in Montgomery, Prince George's, Frederick, and Baltimore Counties



Source: datacentermap.com as of June 9, 2026. Map includes data centers that are operational, planned, land-banked, or under construction.

Virginia dwarfs Maryland in number of data centers, with 609 facilities according to the same Data Center Map. As noted above, Northern Virginia is a hub for large data centers because two of the central exchange points of global internet infrastructure are in Ashburn and Vienna. Facilities on this “Data Center Alley” benefit from being close to these internet exchange points, which are essential for high-speed, high-volume data transfers.⁵⁶

At the time of writing, the Northern Virginia data center market reports a little under a one percent vacancy rate with rising demand for hyperscale facilities that can handle the enormous data processing requirements associated with artificial intelligence (AI).⁵⁷ As of early 2026, residents in Ashburn, VA’s Regency neighborhood were being offered \$4.4 million per acre to sell to data center developers.⁵⁸

⁵⁵ DataCenterMap.com, [Maryland Data Centers](https://datacentermap.com). Montgomery Planning, [Attachment C](#), January 2026.

⁵⁶ J. Zografos, [Data Center Alley: How Ashburn became a data center hub of the world](#), Digital Reality, January 7, 2025.

⁵⁷ [Montgomery County Data Center Sells For \\$29 Million - The MoCo Show](#), August 16, 2025.

⁵⁸ InsideNoVa.com, [Ashburn residents offered over \\$4M per acre for data centers](#), March 23, 2026.

2. Status of Data Center Construction in Montgomery County

In 2024, Terra Energy submitted a plan to build a 360 MW hyperscale data center and battery energy storage facility on the site of a decommissioned coal fired power plant in Dickerson, which is located in the County's Agricultural Reserve.⁵⁹ If approved, the California-based company Atmosphere Data Centers would construct a Tier III+ data center on 170 acres.⁶⁰ An accompanying energy storage facility adjacent to the site would provide 2,000 MW of electricity storage.⁶¹

In January 2026, the County District Council introduced a zoning text amendment to permit data centers by conditional use only in Industrial Zones.⁶² Effective June 12, 2026, County Executive Marc Elrich issued Executive Order 109-26 that placed a six-month moratorium on the Department of Permitting Services (DPS) considering and processing applications for data centers to allow the Council:

Adequate time and opportunity to fully consider, deliberate, and address the potential impact of Data Centers, including but not limited to: existing and future local energy demands; negative impacts to the surrounding environment, including wetlands, streams, rivers, flood plains, or environmentally sensitive areas; negative impacts to parks and recreational facilities; the visual impact on surrounding properties; and appropriate measures to mitigate such impacts.⁶³

As discussed in Section C.1 above, the Executive Order notes the State of Maryland anticipates an impact assessment on the impact of data centers across the state to be completed by September 1, 2026. The moratorium will be in effect until mid-December 2026.

On Wednesday, July 22, 2026, the Council's Economic Development (ECON) Committee reviewed two data center moratorium bills ([Bill 19-26](#) and [Bill 24-26](#)) that propose moratoriums for issuing permits related to data center for six months and for two years. The Committee voted to recommend an 18-month moratorium to the Council. Also on July 22, the Planning, Housing and Parks (PHP) Committee reviewed [Zoning Text Amendment \(ZTA\) 26-01](#), which includes a definition of data centers and would preclude their use in the County, consistent with the ECON Committee's vote on a moratorium. These decisions will come before the Council on July 28, 2026.

3. Montgomery County Government Use of Data Centers

Montgomery County rents data center space from Equinix, a Tier IV data center located in Ashburn, VA.⁶⁴ The data center is the hub for FiberNet, the County's flagship fiber-optic communications

⁵⁹ Montgomery Planning, [Dickerson Power Plant Conditional Use No. CU202413 and Forest Conservation Plan No. F20240620](#).

⁶⁰ Atmosphere Data Centers, [Dickerson, MD Data Center](#).

⁶¹ Ibid.

⁶² See C. Wellons, [Zoning Text Amendment \(ZTA\) 26-01, Commercial Uses – Data Center](#).

⁶³ [Montgomery County Executive Order 109-26](#) (June 12, 2026).

⁶⁴ Montgomery County, [Montgomery County Selected as Finalist for 2023 U.S. Broadband Award for Technical Infrastructure](#), October 30, 2023.

network. Fibernet enables the delivery of communication services for all County agencies, traffic cameras and signals, Montgomery County Public Schools (MCPS), Montgomery College, Housing Opportunities Commission (HOC), the Maryland-National Park and Planning Commission (M-NCPPC), and WSSC Water.⁶⁵ According to the County’s IT Adviser, the County has limited data storage space in Rockville and most of the County’s digital information is sent to and from the Ashburn data center.⁶⁶

E. Jurisdictional Reviews of Data Centers

Like Montgomery County, state and local jurisdictions across the country are reviewing the impacts of data centers. This section describes some of these reviews.

Several Maryland counties have created task forces to study the impact of data center development. Task forces are compiling information to inform legislation and provide recommendations on building location and design standards. The Frederick County Data Centers workgroup [published its report in March 2024](#). The Prince George’s County Data Center Task Force [published its report on November 2025](#).

In July 2026, the Prince George’s County Council approved a two-year moratorium on new data center development.⁶⁷ The Howard County Council passed a temporary pause on new data center development until November 2027 so it can appoint a task force to study the issue. Baltimore County and Baltimore City have had similar discussions.⁶⁸ In June 2026, the Harford County Council unanimously voted to ban the construction of data centers anywhere in the suburban county located northeast of Baltimore.⁶⁹

In Virginia, the state’s Joint Legislative Audit and Review Commission [published a comprehensive report on Data Centers in 2024](#), which assesses many of the same economic, climate, and residential impacts of data centers as this report, and offers an array of policy options and recommendations. In 2026, the Vice Chair of Loudoun County’s Board of Supervisors [published his own white paper](#) on Loudoun’s “strategy for a changing paradigm” in the data center capital of the world. The paper explains critical issues and offers best practices for communities considering data centers.

In 2025, Loudoun County’s Board of Supervisors eliminated by-right development of data centers. Applicants in Loudoun County must now obtain special exception approval, which requires legislative review and public hearings before the County Planning Commission and the Board of Supervisors.⁷⁰

States across the country are considering whether to preempt local governments by passing moratoriums on data center development. In June 2026, the New York State Senate and Assembly

⁶⁵ Montgomery County, [FiberNet - Office of Broadband Programs](#)

⁶⁶ OLO interview with Montgomery County Council IT Adviser, February 17, 2026.

⁶⁷ J. Domen, [Two-year moratorium on data center development passes in Prince George’s Co.](#), WTOP News, July 7, 2026.

⁶⁸ J. Babb, [Howard County Council passes temporary pause on new data center development](#), Fox45 News, June 2, 2026.

⁶⁹ R. Campbell, [Harford County becomes first in Maryland to ban data centers](#), WBAL-TV, June 10, 2026.

⁷⁰ Holland & Knight, [Loudoun County, Virginia, Eliminates By-Right Data Center Development](#), April 4, 2025.

passed the Responsible Data Center Development Act (S10642) that put a one-year pause on new permits for data centers with more than 20 megawatts (MW) of capacity.⁷¹

Statewide legislation on data centers is also being passed in states with Republican controlled legislatures. In May 2026, Florida Governor Ron DeSantis signed [SB 484](#), with the intent of protecting “ratepayers, the environment, and local communities from harm caused by hyperscale data centers.”⁷² According to the National Conference of State Legislatures, lawmakers in 14 states have introduced legislation to propose or consider bans and moratoriums.⁷³

F. Regional Coordination in Washington Metropolitan Area

Recognizing that local governments are exploring how to regulate data centers, in 2026 the Metropolitan Washington Council of Governments (MWCOG) held a three-part series on energy, water, land use, and the economics of data centers. The events brought together area elected officials, government agency staff, industry leaders, and subject matter experts to coordinate regional planning on data centers with the goal of balancing economic growth while safeguarding the long-term reliability of grid infrastructure and natural resources that cross jurisdictional boundaries.⁷⁴

Regional coordination around the Potomac River is important because cumulative demands on water supply from data center projects combined with variable precipitation levels over time, may pose risks to the region’s water supply. Coordination amongst data centers and utility companies to upgrade electric power transmission lines and develop backup and load management protocols can help reduce the likelihood of power outages that could impact critical sectors like emergency response, Washington Metropolitan Area Transit Authority (WMATA), and healthcare facilities.⁷⁵

Development of public mapping and development tracker tools can help policymakers plan and keep community members informed on current and future data center developments. [Loudoun County’s Existing & Proposed Data Centers Map](#) shows the location of requested, approved, and existing data center parcels and substations within the county. The information is updated every six months. The [Prince William County Mapper](#) allows users to see data center projects at every stage of development and overlay environmental, utility, or public service locations like schools onto the map.

⁷¹ D. Levin, [New York Lawmakers Pass One-Year Permitting Ban for New Data Centers](#), Industrial Info Resources, June 08, 2026.

⁷² Executive Office of the Governor, [Governor Ron DeSantis Signs Law to Protect Floridians from Subsidizing Data Centers](#), May 7, 2026.

⁷³ Ibid.

⁷⁴ Metropolitan Washington Council of Governments, [5 key takeaways from the Data Center Series so far](#), March 17, 2026.

⁷⁵ Ibid.

Chapter 2. Data Centers: Economic and Fiscal Impacts

This chapter reviews the best available empirical research on local economic and fiscal effects of data centers published through mid-2026, with a focus on quasi-experimental studies and related high-quality analyses that inform policy trade-offs for local decisionmakers.

A. Methodology for Literature Review

For this analysis, OLO conducted a literature review focusing on the local economic impacts of data centers. The review is informed by standards in evidence-based policymaking practice consistent with federal and Maryland guidance on policy and program evaluation.

One of the highest forms of evidence comes from systematic reviews of research literature on specific topics. A systematic review uses explicit methods to locate and select primary studies on a clearly defined question, critically appraises the methodological quality of these studies, and systematically synthesizes their findings to identify where results converge and where they diverge.¹ Systematic reviews (and other, less structured literature reviews) can be valuable tools for evidence-based policymaking by providing decisionmakers with an overview of the current state of knowledge on a particular topic.

As of mid-2026, there is no comprehensive review of research on the local economic impacts of data centers.² Most existing research focuses on data centers' energy use, cooling methods, gas emissions, water pollution, etc.³ Research on the economics of data centers is limited, but rapidly growing. Most high-quality studies are currently available as working papers or preprints published mainly between 2023 and 2026 and available on research repositories such as Google Scholar, Social Science Research Network (SSRN), and National Bureau of Economic Research (NBER).

Given the state of the field, OLO performed a targeted search for empirical studies on the local economic impacts of data centers and synthesized their findings. The approach taken here is consistent with federal and Maryland guidance that treats **randomized control trials (RCTs)** and **quasi-experimental studies** as strong evidence for policy impacts.⁴ (For definitions and illustrations, see "Data Centers and Research Design" below.) Rather than performing a more comprehensive overview

¹ Guides.temple.edu, [Systematic Reviews & Other Review Types](#); Perićić and Tanveer, "[Why systematic reviews matter.](#)"

² Daniel Yue and Yiyang Zeng, "[The Local Economic Effects of Data Center Entry](#)," SSRN Scholarly Paper no. 6497238 (Social Science Research Network, March 30, 2026).

³ Michael Rubinovitz, "[Here Comes the Cloud: The Effect of Data Centers on Homeowners in Northern Virginia](#)," SSRN Scholarly Paper no. 6136790 (Social Science Research Network, January 26, 2026).

⁴ "[Definition of Evidence-Based and Levels of Evidence](#)," Maryland State Department of Education; Angela Henneberger, "[Program Evaluation in the Absence of Randomization: How Can Propensity Score Methods Help?](#)," Maryland Longitudinal Data System (MLDS) Center, June 5, 2018.

of policy papers and other less rigorous analyses on the topic, this search focused on identifying studies with methodologies capable of producing valid findings on the causal impacts of data centers.

Unlike certain policy interventions amenable to random assignment, major private sector capital investments like data centers are not randomly located. Instead, firms chose to develop data centers “in places with favorable infrastructure, energy access, permitting conditions, tax incentives, expected growth, and other local advantages.”⁵ To address the non-random selection of data centers, researchers have adopted quasi-experimental methods to study their local economic impacts.

Data Centers and Research Design

Randomized controlled trials (RCTs) are widely considered the “gold standard” of causal analysis. In an RCT, eligible participants or locations are randomly assigned to receive a new program (“treatment”) and researchers compare changes in outcomes between the treatment and participants/locations that have not received the new program (“control”). To illustrate:

- Randomly assigning eligible locations to construct a data center (the treatment group) or to continue without a data center for a defined period (the control group). Researchers could then compare changes in outcomes—such as employment, housing prices, household income—between treatment and control locations to estimate the impacts of data centers. This evidence would provide a strong empirical basis to conclude that the impacts are due to the data centers and not other factors.

When random assignment is not feasible, as in the case of data centers (see above), researchers can use **quasi-experimental methods** to approximate a comparison group. Quasi-experimental designs use observational data to construct “as-if random” treatment and comparison groups—for example, by exploiting eligibility rules, timing, or other features of program implementation—without true random assignment. Two common methods are matching and instrumental variable. To illustrate:

- **Matching methods** may pair counties that have a data center with similar counties that do not, based on observable characteristics such as metropolitan status, pre-entry employment levels, and infrastructure. By comparing changes in outcomes between these matched county pairs, evaluators aim to isolate the effect of the data centers from other differences between counties.
- **Instrumental variable** methods use a proxy—an “instrument”—that would predict data center siting but is plausibly unrelated to local economic outcomes, *except through the presence of a data center*. A valid instrument affects whether and where data centers locate but has no direct impact on the outcome variables of interest. By comparing changes in outcomes across locations with different levels of exposure to the instrument, evaluators can isolate the causal effect of data centers on those outcomes.

Source: Paul J. Gertler et al. (2016), [*Impact Evaluation in Practice, Second Edition*](#), Washington, DC: Inter-American Development Bank and World Bank.

⁵ Fernando E. Alvarez et al., “[Data Centers and Local Economies in the Age of AI: A Shift–Share Approach](#),” Working Paper no. 35194, Working Paper Series (National Bureau of Economic Research, May 2026).

Using Google Scholar, SSRN, and NBER, OLO conducted a literature search that prioritized U.S.-based empirical studies with quasi-experimental designs that were posted between 2010 and 2026. The search resulted in the empirical studies presented in **Table 2-1** below.

This analysis also considers fiscal considerations surrounding data centers, including how they are taxed at the federal, state, and local levels; how tax incentives and abatements are structured; and how these choices affect local revenues, spending, and borrowing in the short run. It draws primarily on the policy reports and empirical studies on data center taxation and incentives identified in **Table 2-2**.

Table 2-1. Empirical Studies on Local Economic Impacts of Data Centers

Study	Description	Scope (geography & time)	Main outcome domains
Alvarez et al. (2026)	NBER working paper that examines how data center development across U.S. counties affects local economies at the county level. It compares counties where data center revenue grew more to counties where it grew less, using county tax, electricity, business, and facility-level data to estimate effects on employment, income, house prices, and electricity prices	U.S. counties, 1995–2020	• Labor market – total, data processing, construction employment; wages; income • Business activity – establishments, payroll • Third-party impacts – house prices, electricity prices
Yue and Zeng (2026)	SSRN working paper that examines how data center entry across U.S. counties affects local economies at the county level. It compares counties where data centers become operational to counties without data center entry, using county level employment, wage, household income, unemployment, and building permit data linked to facility level information	U.S. counties, 2000–2024	• Labor market – employment, wages, unemployment, household income; • Business activity – establishments, building permits • Third-party impacts – electricity prices)
Rubinovitz (2026)	SSRN working paper examines how data centers in Loudoun County, Virginia have affected nearby home prices. It compares homes within 0.5 miles of a data center with homes 0.5–2 miles away, using residential property sale data, county assessment records, and facility-level data to estimate effects on sale prices, assessed values, rents, and time-to-sale	Loudoun County, VA housing parcels, 2014–2024	• Third-party impacts – house prices, assessed values, rents, time-to-sale
Chia et al. (2026)	SSRN working paper that examines how hyperscale and other large data center openings across U.S. locations affect nearby housing markets at the property level. It compares homes in near rings (typically within 5 km of a facility) to homes 20–50 km away or near later-treated sites, using nationwide housing transaction records, facility-level technical data, and local utility and land-use information to estimate effects on house prices, utility costs, and related incidence channels	U.S. housing parcels near data centers, 2000–2025	• Third-party impacts – house prices, utility costs

Table 2-2. Studies on Data Centers and Taxation

Source	Description
Tax Foundation (2025)	Policy report that analyzes how state and local tax systems treat data centers across U.S. jurisdictions. It compares tax treatment and effective tax rates of 12 data centers across multiple states, using a stylized \$1 billion data center and combining state and local sales, property, tangible personal property, and income taxes to assess fiscal burdens and the role of targeted incentives.
Gargano and Giacoletti (2026)	SSRN working paper that examines how U.S. state tax incentives for data centers between 2000 and 2025 affect where and how much data center infrastructure is built, with a focus on large cloud and AI facilities. It compares states that have adopted data center–specific tax incentives to states that do not, using facility-level development data and state tax incentive statutes.
Jaros (2025)	Working paper that examines how county-level tax abatements used to attract data centers affect local government and sector-specific output across 44 counties in 20 U.S. states. It compares counties that provide data center tax abatements to counties without such abatements, using county-level administrative and financial data to estimate short-run effects on government output, sectoral GDP, and public finances.

B. Economic Findings

There is still limited systematic empirical evidence on the local economic impacts of data centers despite a small but growing set of rigorous studies on jobs, wages, business activity, housing, and electricity prices.

Although research on the economics of data centers is growing, as of mid-2026, there is no comprehensive review of the economic research on data centers that has been conducted so far. As economists Daniel Yue and Yiyang Zeng write, “systematic empirical evidence on how data center entry affects local jobs, incomes, and public finances remains almost entirely absent.”⁶ The lack of systematic evidence is particularly problematic from a policymaking perspective, given the economic and fiscal trade-offs policymakers face when deciding whether to permit data center expansion within their jurisdictions and, if so, whether to incentivize this activity.

1. Labor Market and Business Impacts

This section synthesizes findings on labor market and business impacts of data centers from two recent national quasi-experimental studies:

- Alvarez et al. (2026) compare U.S. counties where data center revenue grew more over 1995–2020 to counties where it grew less; and
- Yue and Zeng (2026) compare U.S. counties from 2000 to 2024 where data centers became operational to counties without entry.

The findings are presented at a higher level because the percentage estimates are not always straightforward to interpret for a general audience. Therefore, findings are presented in terms of whether effects on employment, wages, household income, and business establishments were large, modest, or limited. For readers who want the precise magnitudes, a summary table in this section reports the key coefficients for each study.

a. Effects on Workers

Counties with data centers have experienced clear gains in employment of specialized data-processing workers, along with short-term increases in construction jobs. However, data centers have generated far fewer permanent local jobs than similarly costly manufacturing plants, and overall employment effects at the county level have been modest. Data centers’ employment benefits have also been uneven across counties, with some locations seeing meaningful gains and others negligible change.

⁶ Daniel Yue and Yiyang Zeng, “[The Local Economic Effects of Data Center Entry](#),” SSRN Scholarly Paper no. 6497238 (Social Science Research Network, March 30, 2026).

- **Specialized data processing jobs:** Across the U.S., Alvarez et al. find that counties where data center revenue grew more experienced persistent increases in data processing employment. However, operational data centers usually employ only a modest on-site workforce—between 30 and 100 permanent staff for typical facilities, with employment at some very large hyperscale campuses reaching the low hundreds.⁷
- **Short-term construction jobs:** Building a large data center often takes multiple years, though timelines can vary by project, permitting requirements, and other conditions. The process begins with preparing the site and building the shell, followed by installing electrical infrastructure and cooling systems, and finally deploying servers. This construction phase creates *temporary* demand for local construction workers, electricians, HVAC technicians, and related trades.⁸ In their empirical study, Alvarez et al. find that, across the U.S., data center projects were associated with short-term increases in construction employment while facilities were being built.
- **Mixed evidence on total employment:** In addition to creating ongoing data processing jobs and short-term construction jobs, data centers could induce broader employment gains. Nationwide, both studies find that data center expansion or entry was associated with modest increases in total county employment. However, Alvarez et al. find that the positive total-employment effects weaken and become statistically insignificant when they account for within-state differences in total employment. Additionally, Yue and Zeng find that data centers' impacts on total employment were highly conditional, with employment gains larger in metropolitan counties, Big Tech-owned facilities, and counties that attract multiple centers, and find negligible employment effects in many rural counties or those with only one facility.
- **Comparison with manufacturing plants:** Both studies observe that while data centers are highly capital-intensive, they employed far fewer permanent workers than manufacturing plants with similar construction and critical infrastructure costs. Yue and Zeng caveated their findings on the employment effects of data centers accordingly: "Our smaller effects likely reflect the fundamental difference between data centers and manufacturing: a \$500 million data center employs perhaps 50 permanent workers, while a comparably sized manufacturing plant might employ 2,000." Thus, the evidence indicates that data center impacts on local employment have been much smaller than those documented for large manufacturing plants.

⁷ Yue and Zeng, "The Local Economic Effects of Data Center Entry". See also Hamm Institute for Economic Research, [Data Center Employment Forecast Analysis](#) (Hamm Institute, 2025); Phill Powell and Ian Smalley, "What Is a Hyperscale Data Center?" IBM Think, March 20, 2024; and Irina Ivanova, "Data Center Frenzy Is Spurring a Jobs Boomlet for Blue-Collar Workers," *CBS News*, May 28, 2026

⁸ Yue and Zeng, "The Local Economic Effects of Data Center Entry." See also Goetzel, Daniel, Mark Muro, and Shriya Methkupal. [Turning the Data Center Boom into Long-Term, Local Prosperity](#). Brookings Institution, 2026.

- **Unemployment:** Despite gains in employment, Yue and Zeng found that county-level unemployment rates fell only modestly after data center entry, with estimated declines small compared with the changes in jobs and uneven outcomes across counties.

Counties with data centers have seen modest increases in average wages and median household income. But as with the findings on employment, these wage and income gains have been uneven across counties, with some locations seeing larger increases in these indicators than others.

- **Wages:** Both studies find that data centers increased county-level wages, compared to similar counties without data centers or with much lower exposure. Alvarez et al. and Yue and Zeng each report economically meaningful wage gains in counties with data centers, even though overall employment effects were more modest and uneven. Across both studies, wages increased more than employment, which is consistent with data centers bringing in relatively higher-paying jobs and raising average earnings even though job counts grew only modestly.
- **Household income:** The studies also find data centers increased household income, compared to similar counties with little or no data center activity. Yue and Zeng show that building a data center raised median household income in those counties, relative to counties that did not have a data center. Alvarez et al. document broader gains in adjusted gross income in counties with higher data center revenue growth than those with less.

b. Effects on Businesses

Counties with data centers have experienced modest increases in local business establishments, though the scale of these gains is smaller than for comparable manufacturing investments. As with other indicators, increases in business establishments have been uneven across counties, with some locations seeing more pronounced growth than others.

- **Business establishments:** Both studies find data centers are linked to more local firms. Alvarez et al. show counties where data center revenue grew more experienced increases in the number of business establishments across horizons. Yue and Zeng similarly estimate that building of a data center raised the number of business establishments over the first three years after entry.

c. Contextual factors shaping local impacts

Local economic impacts from data centers have been highly uneven and contingent on local conditions, facility characteristics, and timing when the investments were made.

Yue and Zeng (2026) find that the economic effects of data centers have been highly varied across locations:

- **Metro vs. nonmetro:** Gains in employment, total wages, and building permit activity at the county-level have been concentrated in metropolitan counties, with little or no statistically significant change in these indicators for non-metro counties.
- **Clustering of facilities:** Counties that received additional data centers within five years of their first entry experienced substantially larger increases in employment, wages, establishments, and building permit activity than counties with isolated entries, suggesting early clustering has amplified local economic benefits.
- **Operator type:** Big Tech hyperscale facilities have generated larger local gains in employment, wages, and business establishments than third party or enterprise data centers, implying weaker evidence of strong impacts from smaller scale investments.
- **Entry timing:** Earlier first-entry cohorts (data centers built pre-2010 and 2010–2019) have experienced clearer gains in employment, wages, and business establishments, whereas the post-2020 cohort has shown negligible or statistically insignificant effects so far, suggesting either diminishing returns or that there has not been enough time for benefits to materialize in the post-2020 cohort.

These patterns help explain why average effects have been modest, but some counties have seen much larger gains than others.

Table 2-3. Summary of County-Level Employment, Wage, Income, and Establishment Effects in Alvarez et al. (2026) and Yue & Zeng (2026)

Outcome	Yue & Zeng (treated vs non-treated counties)	Alvarez et al. (more-data center revenue growth vs less growth)
Total employment	≈3.5% higher over medium run	≈3.9% higher per unit of exposure
Total wages	≈5.0% higher over medium run	≈5.9% higher wages
Household income	≈1.9% higher median household	≈8.2% higher adjusted gross income
Business establishments	≈4.7% more establishments over medium run horizon	Positive increases in establishment counts

Note: Percentages refer to differences in county aggregates over the authors' study horizons (treated vs non-treated, or more-data center revenue growth vs less growth), not to individual workers' pay.

2. Third-Party Impacts

This section describes findings on impacts of data centers on homeowners and renters from two recent quasi-experimental studies. Both studies investigate how data centers affect nearby housing prices and related outcomes, with the first focusing on a single high-exposure county and the second on nationwide hyperscale openings.

- Rubinovitz (2026) compares homes within 0.5 miles of a data center to homes 0.5–2 miles away in Loudoun County, Virginia from 2014 to 2024.
- Chia et al. (2026) compare homes in near rings around hyperscale and other large data center openings to homes farther away or near sites where a data center opens later across U.S. housing markets from 2000 to 2025.

In contrast to the previous section, this chapter reports percentage effects for housing outcomes because the underlying comparisons—between homes at different distances from data centers—are more intuitive to interpret.

a. Homeowners

Data centers have depressed prices for homes very close to large facilities, with effects that persist for years and become stronger when jurisdictions host more large data centers.⁹ Impacts on housing prices decline as you move further away from data centers and when data centers are in commercial or industrial zones.

- **Near-facility price discounts:** Owner-occupied homes very close to large data centers have sold for meaningfully lower prices relative to otherwise similar homes slightly farther away. In Loudoun County, houses within 0.5 miles of an announced data center have sold for about 2.8 percent less than houses 0.5–2 miles away.¹⁰ Across the country, homes within 5 km of a hyperscale data center opening have sold for roughly 6.8 percent less than homes 20–50 km away in the same county, with housing price declines around 15 percent within 1 km and 9 percent within 1–4 km.

⁹ The parcel-level studies reviewed below agree that data centers depress prices for homes very close to large facilities. However, county-level evidence shows the opposite pattern at broader scales: U.S. counties more exposed to cumulative data center revenue growth have experienced higher house price indices (Alvarez et al 2026). OLO emphasizes parcel-level results because the impact of data centers on property values has occurred within very short distances of large facilities. As a result, counties are arguably an overly broad unit of analysis for assessing data center housing market effects.

¹⁰ A [study](#) by George Mason University’s Center for Regional Analysis for Northern Virginia found no statistically significant evidence that proximity to data centers reduces nearby home prices, using a cross-sectional hedonic pricing model of 2023 sales with distance to data centers as one of several explanatory factors. However, OLO emphasizes Rubinovitz (2026), which uses a quasi-experimental difference-in-differences design around data center permit announcements in Loudoun County, and arguably provides stronger identification of the causal effects of nearby data centers on housing prices.

- **Persistent price effects:** The negative impact of data centers on nearby home prices has lasted for years. In Loudoun County, houses within 0.5 miles of an announced data center continued to sell for less than houses 0.5–2 miles away for up to seven years after the permit was granted. Nationwide, near hyperscale openings, prices within 5 km began to decline about two years after commissioning and the decline in prices persisted in subsequent years, settling into a sustained loss of roughly 5 percent relative to the comparison properties.
- **Sensitivity to proximity and residential areas:** Data centers' impacts on home prices have been highly local. In Loudoun County, clear price declines were limited to houses within 0.5 miles of data centers, while houses 0.5–1.75 miles away experienced zero or slightly positive changes in prices. Nationwide, near hyperscale openings, price losses were largest within 1 km and 1–4 km and became small or essentially zero beyond roughly 14 km. Researchers saw sizable declines only when large non-hyperscale facilities were in highly residential areas.
- **Stronger discounts with more facilities:** In Loudoun County, larger housing price losses occurred for homes within 0.5 miles of two or more data centers and for newer, recently constructed houses. Nationwide, near hyperscale openings, larger housing price losses occurred around more power-intensive facilities and where development was novel—such as a county's first hyperscale opening. Evidence also suggests where nearby residents pay more attention to data centers, home-price impacts are more severe.
- **Land use and siting context:** Negative housing impacts have been much smaller when large facilities are embedded in more commercial or industrial zones rather than residential neighborhoods.

The evidence suggests that data center development in one jurisdiction has not generated comparable negative spillovers for nearby housing markets just across zoning or county boundaries.

- Nationwide, homes within 5 km of a hyperscale facility experienced pronounced price declines relative to homes 20–50 km away when located in the same zoning and regulatory jurisdiction as the facility, whereas similarly proximate homes located just over jurisdictional boundaries showed little or no comparable price losses.

Households living very near data centers have not experienced employment gains that would offset some of the housing market costs created by data centers.

- Nationwide, residential communities within roughly 5 km of hyperscale facilities did not experience large or sustained employment increases in key related sectors compared with more outlying areas.

In Loudoun County, property assessments near data centers have not fully reflected the declines seen in property values, which has effectively increased property tax burdens for nearby homeowners.

- In Loudoun County, assessed values for houses within 0.5 miles of data centers dropped by only about 1–1.5 percent five to six years after announcements, even as nearby sale prices fell by roughly 2.8 percent relative to houses 0.5–2 miles away. This suggests that Loudoun’s assessment practices have not fully captured the negative impacts on the housing market from nearby data centers, leaving homeowners near these facilities paying taxes on property values that overstated what their properties could sell for.

b. Renter Impacts

Evidence on renter impacts is limited, and the only available study from Loudoun County, Virginia finds no clear effect of data centers on nearby rental prices.

- In Loudoun County, nearby rental prices within 0.5 miles did not decline following data center announcements relative to rentals 0.5–2 miles away. This suggests that short-term renters did not require lower housing costs to compensate for any impacts due to their close proximity to data centers.

c. Fiscal Impacts

This section describes data on the fiscal impacts of data centers. It synthesizes findings from the Tax Foundation’s work on data center tax obligations, Gargano and Giacoletti’s analysis of state tax incentives, Jaros’s study of county-level abatements and short-run public finance, and selected government documents and news reports on local tax collections and policy debates.

Data centers face multiple layers of taxation—federal, state, and local—but most of their overall tax burden comes from the state and locality where they are sited.

- Federal corporate income tax on the parent company (typically a C corporation), with liability determined mainly by overall profits and sales rather than facility location.
- State corporate income taxes, which are generally apportioned based on sales in each state, apply to the firm as a whole rather than the specific data center.
- Local property taxes on land and buildings, which are a core part of ongoing tax obligations and vary with assessed values and local property tax rates.
- Tangible personal property (TPP) taxes on machinery and equipment in many states, often a major component of the total burden and particularly important for capital-intensive data centers.

- State and local sales and use taxes on servers, other equipment, and electricity purchases, frequently reduced or eliminated through data center-specific exemptions contingent on meeting economic development targets (e.g., number of jobs).
- Local license fees, impact fees, and negotiated developer payments or infrastructure commitments, commonly tied to connections and upgrades for water, sewer, and electrical service.

Data centers are a meaningful source of tax revenues for some jurisdictions, including Loudoun County and other parts of Northern Virginia. However, they may also lead to higher government output to accommodate them (e.g., roads and intersections, electricity distribution upgrades, water and sewer extensions), with preliminary evidence that some jurisdictions finance these short-run accommodation costs through increased borrowing rather than higher tax collections.

- In Loudoun County, personal property taxes on data center computer equipment alone are budgeted at about \$795 million in FY 2025, up from roughly \$466 million five years earlier, according to the county's own General Fund revenue tables.¹¹
- Loudoun County government states that rapid growth in data center tax revenues has enabled the Board of Supervisors to lower the real property tax rate for homeowners every year for the past decade and to set the current rate at the lowest level of any county in Northern Virginia.¹²
- Neighboring Prince William County reports that data centers contributed about \$294 million in total county tax revenue in tax year 2024—more than fortyfold higher than the roughly \$6.5 million generated in tax year 2012.¹³
- In the first couple of years after a county grants a tax abatement for a data center, local governments have tended to increase spending and output to accommodate the project. Evidence from Jaros (2025) indicates these short-run accommodation costs have often been financed through higher county borrowing rather than immediate growth in tax collections.

Tax abatements and exemptions targeting data centers are a common feature of state and local data center tax policy and appear effective in attracting data centers.

- Most states exempt data centers from sales and use taxes on tangible equipment such as servers, storage devices, network gear, and key infrastructure components like electrical systems, UPS, and cooling systems.
- A smaller group of states also provides exemptions or abatements for property taxes, with some exempting electricity consumed in data center operations.

¹¹ Loudoun County, Virginia, "[General Fund Revenue and Trends](#)," FY 2025 Proposed Budget. See also Nick Minock, "[Data centers helped drive down Loudoun County taxes, but new restrictions are on the way](#)," WJLA 7News, April 2, 2025.

¹² Loudoun County, Virginia. "[Data Centers – Tax Revenues and the County Budget](#)." Frequently Asked Questions, accessed July 19, 2026.

¹³ Prince William County, Virginia. [2024 Data Center Industry Tax Revenue Report](#). Accessed July 19, 2026.

- Nearly all programs condition eligibility on a minimum capital investment, and many also require a minimum number of full-time jobs, though these job thresholds are small relative to the scale of the required investment.
- Evidence from Gargano and Giacoletti (2026) suggests that these incentives have been effective at attracting large facilities, increasing the likelihood and scale of new hyperscale data center construction in adopting states.

Some states have recently curtailed or proposed phasing out tax incentives for data centers, and a few states have proposed new taxes targeting data centers.

- Minnesota has rolled back part of its data center incentive by removing the sales tax exemption for electricity, while keeping exemptions for computer purchases.¹⁴
- Illinois' governor has directed the state to pause new data center tax incentive agreements while lawmakers consider reforms.¹⁵
- Arizona has enacted a three-year moratorium on new sales and use tax exemptions for data centers as part of its state budget.¹⁶
- Lawmakers in many states—including New York, Connecticut, Georgia, Michigan, Pennsylvania, Virginia, and Washington—have introduced bills to phase out, sunset, or otherwise scale back existing data center tax breaks.¹⁷
- Indiana's HB 1333 would require data centers that receive state sales tax breaks to pay their host local governments at least 1 percent of the forgone sales tax as a new local contribution.¹⁸
- Virginia's 2026–2028 budget imposes a new, two year “Data Center Electricity Consumption Tax” of \$0.011 per kilowatt/hour on all electricity used by qualifying data centers.¹⁹

¹⁴ “[Policy Snapshot: Data Center Incentives](#),” National Conference of State Legislators, updated April 17, 2026,.

¹⁵ M. Dougherty, “[Gov. JB Pritzker suspends tax breaks for data centers, urges more discussion](#),” Capital News Illinois, June 5, 2026.

¹⁶ Amanda Greenwood, “[Which States Are Pausing Data Center Tax Incentives—And Why](#),” Newsweek, July 8, 2026.

¹⁷ Ibid.

¹⁸ Indiana General Assembly. [House Bill 1333, 2026 Regular Session](#); and MultiState. “[State Data Center Legislation in 2026 Tackles Energy and Tax Issues](#).” February 20, 2026.

¹⁹ “[Virginia Adds Electricity Consumption Tax but Stops Short of Repealing Data Center Sales Tax Exemption](#),” *National Law Review*, July 17, 2026; and “[Virginia Has a New Two-Year Budget. Here’s What Lawmakers Now Require of Data Centers](#),” *Virginia Mercury*, June 30, 2026.

Some economists conclude it is uncertain whether local economic benefits justify forgone tax revenue from data center tax breaks.

- Recent empirical work finds that, while data centers can generate local jobs, wage gains, and tax revenues, it is unclear whether these benefits are large enough to justify the substantial tax incentives many jurisdictions provide.

Chapter 3. Data Centers: Impacts on Energy Prices

As noted in Chapter 1, PJM, the organization that oversees Montgomery County’s electrical grid is at a turning point. The increased demand for electricity from the grid, driven by building data centers, far exceeds the energy available through the grid. This chapter describes the predicament facing PJM and its implications for Montgomery County and the broader state.

A. Methodology

This chapter synthesizes recent technical and regulatory documents to describe how rapid data center expansion is contributing to structural scarcity in PJM’s electric grid and driving electricity costs higher for Maryland customers.

The analysis draws primarily on the following reports:

- PJM’s 2026 [“Powering Reliability Through Market Design”](#) special report, which diagnoses the structural shift from surplus to scarcity in PJM, explains how rapid energy load growth (especially data centers) and slower generation build-out are undermining the existing capacity market design, and outlines alternative paths for reforming market rules to maintain reliability and affordability.
- PJM’s [2026 Load Forecast Tables](#), which provide projections of net energy for load and seasonal peak demand over 2026–2046 across the PJM-grid and utility zones.
- PJM’s [Independent Market Monitor’s 2026 Quarterly State of the Market report](#), which characterizes system-wide demand growth, capacity constraints, and wholesale price dynamics, and quantifies the effects of existing and forecast data center load on capacity revenues, wholesale prices, and customer bills.
- The Maryland Office of People’s Counsel’s [complaints, filings, and consumer guidance](#), which discuss how data centers are increasing transmission, energy, and capacity charges on Maryland customer bills.

B. Regional Transmission Organizations

“Load” means the amount of electricity being used at a given moment and is a synonym for electricity “demand.” When the load is growing, it means that people and businesses are using more electricity, requiring the grid to supply more electricity to meet the demand.

About 60 percent of the United States’ electricity load is organized through entities called Regional Transmission Organizations (RTOs).¹ Regulated by the U.S. Federal Energy Regulatory Commission

¹ [“Power Market Structure,”](#) U.S. Environmental Protection Agency (EPA), January 24, 2022.

(FERC), RTOs “are independent, membership-based, non-profit organizations that ensure reliability and optimize supply and demand bids for wholesale electric power,” according to the U.S. Energy Information Administration.² RTOs have two core functions: managing regional high-voltage transmission grids and operating wholesale electricity markets in areas under their control.

RTOs manage transmission grids, administering the bulk transmission system on a regional basis, constantly monitoring and directing the flow of electricity across high-voltage transmission lines to ensure the grid stays within its limits and remains reliable, and planning future transmission expansions.³

Operating wholesale electricity markets involves overseeing three primary markets that rely on competitive market mechanisms.⁴ The central participants on the supply and demand side of these markets are:

- **Resource owners and operators** are entities that own and run power plants and other grid resources. They generally come in three forms: **investor-owned utilities** (IOUs), which are for-profit, shareholder-owned companies regulated as monopolies in their service territories; **publicly-owned utilities**, which are non-profit entities owned by taxpayers and organized as municipal utilities or public utility districts; and **electric cooperatives**, which are private, non-profit utilities owned by the people they serve. These entities sell electricity and capacity to produce electricity into wholesale markets.
- **Load-serving entities** are utilities and competitive retail suppliers that are obligated to provide electricity to homes and businesses and therefore buy electricity and capacity from wholesale markets to serve their customers. Like resource owners, they can be investor-owned utilities, publicly owned utilities, or electric cooperatives. In competitive (restructured) states—where different companies can compete to sell power to customers instead of a single utility controlling both generation and retail supply—load-serving entities also include licensed non-utility retail suppliers that sell plans directly to customers.⁵

These actors participate in three markets—energy, capacity, and ancillary services—in many RTO regions where the RTO serves “as a broker between generation companies that bid to sell power into the wholesale markets, and distribution companies that submit bids to buy power from the markets”:⁶

² “[About 60% of the U.S. Electric Power Supply Is Managed by RTOs](#),” U.S. Energy Information Administration (EIA), April 4, 2011.

³ “[Power Market Structure](#),” U.S. EPA, January 23, 2022; [Reliability in PJM: Today & Tomorrow](#), PJM Interconnection, March 11, 2021; [Powering Reliability Through Market Design](#), PJM Interconnection, May 6, 2026.

⁴ [Energy Primer: A Handbook of Energy Market Basics](#), Federal Energy Regulatory Commission (FERC), 2024.

⁵ Federal Energy Regulatory Commission. *Energy Primer*; Consumer Advocates of the PJM States [Background on the Electric Network, PJM, and PJM Members, Volume II](#), 2024; John Blake, [Where Your Power Comes from: Electric Utilities 101](#), Ford School of Science, Technology, and Public Policy, University of Michigan, March 2026); [Understanding Wholesale Capacity Markets](#), FERC, June 2, 2026; [Third Party Suppliers](#), Maryland Office of People’s Counsel (OPC).

⁶ R. Campbell, [FERC Directs PJM to Expand Minimum Offer Price Rule](#), Congressional Research Service (CRS), 2020.

1. The **electricity energy market** is the “system for purchasing and selling electricity using supply and demand to set the price.” It consists of the day-ahead market, which “produces financially binding schedules for the production and consumption of electricity one day before the operating day,” and the real-time market, which “balances differences between the Day-Ahead scheduled amounts of electricity needed and the actual Real-Time load requirements.”
2. The **capacity market** is designed to make the electrical grid more reliable by paying power suppliers for their commitment to invest in generating capacity to meet future electricity needs. In other words, “A capacity market does not pay for the energy produced but instead pays for the ability to produce power when needed.”
3. The **ancillary services market** covers services required to ensure the reliability of and support for the transmission of electricity in RTO regions.

In many RTO regions, these markets are operated as competitive auctions. Generators and other resource owners submit offers to provide energy, capacity, or ancillary services, and the RTO selects the lowest-cost combination needed to meet demand and reliability requirements. Load-serving entities then purchase energy, capacity, and ancillary services in the auctions to fulfill their obligation to deliver electricity to homes and businesses and pass wholesale costs through to customers in retail rates.⁷

C. PJM Interconnection and the Crisis of Energy Scarcity

As noted in Chapter 1, the electric grid that runs through the DC metropolitan area is managed by PJM Interconnection, L.L.C. (PJM), an RTO that coordinates the movement of wholesale electricity through all or parts of the District of Columbia and 13 states.⁸ As shown within the PJM transmission zone map,⁹ PJM oversees both the Pepco and BGE zones that serve Montgomery County, Maryland, and the Dominion zone that serves Loudoun County and other Northern Virginia localities.

To say that the PJM electric grid is in crisis is not an overstatement. PJM describes its current situation as “a transition from an era of managing surplus to an era of managing scarcity – one that is projected to persist for a decade or more, because new generation simply cannot be built fast enough to offset the combined effect of retiring supply and surging demand.”¹⁰

The economics are straightforward: surging demand for electricity, coupled with constrained supply, result in higher prices. PJM has said that its current market structure cannot, on its own, generate enough new electricity to expand supply fast enough to close that gap, which is why electricity prices are rising and projected to remain elevated rather than inducing the usual corrective wave of increasing the supply.

⁷ *Energy Primer*, FERC; “Understanding Wholesale Capacity Markets,” FERC.

⁸ “PJM,” FERC; *Electric Power Markets*, FERC. “[Territory Served](#),” PJM Interconnection.

⁹ [PJM Zone Map](#), PJM Interconnection, May 11, 2023.

¹⁰ *Powering Reliability Through Market Design*, PJM.

D. Surging Demand

Surging demand for electricity is driven by the rapid expansion of data centers, in addition to broader electrification of the economy for electric vehicles, building electrification, etc. PJM understands its market is significantly different from the market in the 20th century: “[t]he coming wave of macro-load is fundamentally different from the residential and commercial load that defined the grid of the 20th century. Hyperscale data centers are unprecedented in their scale, with individual facilities approaching the size of traditional power plants.”¹¹

Historically, the PJM region experienced minimal total electricity growth. From 1998 to 2023, net energy for load in PJM increased from 718,248 GWh to 767,519 GWh—an increase of about 7% over 25 years—which implies an average annual compound growth rate of roughly 0.27%. Reflecting that flat history, PJM’s 2021 long-term forecast assumed that net energy load, summer peak, and winter peak would all grow at about 0.3% per year over the following decade.¹² Reflecting that flat history, PJM’s 2021 long-term forecast assumed that net energy load, summer peak, and winter peak would all grow at about 0.3% per year over the following decade.¹³

Definitions

- **Net energy for load growth** – the rate at which total annual electricity consumption in the PJM region is expected to increase over time; PJM reports it as an average annual percentage change in net energy for load (GWh)
- **Summer peak load growth** – the rate at which the highest hourly electricity demand in the summer season is expected to increase over time; it is measured as changes in summer peak load, expressed in megawatts (MW), summarized as an average annual percentage.
- **Winter peak load growth** – the rate at which the highest hourly electricity demand in the winter season is expected to increase over time; it is measured as changes in winter peak load, expressed in megawatts (MW), summarized as an average annual percentage.

Sources: PJM Interconnection, *2025 PJM Long-Term Load Forecast Report* (Valley Forge, PA, 2025); PJM Interconnection, *PJM Load Forecast Report, January 2017* (Valley Forge, PA, 2017)

However, PJM has revised its long-term load forecasts sharply upward in recent years due largely to the rapid growth of data center load.¹⁴ In its latest 2026 forecast, PJM now expects over the next 10-year period for:

¹¹ “[Load Forecast Development Process](#),” PJM Interconnection PJM RTO Historical Net Energy (GWh), 1998–2023.

¹² *Ibid.*

¹³ “[2021 PJM Load Forecast Report](#),” PJM Interconnection, January 6, 2021.

¹⁴ “[PJM’s Updated 20-Year Forecast Continues To See Significant Long-Term Load Growth](#),” PJM Interconnection, July 17, 2026.

- Net energy load growth to average 5.3% per year;
- Summer peak load growth to average 3.6% per year; and
- Winter peak load growth to average 4.0% per year.¹⁵

These all represent more than ten-fold increases in the projected growth rates compared to PJM’s 2021 predictions.

Data centers driving up demand for energy is evident when disaggregating energy use by locale, particularly in the DC metro region. Loudoun County, home to “Data Center Alley” in eastern Loudoun, is ground zero of the energy crisis facing the PJM grid. There has been a dramatic increase in energy use statewide due to the expansion of data centers in Northern Virginia, as well as electric vehicle adoption and building electrification. According to the U.S. Energy Information Administration (EIA), commercial electricity sales across Virginia increased by nearly 30.0 million MWh from 2019 to 2025, “much faster growth than in any other state except Texas, a much larger state.”¹⁶

PJM’s own forecasts show that most of the region’s future electricity demand growth is concentrated in Dominion’s territory, not in the utilities that serve Montgomery County and Maryland. In its latest 2026 forecast, PJM anticipates that Northern Virginia’s Dominion zone will experience much higher annual demand growth than Pepco and BGE in terms of net energy load as well as summer and winter peak loads.¹⁷ See Table 3-1.

Table 3-1. PJM 10-Year Net Energy Forecast by Utility (2026)

Utility	Net energy load annual growth rate	Summer peak load annual growth rate	Winter peak load annual growth rate
Dominion	7.2%	5.4%	5.1%
Pepco	3.3%	2.0%	2.1%
BGE	1.2%	0.4%	0.6%
PJM	5.3%	3.6%	4.0%

Sources: “[Reports & Notices](#),” PJM, Table E-1. Annual Net Energy (GWh) and Growth Rates for Each PJM Zone and Geographic Region (2026 - 2046); Table B-1. Summer Peak Load (MW) and Growth Rates for Each PJM Zone and Geographic Region (2026 - 2046); and Table B-2. Winter Peak Load (MW) and Growth Rates for Each PJM Zone and Geographic Region (2025/26 - 2045/46).

¹⁵ “[2026 PJM Long-Term Load Forecast Report](#),” PJM Interconnection January 13, 2026.

¹⁶ “[Commercial Electricity Sales Have Soared in Virginia, Driven by Data Centers](#),” U.S. EIA, May 5, 2026.

¹⁷ “2026 PJM Long-Term Load Forecast Report,” PJM Interconnection.

E. Constrained Supply

While data centers are driving up energy demand across the PJM grid, capacity supply is structurally constrained. In its first quarter 2026 State of the Market report, PJM’s Independent Market Monitor, marketing Analytics found, “The current supply of capacity in PJM is not adequate to meet the demand from large data center loads and will not be adequate in the foreseeable future. This is a simple factual issue. There is not enough capacity currently to meet the data center load.”¹⁸

In its special report on capacity market design and reliability, “Powering Reliability Through Market Design,” published in May 2026, PJM highlights three main factors constraining supply:

- **Retiring Dispatchable Plants:** Existing dispatchable power plants — ones that grid operators can turn on and off as needed — are retiring faster than new ones can replace them, especially older fossil-fuel plants.
- **Slower Construction of New Plants:** Building new generation is taking much longer than it used to due to equipment supply chain bottlenecks and permitting and interconnection delays.
- **Market Design Problems:** PJM’s existing market structure is not attracting enough new generation to expand grid capacity to meet rapidly rising demand. This reflects a combination of much higher capital costs for new plants, longer construction and interconnection timelines, and volatile federal and state energy policies that make future revenues harder to predict. In response, project finance lenders increasingly insist on long-term power purchase commitments or similar guarantees of stable revenue before they will finance new generation at reasonable borrowing costs. PJM stresses that “This is not a temporary market condition; it reflects a genuine structural shift in what the investment community requires to commit capital to large, long-lived generation assets in the PJM footprint.”

Loudoun County officials are seeing the same structural problems PJM describes. In a white paper published in 2024, Supervisor Mike Turner warns:

The existing paradigm of power generation, transmission and consumption this nation has relied on for more than a century is simply not capable of providing sufficient power to Loudoun County data centers (and very likely Prince William County data centers) going forward.... Essentially, we’ve invented the airplane but just realized we haven’t yet invented runways. This level of systemic change demands new paradigms at almost every level if we are to avoid an involuntary and likely painful landing.¹⁹

¹⁸ Monitoring Analytics, LLC, [2026 Quarterly State of the Market Report for PJM: January through March](#), May 14, 2026.

¹⁹ Loudoun County, Virginia, [Data Center Capital of the World: “A Strategy for a Changing Paradigm](#), by Vice Chair/Ashburn Supervisor Mike Turner, Loudoun County Board of Supervisors, July 1, 2026 (original ed. July 1, 2024).

F. Higher Energy Prices

The dramatic expansion of data centers and demand for electricity is driving up costs for Maryland residents, including in Montgomery County. Surging demand, coupled with constrained supply, has driven up prices. Given that the current market structure cannot induce enough new investment to expand supply fast enough to close that gap, prices are projected to remain elevated without outside intervention. “Large data center load additions have already had a significant and irreversible impact on PJM customers that will be paid through May 31, 2028, and will have additional significant impacts on other customers as a result of higher transmission costs, higher energy market prices and higher capacity market prices.”²⁰

The Maryland Office of People’s Counsel (OPC), the state’s independent ratepayer advocate, found that rapid data center growth in the PJM region has already substantially increased energy bills for Maryland households and businesses. OPC’s recent filings and consumer guidance focus on how data center-driven transmission upgrades, higher wholesale energy prices, and sharply rising capacity charges are being shifted onto Maryland customers under PJM’s current rules.²¹

The OPC argues that “[r]esidential customers should not be responsible for any of these costs caused by the massive electricity demands of data centers or by projections of significant data center growth.”²²

In May 2026, OPC filed a complaint with FERC arguing that PJM’s rules for allocating transmission costs have unlawfully assigned costs to Maryland customers.²³

- **Transmission costs:** OPC argues that PJM’s rules assigned Maryland customers responsibility for \$2 billion in capital expenditures out of the organization’s \$22 billion in transmission project costs advanced over the last three years. OPC claims that these costs will be recovered in rates for decades and “will drive up Maryland customer bills by \$1.6 billion in additional revenue requirements over the next ten years.”
- **Energy market costs:** OPC argues that data centers are driving higher wholesale energy costs for Maryland customers, even though these costs are harder to quantify because prices vary hour by hour. To support this claim, OPC cites a Bloomberg analysis showing that between 2020 and 2025 wholesale electricity prices rose much faster near data center “hot spots,” including around Baltimore, where prices more than doubled.²⁴ Since energy prices make up the largest share of wholesale costs that feed into the supply portion of a residential bill, OPC warns that

²⁰ PJM’s Independent Market Monitor.

²¹ “[Data Centers](#),” Maryland Office of People’s Counsel.

²² *Ibid.*

²³ [Complaint Requesting Fast Track Processing of the Maryland Office of People’s Counsel](#), Docket #EL26-63-000, FERC (May 7, 2026).

²⁴ J. Saul, et al., “[AI Data Centers Are Sending Your Power Bill Soaring](#),” *Bloomberg*, September 28, 2025, accessed July 20, 2026.

these data center-driven increases are directly raising monthly charges for Maryland households and businesses.

- **Capacity costs.** OPC identifies data centers as a primary driver of recent spikes in PJM capacity prices. The 2026 Q1 Independent Market Monitor report estimates that including existing and forecast data center load in the 2026/2027 and 2027/2028 capacity auctions increased PJM customers' bills by \$13,768,851,483, even with a price cap in place. Without the cap, the market-distorting effects of data center load on capacity revenues would have reached \$26,852,039,314.

Chapter 4. Environmental Impacts of Data Centers

Research and data show that both new construction and the operations of data centers have significant impacts on the environment, including on air, water, green spaces, and climate change. The two largest environmental impacts from data center operations are energy and water use. Impacts stemming from energy and water usage include greenhouse gas (GHG) emissions, emissions of fine particulate matter, PFAS (per- and polyfluoroalkyl substances) pollution (commonly referred to as “forever chemicals”), strain on the energy grid, and impacts on supply of water to surrounding communities.

Factors that influence the overall environmental impact of data centers include their size, the type of cooling system they employ, the climate of the area they are in (temperate, arid, etc.), and the type of energy they consume (renewable vs. nonrenewable resources).¹

The three most common types of data centers are:

- Enterprise data centers, which generally are owned by a business to service that organization and are typically smaller compared to other data centers;
- Colocation data centers, which lease out space, power, cooling, and connectivity to multiple businesses and vary in size; and
- Hyperscale data centers, which are the largest data centers (at least 10,000 square feet to over 1 million) and are becoming more common with the growth of generative AI.²

Hyperscale data centers generally have the largest environmental impacts due to their physical size, large operational capacity, and electricity and water needs. Currently, the U.S. accounts for about 54 percent of all hyperscale data center capacity worldwide.³ However, all data centers have some environmental impacts associated with their operations and their impacts on local air, energy, and water resources.⁴

Further, new construction of data centers, especially larger and hyperscale data centers meant to provide services for generative AI and other AI tools, are projected to grow in the next decade.⁵ While data centers have provided services such as cloud storage and hosting platforms for organizations,

¹ Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024.

² Library of Congress, [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), May 12, 2026. Currently, the largest single data center building in the U.S. is Switch TAHOE RENO 1 in Nevada, which spans 1.3 million sq. ft. G. Girollan, [What Are the Biggest Data Centers in the U.S.? Depends How You Measure](#), HowStuffWorks (Apr. 7, 2026).

³ Synergy Research Group, [Hyperscale Data Center Count Hits 1,136; Average Size Increases; US Accounts for 54% of Total Capacity](#), March 19, 2025.

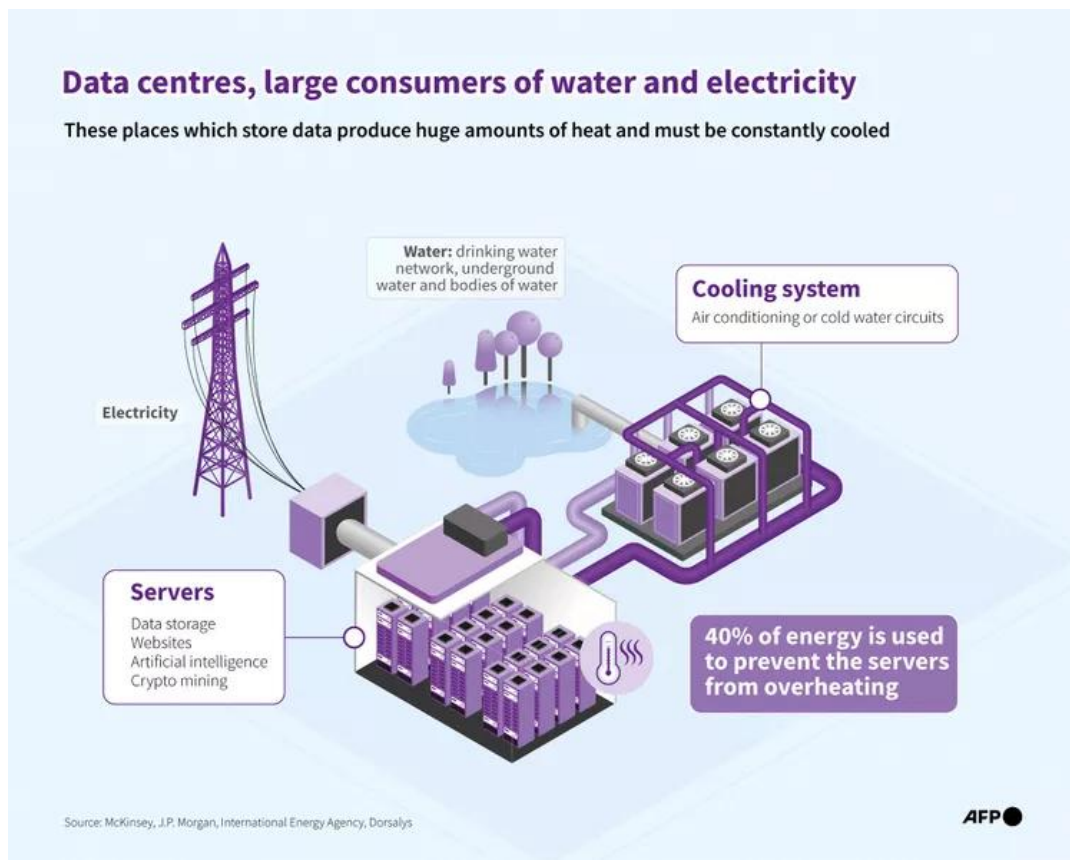
⁴ Library of Congress, [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), May 12, 2026.

⁵ Brookings, [The future of data centers](#), November 5, 2025; Turner, M (Ashburn, VA Supervisor) [Loudoun County, VA: Data Center Capital of the World "A Strategy for a Changing Paradigm"](#), July 1, 2026.

generative AI is much more energy and water intensive, due to the high computing power needed.⁶ As noted in chapter 1:

- Researchers at MIT's Lincoln Laboratory Supercomputing System estimate that generative AI and other AI tools will account for 21 percent of all electricity usage across the world by 2030.⁷
- The U.S. Department of Energy (DOE) projects data centers will account for 9 percent of the U.S.' total electricity demand by 2030.⁸
- Data centers accounted for about 4.7 percent of total U.S. electricity demand in 2024.⁹

The following graphic briefly explains water and electricity use associated with data centers.



Source: [The Hidden Cost of AI: How Data Centers Are Draining Water Resources and What It Means for Investors](#)

⁶Brookings, [The future of data centers](#), November 5, 2025; Turner, M (Ashburn, VA Supervisor) [Loudoun County, VA: Data Center Capital of the World "A Strategy for a Changing Paradigm"](#), July 1, 2026.

⁷ MIT Sloan, [AI has high data center energy costs — but there are solutions](#), January 7, 2025.

⁸ Presentation from Environmental Law Institute, [Local Environmental Impacts of Data Center Proliferation](#), December 10, 2024.; U.S. Department of Energy, [Clean Energy Resources to Meet Data Center Electricity Demand](#), Accessed 6/15/2026.; Berkeley Lab, [Berkeley Lab Report Evaluates Increase in Electricity Demand from Data Centers](#), January 15, 2025.

⁹ Lawrence Berkely Lab, [United States Data Center Energy Usage Report: 2025 Update](#), June 18, 2026.

This chapter explores the following impacts by presenting data at the national, state, and local level:

- A. Impacts of Energy Use on Air Pollution
- B. Impacts on Water
- C. Impacts on Agriculture and Green Space
- D. Impacts on Climate Change
- E. Mitigation Actions

Summary of Overall Impacts

Air Pollution. Consumption of electricity is one of the largest drivers of air pollution associated with data centers. Most data centers consume electricity powered by nonrenewable, fossil-fuel powered electricity, rather than renewable energy. Further, larger data centers are increasingly using diesel powered generators for backup power, which releases particulate matter 2.5 and nitrogen oxides and affect local air quality.

Climate Change. As temperatures rise due to climate change, the demand on the electrical grid will increase for cooling, especially during warmer months and heatwaves. Data centers require intensive cooling and the projected growth of data centers and more intensive operations for generative AI tools is likely to further strain the electrical grid. Droughts, also exacerbated by increased temperatures, may be further exacerbated by increased consumption of water by data centers for cooling.

Water Consumption. Water to cool data centers can come from local water utilities, on-site reservoirs, or nearby water sources. Water sourced from municipal groundwater wells for cooling can decrease groundwater levels, especially in areas prone to drought or densely populated areas. Depleting groundwater levels and aquifers not only reduces the amount of drinking water available but can reduce stream flows of bodies of water connected to groundwater. Further, chemicals can be introduced into the water supply from data center operations.

Agriculture and Green Space. Large scale land conversion for development of data centers alters both local ecosystems and built environments. Some impacts include:

- (1) Indirect health and climate impacts due to loss of green space, such as increased heat exposure;
- (2) Decreased capacity of natural green spaces to filter water and air; and
- (3) Replacing vegetation with impervious surfaces, which can impact water quality and increase flood risks.

A. Impacts of Energy Use on Air Pollution

Electricity consumption is one of the largest drivers of data centers' impact on the environment. As noted in chapter 1, servers and cooling equipment in data centers, especially larger ones, are typically on 24/7 to provide cloud services, website hosting, data storage, and AI processing tools around the clock.¹⁰ Byproducts of electricity generation can include carbon dioxide (a greenhouse gas), sulfur dioxide, nitric oxide and nitrogen dioxide, fine particulate matter, and release of heavy metals, which can all have negative effects on the environment and human health.¹¹

There is some variability in data on electrical consumption of data centers, due in part to size of data centers, types of cooling used, modeling and forecasting differences, including factors such as future efficiencies in data center operations, and rapid innovations in AI processing, which is driving increases in electrical consumption.¹² The following examples of electrical consumption use are from various government entities and peer-reviewed research:

- The International Energy Agency (IEA) found that a typical hyperscale, AI-focused data center consumes as much electricity as 100,000 households annually. Larger data centers currently under construction are projected to consume 20 times as much (2,000,000 households).^{13,14}
- The Congressional Research Service highlights data center industry analysts define hyperscale data centers as those that use at least 100 megawatts of power continuously. Operating year round and consuming 100 MW of energy continuously is enough to power 80,000 typical U.S. households annually.¹⁵
- The IEA estimated that in 2024, U.S. data centers consumed 183 terawatt hours (TWh) of electricity, over 4% of the U.S.'s total electricity consumption. The IEA projects consumption of U.S. data centers will grow by 133% to 426 TWh by 2030.¹⁶
- The Lawrence Berkeley National Laboratory estimates data centers' consumption could account for 9.5% - 15% of the U.S.'s total electrical use by 2030.¹⁷

¹⁰ Yes Energy, [What to Know About Data Center Growth, Energy Usage, and Efficiency](#), February 20, 2024.

¹¹ U.S. Energy Information Administration, [Electricity Explained](#), April 16, 2024.

¹² World Resources Institute, [Powering the US Data Center Boom: Why Forecasting Can Be So Tricky](#), September 17, 2025.

¹³ International Energy Agency, [Energy and AI](#), 2024.

¹⁴ According to the report from the IEA, the largest data center under construction currently will use around 2000 MW of energy continuously. The largest planned data center is estimated to use 5000 MW continuously. From: [Energy and AI](#)

¹⁵ Library of Congress, [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), May 12, 2026.; Viavi Solution, [What is a Hyperscale Data Center?](#), Accessed 6/15/2026.; IBM, [Hyperscale vs. colocation: Go big or go rent?](#), Accessed 6/15/2026.

¹⁶ Pew Research Center, [What we know about energy use at U.S. data centers amid the AI boom](#), October 24, 2025.

¹⁷ Lawrence Berkely Lab, [United States Data Center Energy Usage Report: 2025 Update](#), June 18, 2026.

- PJM estimates that data centers' consumption of electricity supplied by the PJM regional electricity grid will triple between 2024 and 2029.¹⁸

A 2025 study published in *Cleaner Energy Systems*, a peer-reviewed scientific journal, found 99 percent of total environmental impacts of a hyperscale data center in Virginia were from electricity consumption.¹⁹

The electricity used can either be from renewable (e.g., solar, wind, hydropower) or nonrenewable (e.g., coal, oil, natural gas (fossil fuels)) sources and the mix of energy used by data centers depends on the grid it consumes energy from, the presence of renewable energy onsite of a data center, and the use of backup generators for data centers, which are often diesel-powered. The type of energy used (renewable vs. nonrenewable) impacts the amount of GHG emissions and air pollution associated with the operations of data centers. A study that looked at 2,132 data centers²⁰ operating in the U.S. between September 2023 and August 2024 found fossil fuel powered plants supplied more than 56 percent of electricity consumed by these data centers.²¹

In Maryland in 2024, electricity generated in the state for consumption included the following fuel sources:

- Nuclear power – 49.1%
- Natural Gas – 34.2%
- Coal – 9.4%
- Renewable Energy (includes wind, solar, and hydropower) – 5.8%
- Petroleum – 1.5%²²

This accounts for approximately 57 percent of the power that Maryland consumes annually.

The rest of the electricity Maryland needs is delivered to the state via the PJM regional grid.²³ PJM's current generation fuel mix reported on their website is:²⁴

- Natural Gas – 42%
- Nuclear Power – 29.8%
- Coal – 13.6%
- Renewable Energy – 12.4%
- Petroleum - ~1%

¹⁸ CNS Maryland, [As data centers multiply, Maryland's power grid struggles to keep up](#), March 4, 2026.

¹⁹ Zhang, M., et. al., [Cleaner grid or smarter cooling? Environmental impact tradeoffs of data center using the life cycle assessment method](#), December 2025.

²⁰ This sample size accounts for 78% of all operational U.S. data centers.

²¹ Guidi, G. et. al., [Environmental Burden of United States Data Centers in the Artificial Intelligence Era](#), November 14, 2024.

²² U.S. Energy Information Administration, [Maryland End-use Energy Consumption 2024](#), 2024.

²³ U.S. Energy Information Administration, [Maryland Analysis](#), March 19, 2026.

²⁴ A category called multiple fuels was left out of the list, in order to match up with Maryland's data on fuel mixes. It accounted for about 1.8%.

Overall, nonrenewable energy sources account for a much larger share of the fuel mix generated for Maryland consumption compared to renewable energy. Nuclear energy also makes up a large share of the fuel mix. While nuclear reactors do not produce GHG emissions, there are emissions associated with fossil fuels burned to mine and refine uranium ore, carbon associated with the construction²⁵ of nuclear power plants, and the transportation of radioactive waste for storage and eventual disposal.²⁶

Greenhouse Gas Emissions. Greenhouse gases, which absorb and trap heat emitted from earth, include carbon dioxide, methane, nitrous oxide, and fluorinated gases. Combustion of fossil fuels, industrial activities, and livestock and agricultural practices all produce GHG emissions.²⁷

Data centers are an emerging contributor of GHG emissions. In the United States, data center operations were associated with 105 million tons of carbon dioxide emissions between September 2023 – August 2024, or 2.2 percent of the nation’s overall emissions. Currently, about 56 percent of electricity used to power data centers comes from fossil-fuel generated energy.²⁸ Data centers’ share of carbon dioxide emissions is projected to grow with the rapid growth in data centers and consequent growth in electricity demand.²⁹

Further, the rapid growth of generative AI is increasing GHG emissions associated with data centers. Cornell researchers found that by 2030, if the current rate of AI growth holds steady, there would be an additional 24 - 44 million metric tons of carbon dioxide associated with AI servers alone (not including data centers themselves). This is equivalent to adding 5 to 10 million cars to U.S. roads.³⁰

GHG emissions associated with data centers come from two main sources: operational and embodied carbon.

- **Operational carbon** is carbon associated with powering servers, cooling systems, backup generators, and other operations. Cooling systems that use air chilling consume more electricity than water cooling systems and, therefore, release more GHG emissions.³¹
- **Embodied carbon** refers to GHG emissions associated with the manufacturing, transportation, installation, maintenance, and disposal of building materials and products over the entire life cycle of a building, such as computer chips and other materials used in servers and systems within data centers.³²

²⁵ Carbon associated with construction is sometimes referred to as embodied carbon and includes greenhouse gas emissions associated with the extraction, manufacturing, transportation, installation, and disposal of materials. From: EPA, [Reduced Emissions in Construction Materials](#), Accessed 6/20/2026.

²⁶ U.S. Energy Information Administration, [Nuclear Explained](#), Accessed 6/20/2026.

²⁷ U.S. EPA, [Overview of Greenhouse Gases](#), Accessed 6/20/2026.

²⁸ Guidi, G. et. al., [Environmental Burden of United States Data Centers in the Artificial Intelligence Era](#), November 14, 2024.

²⁹ Guidi, G. et. al., [Environmental Burden of United States Data Centers in the Artificial Intelligence Era](#), November 14, 2024.

³⁰ Cornell Chronicle, [‘Roadmap’ shows the environmental impact of AI data center boom](#), November 10, 2025.

³¹ International Energy Agency, [Energy and AI](#), 2024.

³² GRESB, [Understanding embodied and operational carbon in data centers: ESG considerations](#), May 14, 2025.

Operational emissions have a much larger impact on communities near data centers as they directly affect local air pollution. These emissions include those generated from electrical consumption as well as the running of diesel backup generators during power outages and times of grid strain, which affect local air pollution and quality.

Particulate Matter 2.5. Data centers with on-site diesel generators can contribute to further air pollution. Large and hyperscale data centers in particular sometimes use on-site generators to meet the energy demand for operations. Diesel generators produce nitrogen dioxide,³³ smog, and fine particulate matter that are linked to respiratory and heart disease and decrease air quality locally.³⁴

Particulate matter (PM) is “the term for a mixture of solid particles and liquid droplets found in the air ... that are so small that they can be inhaled and cause serious health problems. Some particles less than 10 micrometers in diameter can get deep into your lungs and some may even get into your bloodstream. Of these, particles less than 2.5 micrometers in diameter, also known as fine particles or PM 2.5, pose the greatest risk to health.”³⁵

Beyond health impacts, fine particulate matter also impacts the environment and causes damage. Particulates can be carried over long distances by wind and settle on the ground and in water. Depending on the type and chemical make-up of particulate matter, environmental impacts include:

- Acidification of lakes and streams;
- Disrupting the nutrient balance in coastal waters and large river basins, which can lead to eutrophication and algae growths;
- Depleting nutrients in soil;
- Damaging sensitive forests and farm crops;
- Negatively affecting the biodiversity of ecosystems; and
- Contributing to acid rain and its impacts.³⁶

In Virginia alone, there are 10,500 generators attached to data centers, with some larger data centers equipped with dozens of generators.³⁷ Most of these generators are “Tier 2” diesel generators which emit more pollutants compared to newer, cleaner models that meet “Tier 4” status,³⁸ and are only permitted to run in emergencies or as a part of routine maintenance testing.³⁹ OLO notes these

³³ Nitrogen dioxide is a harmful gas pollutant which can cause breathing problems from both short- and long-term exposure, as well as contributing to acid rain and smog.

³⁴ Washington Post, [As data centers boom, Virginians breathe the exhaust of 10,000 diesel generators](#), May 28, 2026. See chapter 6 on racially disparate impacts of PM 2.5 pollution.

³⁵ U.S. EPA, [Particulate Matter Basics](#), Accessed 6/22/2026.

³⁶ U.S. EPA, [Health and Environmental Effects of Particulate Matter \(PM\)](#), Accessed 6/22/2026.

³⁷ Washington Post, [As data centers boom, Virginians breathe the exhaust of 10,000 diesel generators](#), May 28, 2026.

³⁸ Currently there are no limits on the runtime of nonemergency Tier 4 generators.

³⁹ Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024.

generators are used for backup generation, such as during power outages and when the grid is strained, and are not run under normal operations.

While a report from the Virginia Joint Legislative Audit and Review Commission examining data centers found backup generators are rarely run for prolonged periods, data center emissions from diesel generators have grown substantially in recent years (although they remain a relatively small contributor to overall regional air pollution). However, compared to 2015, PM 2.5 emissions from data centers were five times larger in 2023.⁴⁰ Continued data center growth in the area is likely to result in continued increases in PM 2.5 emissions. Data show communities living within a mile of a data center have higher air pollution burdens compared to the national median (above the 50th percentile of air pollution). This includes PM 2.5, nitrogen dioxide, and other pollutants.⁴¹ As the PJM grid undergoes maintenance and reliability is impacted by the projected growth in electricity consumption, it is likely PM 2.5 and other pollutants emitted from diesel generators will increase further.

Potential Local Impacts on Emissions Associated with Electricity. The operations of data centers in Montgomery County could increase local GHG emissions, especially if the electricity consumed by data centers comes from mostly fossil fuel generated energy.

The intensive energy use combined with increased local air pollution could have a negative impact on the County's contribution to climate change and could make it difficult for the County to meet its goals of cutting 100 percent of the County's GHG emissions by 2035. A 2020 GHG inventory conducted for the Climate Action Plan showed 49 percent of the County's emissions are associated with energy use in the residential and commercial sector.⁴²

Air pollutants like PM 2.5, which are released from the operations of diesel backup generators affect local air pollution and can travel across jurisdictions. An independent study analyzed emissions associated with a hyperscale data center in Loudoun County, Virginia. Emissions were calculated based off facility-wide emission limits specified in the operating permit of the facility. This figure shows the estimated increase in annual PM2.5 exposure across nearby census tracts and the average additional pollution residents in these tracts would be exposed to due to the Vantage Facility's emissions.⁴³ As shown by the figure, particulate matter from the Vantage Facility is estimated to travel across county

⁴⁰ Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024.

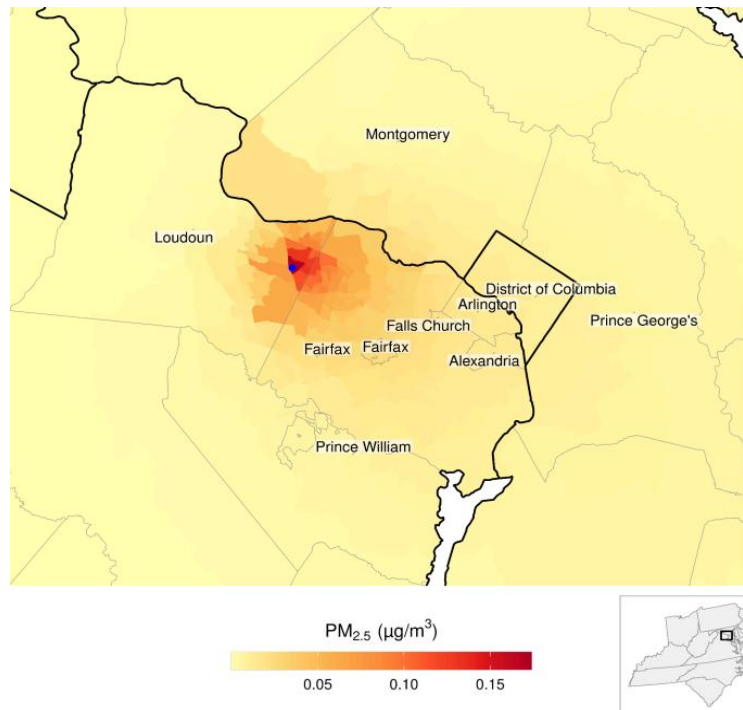
⁴¹ Environmental Data & Governance Initiative, [Communities Close to EPA-Regulated Data Centers Face Heightened Air Pollution](#), October 28, 2025. See chapter 6 for more information on how BIPOC communities are disproportionately represented in communities that are within a mile of a data center in the United States.; MIT Sloan, [AI has high data center energy costs - but there are solutions](#), January 7, 2025

⁴² Montgomery County Government, [Climate Action Plan Annual Report - FY25](#), 2025.

⁴³ Empower Analytics, [Air Quality, Health, and Economic Impacts of the Vantage Data Center Facility](#), February 27, 2026.

lines to the south-western portion of Montgomery County. In general, air pollutants like PM 2.5 can travel hundreds of miles due to atmospheric dispersion.⁴⁴

Figure 4-1. Estimated Regional Distribution of Annual-Average PM 2.5 Increases Attributable Only to the Vantage Data Center Facility



Source: [EmPower Analytics Group LLC](#)

Potential Local Impacts on Electrical Reliability. The PJM Interconnection grid serves 13 states and D.C., including Maryland and Virginia.⁴⁵ Energy demand from data centers, especially those powering emerging AI technologies, like generative AI, may cause the PJM grid to fall below reliability standards by June 2027, according to PJM officials.⁴⁶ If the region served by PJM does fall below reliability standards, it will increase the risk of rolling blackouts, especially during extreme hot and cold weather, which strains the electrical grid.

In May 2026, PJM was granted emergency approval from DOE to curtail power to data centers that have backup generation if electrical reliability is threatened due to hot weather. This would be done before

⁴⁴ Han, Y. et. al., [Health-Informed Computing: Estimating and Addressing the Public Health Impact of Data Centers](#), June 9, 2026.

⁴⁵ Federal Energy Regulatory Commission, [PJM](#), Accessed 6/3/2026.

⁴⁶ NRDC, [Building Data Centers Without Breaking PJM](#), September 30, 2025.; Yes Energy, [What to Know About Data Center Growth, Energy Usage, and Efficiency](#), February 20, 2024.; APS, [Data Centers](#), Accessed 6/3/2026.; EESI, [Communities Are Raising Noise Pollution Concerns About Data Centers](#), March 23, 2026.; PJM Inside Lines, [PJM Board Supports Action in Support of Urgent Grid Reliability Needs](#), February 5, 2025.

ordering rolling blackouts.⁴⁷ More recently during a July 2026 heatwave affecting the Eastern United States, the U.S. energy secretary instructed grid operators, like PJM, to require data centers to use backup generators and other power suppliers to ease strain on the electrical grid.⁴⁸

The more energy reliability is affected, the more data centers will need to depend on backup generation. Further reliance on diesel-powered generators could exacerbate environmental impacts associated with the operations of data centers. Mitigation measures can include having data centers bring their own power. However, while data centers can build their own renewable energy powered microgrids, diesel generators are most common currently.⁴⁹

B. Impacts on Water

Data centers use significant amounts of water. The three categories of usage in a data center's water footprint are:

- On-site water usage, which is mostly used for the cooling of facilities;
- Water use by power plant facilities, which supply power to data centers; and
- Water consumption during the manufacturing process of processor chips used in data centers.⁵⁰

Servers in data centers produce heat, due to the amount of energy used, and require cooling. The two primary types of cooling systems in current data centers in the U.S. are air conditioning, which is energy intensive, or evaporative cooling, which is water intensive. In general, evaporative cooling is more cost-efficient for many data centers, especially those that host generative AI services.⁵¹

Direct and indirect water consumption associated with cooling data centers are illustrated below.

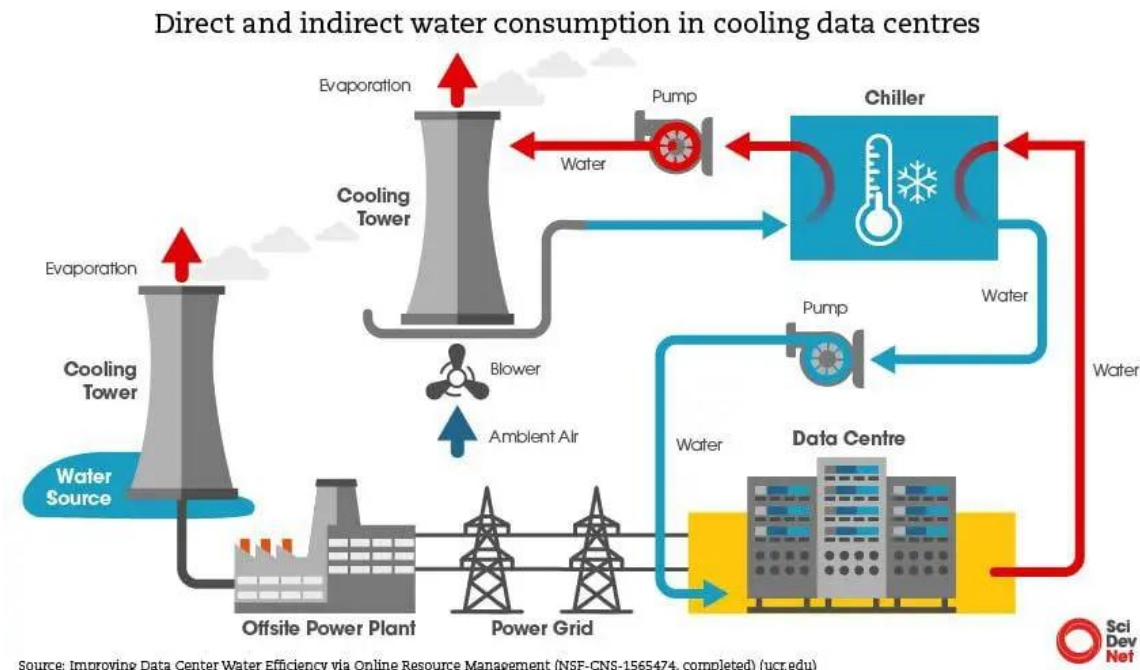
⁴⁷ Utility Drive, [PJM gets emergency approval to curtail data centers, large loads during hot weather](#), May 19, 2026.

⁴⁸ New York Times, [Energy Dept. Orders Data Centers to Tap Backup Power](#), July 2, 2026.

⁴⁹ IEEE Electrification Magazine, [Evolving a Data Center into a Microgrid](#), August 29, 2023.; Inside Climate News, [Data Centers' Use of Diesel Generators for Backup Power Is Commonplace—and Problematic](#), November 12, 2025.; NRDC, [Building Data Centers Without Breaking PJM](#), September 30, 2025.

⁵⁰ EESI, [Data Centers and Water Consumption](#), June 25, 2025.

⁵¹ Washington Post, [A new front in the water wars: Thirsty, giant data centers](#), April 25, 2023.



Source: [Data centres 'straining water resources' as AI swells](#)

Water to cool facilities come from local water utilities, on-site reservoirs, or nearby water sources. Water sourced from municipal groundwater wells or directly from aquifers for cooling can decrease groundwater levels, especially in areas prone to drought or densely populated areas. Depleting groundwater levels and aquifers not only reduces the amount of drinking water available but can reduce stream flows of rivers and other bodies of water connected to groundwater.⁵²

Data on water consumption by data centers can be proprietary but there are estimates from technology companies and researchers. There is variability in available statistics, which include:

- In 2023, Google reported using over 5 billion gallons of water across its U.S. data centers, with 31% of its freshwater coming from watersheds with medium or high water scarcity.⁵³
- In 2023, data centers in Northern Virginia consumed nearly 2 billion gallons of water, a 63% increase from 2019. Data centers in Loudoun County alone used about 900 million gallons of water.⁵⁴
- The Environmental and Energy Study Institute estimates large hyperscale data centers can consume up to 5 million gallons per day, equivalent to a town of 10,000 – 50,000 people.⁵⁵

⁵² University of Georgia, [Understanding How Data Centers Impact Surface and Ground Waters](#), June 10, 2026.

⁵³ Google, [Environmental Report](#), 2024.

⁵⁴ Financial Times, [US tech groups' water consumption soars in data centre alley](#), August 18, 2024.; Virginia Conservation Network, [Responsible Data Center Development](#), August 2024.; EESI, [Data Centers and Water Consumption](#), June 25, 2025.

⁵⁵ EESI, [Data Centers and Water Consumption](#), June 25, 2025.

- The International Energy Agency estimates a 100 MW data center may consume 530,000 gallons per day (averaged across various cooling strategies and including both direct cooling and indirect water usage from electricity generation).⁵⁶
- The Lawrence Berkeley National Laboratory estimates a mid-sized data center consumes around 300,000 gallons of water a day, about as much as 1,000 U.S. households.⁵⁷
- Federal and industry analyses compiled by the Energy Department and Lawrence Berkeley National Laboratory project that by 2028, hyperscale data centers will consume between 16 and 33 billion gallons of water annually. For comparison, all U.S. data centers consumed about 17 billion gallons of water in 2023.⁵⁸

The Water Cycle and Data Centers

Approximately 80 percent of water consumed on-site by data centers evaporates, with the remaining water discharged back into municipal wastewater facilities.⁵⁹ Water that is evaporated is not lost and is instead transformed from a liquid to gas (known as water vapor). Water vapor then rises into the atmosphere to fall back to the earth as a liquid through precipitation. However, as clouds and water vapor move through the atmosphere, water released via precipitation may not fall back from where it was consumed.⁶⁰ Therefore, excessive water consumption in a given water source may deplete the source faster than it can be recharged.

Water Cooling and its Impacts. Water cooling is an increasingly common type of cooling for data centers. Water cooling systems can either have an open or closed loop and can be an evaporative or a dry heat rejection system (heat from the data center is transferred to a fluid in coils, then air is blown over the coils to transfer the heat into atmosphere). Evaporative, open cooling systems are generally more common and more water consumptive while closed loops systems use more electricity and consume the least amount of water.⁶¹ The next table compares components of these systems.

⁵⁶ International Energy Agency, [Energy and AI](#), 2024.

⁵⁷ NPR, [Data centers, backbone of the digital economy, face water scarcity and climate risk](#), August 30, 2022.

⁵⁸ Forbes, [America's AI Boom Is Running Into An Unplanned Water Problem](#), January 11, 2026.

⁵⁹ Li, P., et. al., [Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models](#), March 26, 2025.; EESI, [Data Centers and Water Consumption](#), June 25, 2025.

⁶⁰ NOAA, [The water cycle](#), February 5, 2026.

⁶¹ Data Centers Today, [Cooling Without the Drain: How Closed-Loop Systems Cut Day-to-Day Water Use](#), April 22, 2026.

Table 4-1. Comparison of Open- and Closed-Loop Cooling Systems

Type of Cooling	Water Use	Energy Efficiency	Contamination and Reliability	Infrastructure Complexity
Open-Loop	High water consumption due to evaporation	Energy-efficient because evaporation removes heat with low electrical input	Water is exposed to air which requires filtration, chemical treatment, and monitoring for biological growth	Requires cooling towers, water treatment systems, and large-scale plumbing
Closed-Loop	Minimal water loss; water stays inside sealed circuits	Less-energy efficient because heat must pass through a heat-exchanger (more electricity required)	Sealed system – no airborne contamination, more stable water chemistry, and reduced maintenance	Requires pumps, heat exchangers, and sometimes a secondary tower or dry cooler

Source: [Louisiana Department of Conservation and Energy](#)

Closed-loop systems in theory can continuously use the water inside systems, although leaks and other issues may occur. In general, closed-loop cooling systems can reduce a data center’s freshwater use by 70 percent.⁶² Open-loop systems consume water, which can be sourced from municipal water, surface water, groundwater, and recycled water, and circulate it through the system to capture and carry away heat. The water is evaporated in a cooling tower to dissipate heat into the environment.⁶³ Non-evaporated water can be recycled typically 3-10 times (depending on water quality) before it is discharged.⁶⁴

When water from an open-loop system is discharged, high concentrations of salt and other contaminants (magnesium, sulfate, and potassium) released from the cooling process are flushed out of evaporative cooling towers using fresh water, known as “blowdown.”⁶⁵ Data centers using evaporative cooling can release contaminants back into the environment, which can contaminate groundwater supplies and pose serious health risks when concentrations increase (e.g., high sulfate levels in groundwater can lead to skin irritation and diarrhea).⁶⁶

PFAS. Data centers also have the potential to increase PFAS (per- and polyfluoroalkyl substances) pollution. Commonly referred to as “forever chemicals,” PFAS are widely used, long lasting chemicals that break down slowly over time. PFAS are commonly found in U.S. rivers and waterways and researchers estimate that 200 million people in the U.S. are served by water systems that contain PFAS and 20 percent of private wells are contaminated.⁶⁷

⁶² Brookings, [AI, data centers, and water](#), November 20, 2025.
⁶³ University of Michigan, [What Happens When Data Centers Come to Town?](#), July 2025.
⁶⁴ Li, P., et. al., [Making AI Less "Thirsty": Uncovering and Addressing the Secret Water Footprint of AI Models](#), March 26, 2025.
⁶⁵ Library of Congress, [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), May 12, 2026.
⁶⁶ Gour, N., Ortiz, L., and Maibach, E., [Health implications of the rapid rise of data centers in Virginia: an exploratory assessment](#), February 5, 2026.
⁶⁷ John Hopkins, [The Omnipresence of PFAS - and What We Can Do About Them](#), March 28, 2024.

Peer-reviewed research has shown exposure to PFAS may be linked to harmful health effects in humans and animals.⁶⁸ Leaks, spills, or improper wastewater disposal in facilities using PFAS can lead to them entering the surrounding soil and groundwater systems.⁶⁹

PFAS are used in data center cooling systems, both as non-water liquid coolants in water cooling systems and in air cooling.⁷⁰ Fluorinated gases, a type of PFAS, are sometimes used in air cooling systems in data centers. Further, PFAS may be introduced into the surrounding environment during the flushing of evaporative cooling towers in data centers.⁷¹ Direct PFAS pollution can occur from using PFAS to cool servers and suppress fire. However, it is difficult to ascertain the magnitude of the pollution, especially for closed-loop systems.⁷²

Indirectly, manufacturing companies that produce materials with PFAS for use in data centers are a larger source of pollution. Researchers have found airborne PFAS emissions from Chemours (one of the largest producers of PFAS globally) operations in North Carolina have contaminated more than 7,000 drinking water wells.⁷³

Laws such as the Clean Water Act, Safe Drinking Act, and Toxic Substances Act could offer opportunities to address PFAS contamination in various industries. However, the Trump Administration and the EPA are loosening regulations. For example, in September 2025, the EPA announced plans to fast track the review process for chemicals used in data centers, including expediting permitting processes for data center materials and infrastructure – including coolants, semiconductors, and fire suppressants where PFAS and other contaminants are present.⁷⁴

The federal Toxic Substance Control Act (TSCA) requires anyone who manufactured or imported PFAS or PFAS containing articles into the U.S. between January 1, 2011, and December 31, 2022, to submit a report to the EPA that includes data on types, volumes, uses, and environmental and health data. Reports were originally intended to be submitted in November 2024, but EPA has pushed the reporting requirement until January 2027. Data centers that have imported items containing PFAS should be subject to the reporting requirements.⁷⁵

⁶⁸ EPA, [PFAS Explained](#), Accessed 6/13/2026.

⁶⁹ University of Georgia College of Agricultural and Environmental Sciences, [Understanding How Data Centers Impact Surface and Ground Waters](#), Accessed 6/13/2026.

⁷⁰ The Guardian, [Advocates raise alarm over Pfas pollution from datacenters amid AI boom](#), October 4, 2025.

⁷¹ University of Georgia, [Understanding How Data Centers Impact Surface and Ground Waters](#), Accessed 6/13/2026.

⁷² Environmental and Energy Study Institute, [Data Centers Are Contributing to PFAS Forever Chemical Pollution](#), April 6, 2026.

⁷³ VanDerwerker, T. J., Knappe, D. R. U., and Genereaux, D. P., [Adapting to PFAS contamination of private drinking water wells near a PFAS production facility in the US Atlantic Coastal Plain of North Carolina](#), July 28, 2024.

⁷⁴ EESI, [Data Centers Are Contributing to PFAS Forever Chemical Pollution](#), April 6, 2026.

⁷⁵ See [TSCA Section 8\(a\)\(7\) Reporting and Recordkeeping Requirements for Perfluoroalkyl and Polyfluoroalkyl Substances](#), USEPA.

Potential Local Impacts. Montgomery County and the majority of the Washington metropolitan area's drinking water supply comes primarily from the Potomac River,⁷⁶ with the Patuxent River providing some drinking water to a small, southern portion of Montgomery County.⁷⁷ According to a report from the Interstate Commission on the Potomac River Basin, there is a small but increasing chance (1% in 2030 and 5% in 2050) that there will not be enough water to meet the demands of water consumption by residents while leaving enough water in the Potomac River to protect sensitive aquatic habitats.

Further, data gathered for the study indicate that extreme hydrological droughts may become more severe due to increasing temperatures, known as "hot droughts." Rising temperatures increase evaporation from soils and water surfaces, which can affect streamflow and water availability.⁷⁸

The report cited data center growth as a contributing factor to regional projections for uncertain water availability in the future, with projections in the Washington metropolitan area that data centers could use as much as 80 million gallons of water on peak operating days by 2050.⁷⁹

Generally, data centers use municipal water systems but they can use groundwater and aquifer supplies on occasion. The Department of Environmental Protection (DEP) estimates about 17,500 properties in the County use an onsite well for their water supply that connects directly to groundwater. Most of these are found in large-lot residential and rural-zoned areas, predominantly in the western and northern parts of the County. DEP also notes there are additional wells that still serve properties within existing public water service areas (sewer mains).⁸⁰

As previously mentioned in this section, water sourced from municipal groundwater wells or directly from aquifers for cooling can decrease groundwater levels, especially in areas prone to drought or densely populated areas. Depleting groundwater levels and aquifers not only reduces the amount of drinking water available but can reduce stream flows of rivers and other bodies of water connected to groundwater.

⁷⁶ OLO notes the City of Rockville, which operates its own water treatment plant, draws from the Potomac River as well.

⁷⁷ [Where Does My Water Come From? | WSSC Water](#). See appendix for map of water service areas, per WSSC. See also [Data Centers and Water Use in the Potomac River Basin](#), Interstate Commission on the Potomac River Basin, March 2026.

⁷⁸ Interstate Commission on the Potomac River Basin, [2025 Washington Metropolitan Area Water Supply Study](#), December 2025.

⁷⁹ Interstate Commission on the Potomac River Basin, [2025 Washington Metropolitan Area Water Supply Study](#), December 2025.

⁸⁰ Montgomery County DEP, [Water Supply Wells](#), Accessed 6/13/2026.

C. Impacts on Agriculture and Green Spaces

Building data centers can alter local ecosystems and built environments if the building involves large scale land conversion.⁸¹ Impacts can include:

- Indirect health and climate impacts due to loss of green space, such as increased heat exposure;
- Decreased capacity of natural green spaces' services of filtering water and air; and
- Replacing vegetation with impervious surfaces, which can impact water quality and increase flood risks.

Further, farmland conversion is generally permanent. Once farmland is converted to industrial use, it is rarely returned to production for crops. This is partly due to intensive soil remediation after industrial use, brownfield clean ups, and long rezoning processes. Site selection and land-use policy is critical for long-term agricultural viability.⁸² The Pew Research Center found in 2026, of the approximately 1,500 planned data centers, 67 percent are planned to be sited in rural areas. This is a shift from existing data centers, of which 87 percent are currently located in urban areas. In addition, 39 percent of planned data centers are in counties that do not currently have data centers.⁸³

Many developers view agricultural land as ideal for data centers because it often includes large, flat areas of land not located near dense populations that have access to electrical and water utilities.⁸⁴ Similar to agriculture, data centers are land, water, and energy intensive so data centers and agricultural use can compete for limited resources.⁸⁵ While the Farm Bureau reports that agriculture is increasingly depending on the digital infrastructure data centers provide, there is tension between how to equitably share these resources amongst the two industries.⁸⁶

Potential Local Impacts. Building data centers in the Agricultural Reserve could change the character of the reserve and possibly lead to competition of water and energy resources between the currently operating farms and any future data centers. As discussed further in Chapter 5, data centers can also increase noise and light pollution from their operations which would affect the character of the surrounding rural neighborhoods and wildlife.⁸⁷

⁸¹ Large scale land conversion is changing a large area of land from one primary use to another, such as from agricultural to industrial use.

⁸² American Farm Bureau, [Balancing Data Center Growth with American Agriculture](#), April 23, 2026; Brookings, [The local implications of data centers for rural communities in the US](#), January 27, 2026.

⁸³ Pew Research Center, [Most new data centers in the U.S. are coming to rural areas](#), April 13, 2026.

⁸⁴ American Farm Bureau, [Balancing Data Center Growth with American Agriculture](#), April 23, 2026;

⁸⁵ American Farm Bureau, [Balancing Data Center Growth with American Agriculture](#), April 23, 2026; Brookings, [The local implications of data centers for rural communities in the US](#), January 27, 2026.

⁸⁶ American Farm Bureau, [Balancing Data Center Growth with American Agriculture](#), April 23, 2026;

⁸⁷ Montgomery County Office of Agriculture, [The Ag Reserve](#), Accessed 6/13/2026.

The Agricultural Reserve in Montgomery County encompasses 93,000 acres (about one-third of the County) and is zoned as agriculture as its primary use. Per the Office of Agriculture, the Agricultural Reserve enhances the quality of life for all residents by:

- Promoting cleaner air;
- Improving regional water quality;
- Eliminating impervious surfaces, thus reducing water runoff;
- Providing wildlife habitats;
- Yielding local food production; and
- Providing scenic, rural vistas and recreational opportunities for residents.⁸⁸

According to the 2022 USDA Census of Agriculture, the County ranks ninth in the state for the sale of food produced and there are over 330 farms in food production (out of the over 500 total farms operating in the reserve).⁸⁹

D. Impacts on Climate Change

Many of the impacts of data center operations on air, water, and loss of agricultural land and green spaces contribute to climate change.

- Data centers are an emerging contributor of GHG emissions, responsible for 2.2 percent of overall U.S. emissions from 2023-2024. The projected rapid growth of data centers will further increase their share of emissions, which will likely exacerbate climate change.⁹⁰
- As global temperatures rise due to climate change, data centers' electricity demands for cooling (and for operation in general) compete for limited available supply of electricity.
- Data centers' large physical footprint creates impervious surfaces such as concrete and asphalt, which can lead to higher localized heat (known as urban heat island effect), higher flood risk due to surface runoff, and loss of greenspace.

Further, data centers would need to pursue water conservation and restoration mechanisms locally to offset the negative impacts of consuming potable water. This could include using recycled water, salt water run through desalination processes, or moving to air cooling (which is energy intensive and would require being powered by renewable energy to mitigate GHG emissions associated with electrical consumption).

Technological advances in the design and operation of data centers have the potential to mitigate some negative impacts. For example, advances in generative AI and other AI tools are providing new

⁸⁸ See chapter 5 for more detail

⁸⁹ Montgomery County Office of Agriculture, [Ag Facts](#), Accessed 6/13/2026.

⁹⁰ Gour, N., Ortiz, L., and Maibach, E., [Health implications of the rapid rise of data centers in Virginia: an exploratory assessment](#), February 5, 2026.

advances in climate change modeling, among others.⁹¹ Advances in clean energy generation can contribute to net-zero carbon data centers. However, both data center entities and electrical grid utilities would likely need to pursue clean energy generation. The next section describes different types of actions that can mitigate some environmental impacts of data centers.

E. Mitigation Actions

This section explores mitigation measures aimed at decreasing negative impacts on the areas discussed in this report – air, water, and agricultural lands – and identifies entities that can implement these measures.

Brookings recommends that communities know the cost of planned data centers, understand who pays the costs, examine local risks and benefits, and consider the long-term evolution of generative AI and how this may impact local costs and resources. To do so, Brookings recommends communities obtain quantifiable data on job opportunities (both short term and long term), tax revenue, workforce training programs, health and well-being contributions, and other benefits of proposed facilities.⁹²

1. Increase Available Renewable Energy

Type of Impact Addressed: Air Pollution

Implementation By: County, State, Data Center Entity, Regional Grid Operator

Increasing the share of renewable energy sources to power data centers would significantly decrease GHG emissions from data centers. Consumption of electricity is one of the largest drivers of data centers' impact on the environment and most data centers are powered by regional electricity grids that are still primarily powered by fossil fuels.⁹³

Potential mitigation actions include:

- Increasing the share of renewable energy used to power the local electrical grid; and
- Requiring data centers to use clean energy, such as being powered by microgrids using renewable energy.

Because data centers consume large amounts of electricity, introducing more renewable energy into electrical grids across the U.S. would have a large, positive impact on air pollution and would reduce

⁹¹ Camps-Valls, G., et. al., [Artificial intelligence for modeling and understanding extreme weather and climate events](#), February 24, 2025; Forbes, [How AI Is Transforming Climate Change Prediction And Mitigation](#), April 1, 2025.; NOAA, [AI methods enhance rainfall and ocean forecasting in climate model](#), March 7, 2025; Xiao, T., et. al., [Environmental impact and net-zero pathways for sustainable artificial intelligence servers in the USA](#), November 10, 2025.

⁹² Brookings, [Why community benefit agreements are necessary for data centers](#), January 29, 2026.

⁹³ Bharambe, M., et. al., [Analyzing Data Centers' Impacts on the Environment and Pathways to Sustainability](#), December 12, 2024; U.S. Congress, [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), May 12, 2026.

GHG emissions associated with data center operations, in addition to residential, commercial, and other industrial uses powered by the grid.⁹⁴

Actors that can impact the availability of renewable energy include regional power grid operators', which can add clean energy generators to their grids, state and local officials developing requirements for the operation of data centers (e.g., laws on energy use, clean energy agreements with data centers, requiring on-site battery storage).

Three hyperscale data centers in the U.S. currently run off 100 percent renewable energy, using a mix of onsite and offsite generated renewable energy.⁹⁵ Strategies, such as the Switch Citadel Campus in Nevada using solar partnerships to provide 100 percent green power through a combination of solar and wind farms, could be a model for future data center development.⁹⁶

2. Decreasing PM 2.5 Pollution

Type of Impact Addressed: Air Pollution

Implementation By: County, State

Data centers frequently employ backup diesel generators to provide emergency energy when the grid cannot serve their total needs. With energy demand increasing, grid operators may increasingly require data centers to run off their backup power supply during times of peak demand.⁹⁷ Backup diesel generators release PM 2.5 pollution, along with nitrogen dioxide,⁹⁸ smog and fine particulate matter, which are linked to respiratory and heart disease and decrease air quality locally.⁹⁹

Until data centers move away from diesel generators entirely, requiring use of cleaner backup diesel generators can reduce environmental impacts. Virginia recently updated their air permit process to require new data centers to use cleaner diesel generator technology (Tier 4). The cleaner generators meet the most stringent EPA requirements and emit less air pollution than older generation generators, although they still run on diesel.¹⁰⁰

⁹⁴ Zhang, M., et. al., [Cleaner grid or smarter cooling? Environmental impact trade-offs of a data center using the life cycle assessment method](#), December 2025. See appendix for a summary of Department of Energy recommended actions to decrease greenhouse gas emissions associated with data center operations.

⁹⁵ Data Centre Magazine, [Top 10: Data Centres Using 100% Renewable Energy](#), August 27, 2025; Public Citizen, [Reining in Big Tech: Policy Solutions to Address the Data Center Buildout](#), December 3, 2025.

⁹⁶ DGT Finance, [Inside the World's Largest Data Center](#), Accessed 6/17/2026.

⁹⁷ Inside Climate News, [Data Centers' Use of Diesel Generators for Backup Power Is Commonplace—and Problematic](#), November 12, 2025.

⁹⁸ Nitrogen dioxide is a harmful gas pollutant which can cause breathing problems from both short- and long-term exposure, as well as contributing to acid rain and smog.

⁹⁹ Washington Post, [As data centers boom, Virginians breathe the exhaust of 10,000 diesel generators](#), May 28, 2026.

¹⁰⁰ Virginia Department of Environmental Quality, [APG-576 - Diesel Engine Generator Set Procedure for Writing New and Modified Permits](#), December 29, 2025.

3. Green Power Purchase Agreements and Community-Based Agreements

Type of Impact Addressed: Air Pollution, Water, Agricultural Land

Implementation By: County, State, Data Center Entities, Regional Grid Operators

Green power purchase agreements (PPAs) and Community Benefits Agreements (CBAs) are two strategies that can be used to require data center entities to use renewable energy. Further, CBAs can set requirements beyond using clean energy, such as limits on water consumption, and other agreements that would benefit the community that includes a data center.

PPAs are long-term contracts with power generators where an organization agrees to buy energy from the generator.¹⁰¹ An example of a recent PPA is one between Microsoft and Brookfield Renewable, a third party, where Microsoft will buy more than 10.5 GW of clean energy projects from Brookfield to power U.S. and European facilities, including data centers, on clean, carbon-free power.¹⁰²

Community Benefit Agreements are legally binding contracts between a jurisdiction and an entity, such as a data center entity. CBAs allow governments to shape how an entity will operate in its jurisdiction. CBAs can be used to require data centers to be transparent with their electricity and water consumption, set limits on water consumption, use clean, renewable energy, and contribute funds that can be used for community sustainability and infrastructure upgrades.¹⁰³

In 2025, Lancaster, Pennsylvania entered into a CBA with a developer building two data centers in the city.¹⁰⁴ The CBA restricts water usage to 20,000 gallons a day, establishes reliance upon clean energy, and sets strict noise levels, among other things.¹⁰⁵ In Cedar Rapids, Iowa, Google and QTS are separately building data centers. Google has agreed to pay \$400,000 annually for 15 years into a community betterment fund and QTS has agreed to pay \$18 million over the next 18 years. Google is receiving a 20-year partial tax exemption from the city if it provides at least 31 full-time positions “at a high-quality wage of at least \$26.20 per hour after construction.”¹⁰⁶

CBAs can also include agreements on water usage. In Berkeley County, SC, Google signed an agreement to only be able to withdraw groundwater for operations as a last resort when all other water supplies

¹⁰¹ EPA, [Green Power Supply Options](#), Accessed 6/17/2026; International Energy Agency, [Energy and AI](#), 2025; Pillsbury Law, [Power Purchase and Interconnection Agreements for Data Centers](#), July 21, 2025.

¹⁰² Utility Dive, [Brookfield, Microsoft ink largest-ever corporate clean energy deal for 10.5 GW](#), May 2, 2024.

¹⁰³ Brookings, [Why community benefit agreements are necessary for data centers](#), January 29, 2026.; [Here’s what communities can do when data centers arrive | WWNO](#); [Expert Insights on Best Practices for Community Benefits Agreements](#)

¹⁰⁴ [CBA](#). See appendix for the CBA agreement summary between Lancaster and the data center entity.

¹⁰⁵ Brookings, [Why community benefit agreements are necessary for data centers](#), January 29, 2026.; City of Lancaster, PA, [Community Benefits Agreement Summary](#), November 2025; City of Lancaster, PA, [Data Center Community Benefits Agreement](#), Accessed 6/17/2026.

¹⁰⁶ Daily Iowan, [Cedar Rapids data centers ignite concern from energy advocates, excitement from officials](#), December 9, 2025.

are exhausted. The agreement also requires Google to develop alternative sources of water and publicly report its groundwater use quarterly (state law requires annual reporting).¹⁰⁷

4. Improve Data Center Efficiency

Type of Impact Addressed: Air Pollution, Water

Implementation By: County, Data Center Entities

Opportunities exist to improving the operational efficiency of data centers through more efficient hardware, AI algorithms, physical buildings and infrastructure, and cooling systems – to decrease the amount of water and electricity used in the operations of data centers.¹⁰⁸ Examples of efficiency measures being implemented in some data centers include:

- Arranging servers in a more energy efficient manner, such as being set up higher on a server rack and evenly distributing servers for optimal air flow.¹⁰⁹
- Using “carbon aware” software that automatically adjusts operations and workloads to avoid running at peak energy periods. MIT and Northeastern University built a software tool that can adjust computing power during peak energy periods and reduce the carbon intensity of operations by about 80 to 90 percent.¹¹⁰

Automating operations to avoid running at peak energy periods can also include aligning workloads for when renewable energy sources are online, rather than when nonrenewable sources are providing most of the power.¹¹¹

While data center entities are ultimately responsible for improving the efficiency of data centers through using more efficient hardware and algorithms, local governments, through development or contract negotiations, can require data centers to use the most efficient available technologies.

¹⁰⁷ Southern Environmental Law Center, [Google agrees to limit groundwater use from S.C. aquifer](#), December 16, 2019.

¹⁰⁸ U.S. Department of Energy, [Clean Energy Resources to Meet Data Center Electricity Demand](#), Accessed 6/17/2026.

¹⁰⁹ Federal Energy Management Program, [Best Practices Guide for Energy-Efficient Data Center Design](#), July 2024.; Cai, S. and G, Z., [Towards energy-efficient data centers: A comprehensive review of passive and active cooling strategies](#), February 2026.

¹¹⁰ MIT, [AI has high data center energy costs — but there are solutions](#), January 7, 2025.

¹¹¹ Senga, J. R. L., Wang, S., and Knittel, C. R., [Flexible data centers reduce power system costs but can increase emissions](#), July 17, 2026.

5. Use Less Water-Intensive Cooling Methods

Type of Impact Addressed: Water

Implementation By: County, State, Data Center Entities

Technological advances in cooling systems that can decrease water usage in data centers include:

- Using recycled or non-potable water in water cooling systems to avoid depleting municipal drinking water supplies;
- Closed-loop water systems, which consume far less water than open-loop systems;
- Air-chilled systems which come with the tradeoff of consuming more electricity but consume less water; and
- Immersion cooling, which submerges servers into a bath of synthetic oil that conducts heat.¹¹²

Local governments can use tools such as CBAs to require data centers to use less water consumptive methods of cooling. Some states have introduced legislation to address various aspects of data center water usage:¹¹³

- California, Iowa, and Michigan are considering bills requiring data center operators to submit regular reports on water usage;¹¹⁴
- South Carolina and Kansas¹¹⁵ are considering regulations that would require data centers to use closed loop cooling systems or cooling technologies that do not rely on water evaporation;¹¹⁶
- Virginia is exploring ways to encourage use of reclaimed wastewater in cooling systems, such as through grant funds for using treated wastewater instead of potable, drinking water;¹¹⁷ and
- Georgia is considering legislation that would prohibit local governments from entering into NDAs with data center operators that would hide energy and water usage from the public.¹¹⁸

¹¹² Lincoln Institute of Land Policy, [Data Drain: The Land and Water Impacts of the AI Boom](#), October 17, 2025; EESI, [Data Centers and Water Consumption](#), June 25, 2025.

¹¹³ Multistate, [State Data Center Water Usage Legislation Gains Momentum](#), March 3, 2026.

¹¹⁴ Iowa Legislature, [HF 2690](#), Introduced February 16, 2026; California Legislature, [AB-1577 Data centers: reporting](#), Introduced January 12, 2026; Michigan Legislature, [Michigan Senate Bill 762](#), Introduced July 1, 2026.

¹¹⁵ As of April 10, 2026, the proposed bill died in committee.

¹¹⁶ South Carolina General Assembly, [Bill 4583: The South Carolina Data Center Responsibility Act](#), Introduced January 13, 2026; Kansas Legislature, [SB 400](#), Introduced January 27, 2026.

¹¹⁷ Virginia Legislature, [SB417](#), Introduced January 14, 2026.

¹¹⁸ Georgia General Assembly, [SB 421](#), Introduced January 22, 2026.

6. Harness Heat from Data Centers to Heat the Community

Type of Impact Addressed: Air Pollution, Water

Implementation By: County, State, Data Center Entities, Regional Grid Operators

Heat can be captured, moved through a network of underground pipes, and reused to heat nearby buildings. Heat reuse produced by data center operations can reduce power demand by 10 to 30 percent and reduce water consumption.¹¹⁹ In Europe, there are a few cities channeling heat recovered from data center operations to heat area homes and businesses in this manner.

- Mäntsälä, a municipality in Finland, recovers around 20,000 MWh of energy annually from data centers, enough to heat 2,500 homes;
- Heat recovered from a Microsoft data center being built near Helsinki, Finland, will provide heat to three neighboring municipalities;
- Google's data center facility in Hamina, Finland provides 80% of the heat necessary to heat the local community with no charge for the energy; and
- A project in London will recover heat from data centers to heat over 9,000 homes.¹²⁰

The Maryland General Assembly passed the WARMTH Act in 2024 directing certain gas companies to develop similar heating technology.¹²¹ Currently, two pilot projects are being reviewed by the state Public Service Commission.¹²² The pilot thermal energy networks would similarly move heat drawn from the earth through a shared underground pipe network to heat buildings.

¹¹⁹ A. Singh, [Thermal Energy Networks Turn Data Center Waste Heat into a Hot Commodity](#), May 5, 2026. See also, David Gardiner and Assoc, [Data Center Heat Reuse: The Opportunities for States](#), September 2025.

¹²⁰ World Economic Forum, [Here's how data centre heat can warm your home](#), June 18, 2025; The Energy Mix, [Google Data Centre to Supply 80% of Local District Heating Needs](#), May 29, 2024.

¹²¹ Maryland General Assembly, [SB0570](#), 2024.

¹²² Earthjustice, [Over 100 Tenants Submit Letter Urging Maryland Public Service Commission To Advance Delayed Networked Geothermal Pilot](#), July 8, 2026.

7. Require Reporting on Consumption of Resources

Type of Impact Addressed: Air Pollution, Water

Implementation By: County, State

Currently, federal law does not require data centers to report the quantity/source of energy and water consumed. Accurate information on data centers' water and energy consumption can help state and local officials gauge potential local impacts from data centers and guide potential mitigation measures.¹²³

Recommendations for transparent and publicly available disclosures regarding environmental impacts include:

- Expected water and energy use;
- Anticipated local environmental impacts including from land use conversion and pollution; and
- Potential harms like noise and light pollution (which can impact local wildlife in addition to nearby residents).¹²⁴

Note that Maryland's 2026 Utility RELIEF Act requires new large load customers (that will include many data centers) to report a variety of data to the Maryland PSC, including operating information, energy use, information on backup electricity generation, and water use and source of water.¹²⁵

Some advocate that jurisdictions commission independent studies on local energy and water impacts to look at both short- and long- term energy demands, water use, operational costs, and required infrastructure, while taking into consideration the growth of data centers and generative AI tools.¹²⁶

Virginia's Joint Legislative Audit and Review Commission (JLARC) commissioned a statewide study that highlighted challenges in the ability to meet energy demands associated with data center demand.¹²⁷

The Maryland General Assembly has requested a similar impact analysis for Maryland that is due to the governor and the legislature by September 1, 2026.

¹²³ E&E News by Politico, [States push to end secrecy over data center water use](#), December 8, 2026.

¹²⁴ Public Citizen, [Reining in Big Tech: Policy Solutions to Address the Data Center Buildout](#), December 8, 2025.

¹²⁵ See chapter 1 for more details on the RELIEF Act.

¹²⁶ Maryland Matters, [Lawmakers fear AI data centers will drive up residents' power bills](#), April 15, 2025; Public Citizen, [Reining in Big Tech: Policy Solutions to Address the Data Center Buildout](#), December 8, 2025.

¹²⁷ Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024.

8. Zoning Restrictions

Type of Impact Addressed: Agricultural Lands

Implementation By: County, State

Building data centers can alter local ecosystems and built environments if the building involves large scale land conversion, especially in agricultural lands.¹²⁸ Impacts can include:

- Indirect health and climate impacts due to loss of green space, such as increased heat exposure;
- Decreased capacity of natural green spaces' services of filtering water and air; and
- Replacing vegetation with impervious surfaces, which can impact water quality and increase flood risks.

Agricultural land is attractive to data center developers as they are often large, flat areas of land away from populous areas that already have access to electrical and water utilities. However, farmland conversion is generally permanent. Once farmland is converted to industrial use, it is rarely returned to production for crops. This is partly due to intensive soil remediation after industrial use, brownfield clean ups, and long rezoning processes.

Local governments can limit building of data centers in certain zones and/or requiring building only in certain zones, such as industrial zones.¹²⁹ However, careful consideration even within industrial zoned areas should be given to account for whether the local energy grid and water systems can support the facility without causing shortages and decreases in water quality for nearby residents.¹³⁰

For example, Prince William County in Virginia created the "Data Center Opportunity Zone Overlay District" to limit development of data centers to areas of the County with existing infrastructure that could adequately support the needs of data centers. This included measures such as proximity to high voltage power lines to support their energy needs and incorporating strategies to employ green technology to limit negative impacts to surrounding communities and the environment.¹³¹

¹²⁸ Large scale land conversion is changing a large area of land from one primary use to another, such as from agricultural to industrial use.

¹²⁹ U.S. Congress, [Data Centers and Their Energy Consumption: Frequently Asked Questions](#), May 12, 2026.

¹³⁰ Lightbox, [Zoning & Land Use for Data Centers](#), April 10, 2025.

¹³¹ Prince William County Zoning Code, [Part 509. - Data Center Opportunity Zone Overlay District](#). See chapter 7 for more information on this zoning overlay.

Chapter 5. Quality of Life and Neighborhood Impacts

This chapter synthesizes available research examining the impacts of data centers on the quality of life of community members living near these facilities. As the demand grows and land suitable for data center development decreases, these facilities are increasingly being built close to residential areas in some jurisdictions. An analysis of the Virginia data center industry found that almost one-third of data centers in the state are located within 200 feet of residentially zoned properties.¹ The image below shows an example of a data center in Ashburn, VA.



Source: Vantage Data Centers, Ashburn II Data Center Campus

Studies, local government analyses, and media sources related to existing and proposed data centers suggest that data center development can have a demonstrably negative impact on quality of life for neighboring community members with respect to views, light pollution, noise pollution, and access to green spaces and recreation. Because OLO does not know where future data centers will be located in Montgomery County, OLO cannot anticipate where these impacts will be felt in the County. Many jurisdictions have adopted design regulations, guidelines, and other measures to mitigate the potential negative impacts of data centers on neighboring communities.

A. Visual Impacts: Views and Light Pollution

Due to their form, height, and energy output, the appearance of data centers can cause visual impacts on adjacent neighborhoods. Local jurisdictions in the Washington metropolitan region have adopted requirements addressing visual impacts and light pollution from data centers. Examples of these requirements include:

- Screening, fencing, and landscape buffers;
- Minimum setbacks from residential areas;

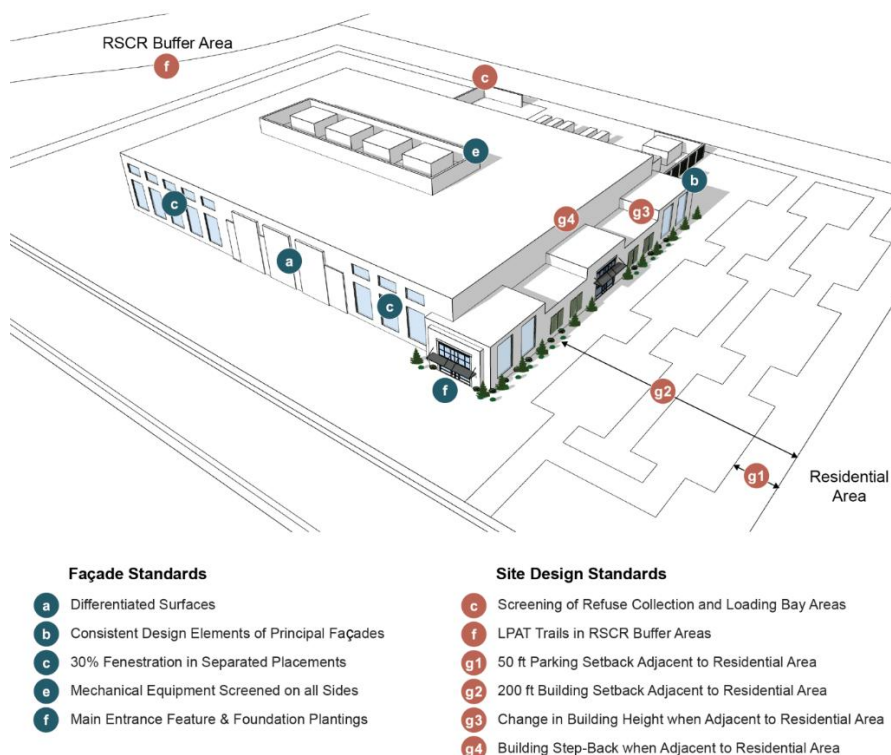
¹ Virginia Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024, page 77.

A Review of Information on the Impacts of Data Centers

- Maximum building height;
- Variation in building height and mass, differentiated surfaces, and windows; and
- Outdoor lighting standards to reduce spillover.

Based on an analysis by staff from the Henrico County (VA) Planning Department, the Board of Supervisors adopted a Data Center Comprehensive Plan Amendment in June 2025 that included development guidelines related to visual screening, distance requirements, height limitations, and changes to the building façade.² Staff identified these and other design components as potential issues to consider for mitigating impacts between data centers and adjacent residential uses. For example, year round landscaping or screen walls can reduce visual impacts from the principal mechanical buildings and accessory electric substations.³

Some localities have required that data centers comply with additional design guidelines to create breaks in the building façade through windows and doors. The image below from Loudoun County's zoning ordinance illustrates façade and site design standards that include mechanical screening, differentiated building surfaces, window placement, and change in building height and setback requirements when adjacent to residential areas.



Source: Loudoun County, [Zoning Ordinance Chapter 4: Use-Specific Standards > 4.06.02 Data Centers](#).

² Henrico County Planning Department, [Data Center Regulation Staff Analysis](#), May 1, 2025; [Data Center Comprehensive Plan Amendment](#), Henrico County Board of Supervisors (June 10, 2025).

³Henrico County Planning Department, [Data Center Regulation Staff Analysis](#), May 1, 2025.

Data centers often maintain continuous outdoor lighting for security on their facilities for security and parking purposes. Prince William County residents reported concerns with light pollution produced by neighboring data centers, with one resident saying, “we don't see the dark of night anymore.”⁴ Although Prince William County has some laws regulating data center design standards, the laws do not address light pollution. DarkSky International, a nonprofit with a mission to combat light pollution, recommends four measures to reduce impacts on light pollution from data centers:⁵

1. **“Avoid over-illumination.** Data centers often use ‘brute force’ lighting for security. However, light levels should be kept to the absolute minimum necessary.”
2. **Ensure any light beams are tight and targeted downward.** This prevents light from spilling horizontally into the neighborhood or creating glare that hinders security.
3. **Use smart lighting controls.** Use motion sensors and dimming to reduce light levels significantly during late-night hours when staff activity is minimal.
4. **Prioritize warmer color temperatures.** “Blue-white light scatters more easily in the atmosphere, increasing skyglow. Warmer color temperatures (up to 3000K) protect the circadian rhythms of local wildlife and residents.”

B. Noise Pollution

Research shows that noise from data centers can be disruptive to nearby homes, businesses, and other community facilities such as schools or libraries. Data centers usually emit constant noise from the humming of cooling fans, transformers, and HVAC ventilation.⁶ A report from Virginia’s Joint Legislative Audit and Review Commission on data centers described the persistent noise as an industrial-scale drone or hum similar to amplified house air conditioning, with levels ranging between 40 and 59 decibels.⁷ Smaller backup diesel generators reportedly reach 85 decibels and larger units can approach 100 decibels, equivalent to a motorcycle or jackhammer.⁸ Depending on terrain and wind conditions, low frequency hums and generator tests can be heard from up to a half mile to a mile away.⁹

To protect public health, the U.S. Environmental Protection Agency (EPA) has recommended maximum noise levels in outside environments stay at or below 55 decibels.¹⁰ Similar guidance from the World

⁴ C. Smith-Schoenwalder, [‘Living in Hell’: Data Center Neighbors Grapple With Noise, Air Pollution](#), US News, April 28, 2026.

⁵ R. Hartley, [Data center light pollution: DarkSky’s statement on responsible development](#), June 4, 2026.

⁶ LSARS, [How Loud Is a Data Center? How Far Does the Noise Travel?](#)

⁷ Virginia Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024, page 77.

⁸ C. Walker & I. Goldsmith, [From Energy Use to Air Quality, the Many Ways Data Centers Affect US Communities](#), World Resources Institute, February 17, 2026.

⁹ LSARS, [How Loud Is a Data Center? How Far Does the Noise Travel?](#)

¹⁰ [Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety](#), U.S. EPA (Mar. 1974).

Health Organization (WHO) on environmental noise recommends levels of outdoor noise remain between 40 and 54 decibels.¹¹

Studies have linked noise pollution with an increase in mental health concerns, such as stress-related disorders, particularly in sensitive individuals. Studies have found that children in noisy environments exhibit increased stress and behavioral issues. Additionally, noise pollution has been linked to decreased learning, lower reading comprehension, and concentration deficits.¹²

At least 15 data centers in Virginia (roughly ten percent of operational data center sites) appear to have generated noise that nearby residents regard as problematic, according to resident groups and government records.¹³ Residents in Loudoun County reported disruptions in sleep, headaches, and quality of life impacts because of a nearby data center.¹⁴ One resident of Prince William County described the sound of testing at the nearby data center as “an internal organ vibration that feels 100 percent unnatural.”¹⁵ Construction associated with data center development has also affected communities nearby. Virginia residents have reported increased noise and traffic from data center construction, with one neighborhood describing how frequent heavy truck traffic damaged its main access road and occasionally impeded school buses and emergency vehicles.¹⁶

The Virginia Department of Environmental Quality has a mandate to study how quiet data centers can be and publish an industry noise standard to be enforced starting in 2030. A data center in violation of the noise ordinance will face a fine of \$32,500 a day.¹⁷

The Environmental and Energy Study Institute recommends four measures to reduce impacts on noise pollution from data centers:¹⁸

- 1. Equipment Soundproofing.** Envelop server racks with foam and sound-deadening mats. Install acoustic tiles and foam panels on walls to absorb sound from IT equipment. Compressor sound blankets, fan silencers, and sound curtain barriers can help absorb noise from chillers and cooling equipment, particularly those located outside the data center. Sound attenuators and acoustical silencers can help muffle noise from air intakes in diesel engine generators.

¹¹ [Compendium of WHO and other UN guidance on health and environment, 2022 update: Chapter 11. Environmental noise](#), World Health Organization (2022).

¹² N. Gour, L. Ortiz, & E. Maibach E, [Health implications of the rapid rise of data centers in Virginia: an exploratory assessment](#), *Frontiers in Climate*, Vol 8, February 2026.

¹³ Virginia Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024, page 77.

¹⁴ C. Walker & I. Goldsmith, [From Energy Use to Air Quality, the Many Ways Data Centers Affect US Communities](#).

¹⁵ C. Smith-Schoenwalder, ['Living in Hell': Data Center Neighbors Grapple With Noise, Air Pollution](#), *US News*, April 28, 2026.

¹⁶ Virginia Joint Legislative Audit and Review Commission, [Data Centers in Virginia](#), 2024, page 77.

¹⁷ S. Heckt, [Virginia has a new two-year budget. Here's what lawmakers now require of data centers.](#), *News From the States*, June 30, 2026.

¹⁸ M. Yañez-Barnuevo, [Communities Are Raising Noise Pollution Concerns About Data Centers](#), *Environmental and Energy Study Institute*, March 23, 2026.

2. **Building Soundproofing.** Erecting acoustic barriers, such as insulated, modular metal walls around the perimeter of the data center and on roofs, can mitigate high-frequency noise from cooling units, generators, and chillers. Planting bushes, shrubs, and trees around data centers can help reduce noise by creating a natural shield around the facility. Natural barriers can also enhance data centers' visual appeal and provide environmental benefits.
3. **Quieter Cooling Technologies.** Immersion cooling, which bathes the servers in synthetic liquid-cooling fluid, eliminates the need for large, noisy fans and cooling equipment and is also more energy-efficient.
4. **Thoughtful Land Use Planning.** Zoning ordinances can classify data centers as industrial facilities that must be located far from residential areas.

C. Access to Green Spaces and Recreation

Hyperscale data centers require large amounts of land, and companies sometimes look to convert areas near natural green spaces and agricultural lands into data center sites. Research from the Piedmont Environmental Council shows as of 2024, data centers in Northern Virginia currently occupy about 6,200 acres of land. Proposed projects throughout the state of Virginia would cover nearly 21,000 acres, more than tripling the current footprint in Northern Virginia.¹⁹



Data centers are increasingly being constructed near residential housing and public green spaces. This one is located along the Washington and Old Dominion Rail Trail in Ashburn, VA. Source: [Piedmont Environmental Council](#). Photo by Hugh Kenny.

¹⁹ N. Gour, L. Ortiz, & E. Maibach E, [Health implications of the rapid rise of data centers in Virginia: an exploratory assessment](#).

Developers may seek agricultural land for data centers because it often includes large, contiguous, and flat tracts of land that already have access to electrical and water utilities, lowering upfront site development costs.²⁰ A 2026 study published in the journal *Frontiers in Climate* found data center development in Northern Virginia is moving towards rural land near national parks and agricultural uses.²¹ For example, in 2022, Prince William County approved a Digital Gateway planning proposal to open more than 1,000 acres of rural land to data center development. This area shares a border with two federal and state parks, Manassas Battlefield National Park and Conway-Robinson Memorial State Forest.²² A judge halted the project in August 2025 because the county had not made development plans, ordinances, or amendments available to the public.²³

Elsewhere, water needs for data centers are competing with drinking water supply and recreational uses, as illustrated by the conflict over draw limits at Kerr Lake. Kerr Lake, a 50,000 acre reservoir on the border of North Carolina and Virginia, may be tapped to support data center development in neighboring Franklin County.²⁴ Franklin County is requesting 15.7 million gallons of water per day from the reservoir's conservation pool, nearly as much as the entire Kerr Lake Regional Water System is currently authorized to draw. An analysis produced by Vance County, North Carolina that incorporated findings from the U.S. Army Corps of Engineers concluded that benefits from a recreation economy far outweigh benefits from data center production in terms of permanent jobs, water impact, community identity, revenue distribution, impact on resident property value, and adaptive reuse potential.²⁵

²⁰ A. Higgins & B. Nelson, [Balancing Data Center Growth with American Agriculture](#), American Farm Bureau Federation, April 23, 2026.

²¹ N. Gour, L. Ortiz, & E. Maibach E, [Health implications of the rapid rise of data centers in Virginia: an exploratory assessment](#).

²² M. Barthel, [Prince William County Supervisors Approve Plan To Allow Data Centers Near Manassas Battlefield](#), DCist.com, November 3, 2022.

²³ C. Muzyk & J. Palermo, [BREAKING: Judge overturns Prince William Digital Gateway](#), Prince William Times, August 7, 2025.

²⁴ E. Ellis, [Franklin County officials confirm county has been contacted by data center companies](#), WSLs 10 News, May 12, 2026.

²⁵ Vance County, [Kerr Lake, Data Centers, and the Case for Recreation](#), March 27, 2026.

Chapter 6. Data Centers and Racial Equity and Social Justice

Environmental justice is an area of racial equity and social justice (RESJ) that focuses on the just treatment and meaningful involvement of all people in environmental decisions, ensuring full protection from disproportionate environmental and health hazards, and equitable access to a healthy, sustainable, and resilient environment. This focus was born from the Environmental Justice Movement to combat environmental racism – the disproportionate exposure of Black, Indigenous, and other People of Color (BIPOC) and people with low incomes throughout the U.S. to harmful environmental conditions. Seeing familiar patterns of environmental racism, RESJ leaders, advocates, and organizers have identified the rapid expansion of large-scale data centers as the next major front of the Environmental Justice Movement.¹

This chapter describes local and national context on environmental justice and the impact of large-scale data centers on RESJ. This chapter is presented in three sections:

- **Section A** describes environmental justice, including the Environmental Justice Movement, racial inequities that characterize environmental racism, and the environmental justice context of data centers.
- **Section B** describes the environmental justice context of Montgomery County, including local economic and health outcomes disaggregated by race and ethnicity and existing environmental and social burdens in County neighborhoods.
- **Section C** describes the RESJ impact of large-scale data centers based on research from RESJ advocates and organizers and promising practices to mitigate the negative RESJ impacts of large-scale data centers.

Four key findings emerge from the information reviewed in this chapter:

- In line with other struggles throughout the Environmental Justice Movement, the recent proliferation of large-scale data centers is disproportionately impacting BIPOC and low-income communities across the U.S;
- Black and Latinx community members in the County are most susceptible to being overburdened by cumulative impacts from large-scale data centers;
- Large-scale data centers have impacts on the environment, utility costs, public health and community engagement that can disproportionately burden BIPOC community members while providing limited economic development benefits; and

¹ [“Episode 01: AI, Data Centers, and the New Frontline of Racial Justice Organizing.”](#) Momentum: A Race Forward Podcast, Race Forward, May 15, 2026.

- Promising practices that can help mitigate the negative RESJ impacts of large-scale data centers include halting data center development, increasing transparency and community engagement in data center development and enacting environmental justice and cumulative impacts assessments and enforceable community benefits agreements (CBAs) for data center development projects, among others.

A. Environmental Justice Overview

Environmental justice is the just treatment and meaningful involvement of all people in environmental decisions, ensuring full protection from disproportionate environmental and health hazards, and equitable access to a healthy, sustainable, and resilient environment.² This focus was born from the decades-long Environmental Justice Movement to combat environmental racism – the disproportionate exposure of BIPOC and people with low incomes throughout the U.S. to harmful environmental conditions.³

The seeds of the modern Environmental Justice Movement were planted in the late 1970s on the heels of the Civil Rights Movement. In 1979, attorney Linda McKeever Bullard filed a civil rights lawsuit to challenge the siting of a landfill in Northwood Manor, a historically Black neighborhood in Houston, TX. While unsuccessful, the suit was the first in a long line of civil rights cases seeking environmental justice. The suit also uncovered research from Bullard's husband, Dr. Robert Bullard, on wide racial inequities in the siting of Houston's toxic waste facilities.⁴ Dr. Bullard would go on to lead and inspire future research that would gain him recognition as the "father of environmental justice."⁵

Several years after the Northwood Manor case, local protests in rural North Carolina would launch environmental justice into the national spotlight. In the late 1970s, North Carolina's governor announced plans to site a toxic landfill in Warren County. At 60 percent, the county had the largest share of Black people in the state. Recognizing the racial inequity of the siting decision, local and national activists, including civil rights veterans like Reverend Leon White and Reverend Ben Chavis, organized a multiracial coalition to challenge the move. In 1982, over 500 people were arrested in Warren County across several weeks of nonviolent protests to stop the landfill.⁶

² ["Environmental Justice Factsheet,"](#) Center for Sustainable Systems, University of Michigan, 2025.

³ Maudlyne Ihejirika, ["What Is Environmental Racism?"](#) National Resources Defense Council, May 24, 2023.

⁴ Zachary Outzen, ["Foreword to Environmental Justice in America: Where We Have Been & Can Go,"](#) William & Mary Environmental Law and Policy Review, 2022; Linda McKeever Bullard and Luke Cole, ["A Pioneer in Environmental Justice Lawyering: A Conversation with Linda McKeever Bullard,"](#) Race, Poverty & the Environment, 1994.

⁵ ["Who We Are: Our Founder,"](#) Bullard Center for Environmental and Climate Justice, Texas Southern University.

⁶ Stephen Fletcher, et al, ["We Birthed the Movement: The Warren County PCB Landfill Protests, 1978-1982,"](#) University Library, University of North Carolina at Chapel Hill, 2022; Yiheng Wang, ["Warren County and the Birth of Environmental Justice: From Local Protest to a National Movement,"](#) Critical Debates in Humanities, Science and Global Justice, 2025.

While the state ultimately proceeded with the toxic landfill, the Warren County protests sparked the national Environmental Justice Movement. Since then, environmental justice struggles across the country have revealed several racial inequities that characterize environmental racism. These include:

- **Inequitable siting of hazardous facilities.** The United Church of Christ's (UCC) landmark 1987 report, *Toxic Wastes and Race in the United States*, found race was the primary factor driving the location of hazardous waste facilities across the U.S.⁷ Twenty years later, the update to the report found the disparities were even greater than previously reported.⁸ Research consistently shows BIPOC and low-income communities are disproportionately exposed to environmental hazards where they live, work, play, and go to school.⁹ The siting of hazardous facilities – such as major roadways, toxic waste sites, landfills, and chemical plants – in BIPOC communities is a defining feature of residential segregation.¹⁰
- **Lack of engagement with BIPOC communities in environmental decisions.** Because of structural racial inequities like the racial wealth gap, BIPOC communities often have less time, resources, and political connections than White communities to influence environmental decisions.¹¹ Further, government decision-making processes often exclude BIPOC voices.¹² Together, these make BIPOC communities more susceptible to harmful environmental decisions.
- **Inequitable environmental protections and benefits and disproportionate environmental impacts.** Systematic underenforcement of existing environmental laws often leaves BIPOC communities less protected from harmful environmental conditions. Further, because of inequities in public and private investments, BIPOC communities frequently lack amenities that provide environmental benefits, such as trees, parks, open spaces, and access to healthy food.¹³ These inequities, in turn, drive disproportionate environmental impacts such as the climate gap,

⁷ Benjamin Chavis and Charles Lee, [“Toxic Wastes and Race in the United States: A National Report on the Racial and Socio-Economic Characteristics of Communities with Hazardous Waste Sites,”](#) Commission for Racial Justice, United Church of Christ, 1987.

⁸ Robert Bullard, et al., [“Toxic Wastes and Race at Twenty 1987-2007,”](#) Justice & Witness Ministries, United Church of Christ, March 2007.

⁹ Paul Mohai, et al., [“Environmental Justice,”](#) Annual Review of Environment and Resources, July 28, 2009; [“Environmental Justice Factsheet,”](#) Center for Sustainable Systems, University of Michigan, 2025; Joel Kaufman and Anjum Hajat, [“Confronting Environmental Racism,”](#) Environmental Health Perspectives, May 2021; Paul Mohai, et al., [“Which came first, people or pollution? Assessing the disparate siting and post-siting demographic change hypotheses of environmental justice,”](#) Environmental Research Letters, November 18, 2015.

¹⁰ Genesis Dacosta, [“Poisoned by Policy: Environmental Racism in the Modern Legal System,”](#) Columbia Black Pre-Law Journal, Columbia University, January 7, 2026; Bongki Woo, et al., [“Residential Segregation and Racial/Ethnic Disparities in Ambient Air Pollution,”](#) Race and Social Problems, October 2018.

¹¹ Mohai, et al., [“Environmental Justice.”](#)

¹² [“Yale Experts Explain Environmental Justice,”](#) Yale Sustainability, Yale University, October 1, 2020.

¹³ Ibid.

where BIPOC experience the most harmful effects of climate change.¹⁴ For example, less green space exposes BIPOC communities to more extreme heat from the urban heat island effect.¹⁵

- **Cumulative impacts.** BIPOC communities experience cumulative impacts as they become overburdened with hazardous facilities and other stressors. Cumulative impacts are the combined effects of chemical (environmental) and non-chemical (social) stressors on health, well-being, and quality of life. Together, environmental and social stressors are linked to worse health outcomes than environmental stressors alone.¹⁶ For example, one 2024 Stanford study found increased exposure to air pollution compounded by stressors like poverty and housing instability make Black people across the U.S. more likely to die from the effects of air pollution.¹⁷

In 1991, over one thousand BIPOC leaders from across the U.S. gathered for the First National People of Color Environmental Leadership Summit.¹⁸ Sponsored by the UCC's Commission for Racial Justice, the summit resulted in the creation of the foundational Principles of Environmental Justice. Some principles include:¹⁹

- **Just policy** free from discrimination and bias, including universal protection from environmental hazards and fair access to environmental resources;
- **Ethical and responsible uses of land** and renewable resources that promote sustainability;
- **Equitable participation of impacted communities** at all levels of decision-making, from needs assessment and planning, to implementation, enforcement, and evaluation; and
- **Full compensation** for communities impacted by environmental injustices.

These principles continue to ground the Environmental Justice Movement in combating environmental racism to this day. They have also served as the foundation for the subsequent Climate Justice and Energy Justice movements, which respectively aim to address the disproportionate harm of climate change and the energy system on BIPOC communities.²⁰

¹⁴ Alique Berberian, et al., "[Racial Disparities in Climate Change-Related Health Effects in the United States](#)," Current Environmental Health Reports, May 28, 2022.

¹⁵ Nambi Ndugga and Samantha Artiga, "[Continued Rises in Extreme Heat and Implications for Health Disparities](#)," KFF, August 24, 2023; Austin Clark, et al., "[Identifying groups at-risk to extreme heat: Intersections of age, race/ethnicity, and socioeconomic status](#)," Environment International, September 2024.

¹⁶ Nicolle Tulve, et al., "[Challenges and opportunities for research supporting cumulative impact assessments at the United States environmental protection agency's office of research and development](#)," The Lancet Regional Health – Americas, February 2024; "[Cumulative Impacts Policies: A Promising Approach to Environmental Protections](#)," Union of Concerned Scientists, October 16, 2024.

¹⁷ Nina Bai, "[More Black Americans die from effects of air pollution](#)," Stanford Medicine, July 16, 2024.

¹⁸ Brooks Berndt, "[30th Anniversary: The First National People of Color Environmental Leadership Summit](#)," United Church of Christ, March 25, 2021.

¹⁹ "[Principles of Environmental Justice](#)," United Church of Christ, October 27, 1991.

²⁰ "[What is Climate Justice?](#)" Center for Climate Justice, University of California; Uche O. Ajene, "[What Is Energy Justice? A Comprehensive Introduction](#)," Initiative for Energy Justice, June 10, 2025.

Data Centers and Environmental Justice. As described in more detail in Section C, large-scale data centers can have significant impacts on the environment, utility costs, public health, and community engagement. With the recent boom in data center development, there is mounting evidence these impacts are disproportionately falling on BIPOC and low-income communities throughout the U.S. For example, recent studies have found:

- Nine out of the top ten counties in the U.S. most affected by data center expansion are low-income communities that are predominantly Black.²¹
- Nationally, communities within one mile of data centers regulated by the U.S. Environmental Protection Agency (EPA) tend to be disproportionately BIPOC. Further, BIPOC residents living near data centers tend to experience higher air pollution rates than White residents living near data centers.²²
- Forty percent of people living within three miles of proposed gas plants to power data centers in the U.S. are from households with low incomes.²³
- In the South, the top region for data center development,²⁴ an analysis of 178 existing and planned data centers across five states found they are in neighborhoods where BIPOC residents are a greater portion of the population compared to neighborhoods in those states without data centers.²⁵

Seeing familiar patterns of environmental racism, RESJ leaders, advocates, and organizers have identified the rapid expansion of large-scale data centers as the next major front of the Environmental Justice Movement.²⁶ Across the country, BIPOC are organizing to resist data center development in their communities.²⁷ This latest struggle is bringing renewed attention to a question that has been frequently raised throughout the Environmental Justice Movement: who benefits from development that promises “progress” for society, and who is forced to bear its costs.

In August 2025, the National NAACP convened nearly 100 partners to develop the Data Center Frontline Framework. Rooted in the Principles of Environmental Justice and the Jemez Principles for

²¹ Danny Caine and Reggie Rucker, [“The Environmental Inequity of AI,”](#) Institute for Local Self-Reliance, December 12, 2024, citing Shaolei Ren and Adam Wierman, [“Mitigating the Public Health Impacts of Data Centers,”](#) Harvard Business Review, November 5, 2025.

²² Leila Marie Hampton and Eric Nost, [“Communities Close to EPA-Regulated Data Centers Face Heightened Air Pollution,”](#) Environmental Data and Governance Initiative, October 28, 2025.

²³ [“74 Gas Power Plants Proposed for U.S. Data Centers Could Release as Much Climate Pollution as Australia,”](#) Environmental Integrity Project, July 1, 2026.

²⁴ Skyler Seets and Kaitlyn Radde, [“Most new data centers in the U.S. are coming to rural areas,”](#) Pew Research Center, April 13, 2026.

²⁵ [“The People Say No: Resisting Data Centers in the South,”](#) MediaJustice, September 9, 2025, pg. 27 and OLO communication with MediaJustice staff on July 7, 2026.

²⁶ [“Episode 01: AI, Data Centers, and the New Frontline of Racial Justice Organizing,”](#) Momentum: A Race Forward Podcast, Race Forward, May 15, 2026.

²⁷ Russell Contreras, [“AI boom fuels “environmental justice” fears in communities of color,”](#) Axios, December 8, 2025.

Democratic Organizing, the framework aims to be a unifying guide for communities working to stop harmful data centers and build cleaner alternatives.²⁸ Figure 6-1 includes the Data Center Frontline Framework. Of note, in *The People's Report* described more in Section C, the NAACP and Center for Engagement, Environmental Justice and Health called on officials in neighboring Prince George's County to use the framework to guide their next steps on data center development.²⁹

²⁸ [“The People's Report: A Gap Analysis of Data Center Infrastructure in Prince George's County, Maryland,”](#) NAACP and CEEJH, 2026, pg. 7; Yanit Asamnew, [“Q&A with NAACP: Addressing the growing environmental harms of AI data centers,”](#) Public Health Newswire, American Public Health Association, March 13, 2026.

²⁹ [“The People's Report,”](#) NAACP and CEEJH, pg. 7

Figure 6-1. Data Center Frontline Framework

Our health and the environment are sacred. No community should be forced to sacrifice clean air, clean water, or safe homes so that corporations and billionaires can build energy-hungry facilities. We demand that public health protections be explicit, with independent monitoring, healthcare access, and investment in preventing harm.

Communities most affected must lead. Organizing must start from the ground up, with residents shaping decisions, monitoring, and enforcement. Those directly impacted by pollution, displacement, or job loss from data centers must be the primary voices at the table. Those directly impacted should not have to bear the brunt of subsidizing data center buildouts. We also demand that utilities remain affordable for all.

Jobs cannot justify harm. Temporary construction contracts or outsourced tech work do not replace stable, living-wage employment. Data centers accelerate worker displacement through automation and artificial intelligence, and without a just transition framework. Communities demand real economic justice through investments in housing, renewable energy, broadband, community ownership, and small business development.

Accountability must be enforceable. Voluntary promises are not enough. We demand that any commitments made must be legally binding and publicly disclosed, with transparent data on water use, energy consumption, emissions, subsidies, and corporate ownership from the beginning of a project proposal through its operation. There must also be legally binding standards for water efficiency and energy use for data center operations to ensure that precious resources are not depleted. Corporations can no longer receive tax breaks for the harm they cause communities. We demand corporate tax accountability for data center buildouts in communities. We also demand that enforcement be led by communities with clear authority to halt harmful operations.

We reject false solutions and fossil fuel dependency. Large-scale data centers are deepening reliance on fossil fuels and straining fragile energy grids. We demand community-owned renewable energy, decentralized projects, and planning that protects both today's neighborhoods and future generations.

Infrastructure must be community-led. Instead of massive corporate hubs, we envision local, decentralized, and public-interest technology and energy projects, including microgrids, broadband expansion, and shared spaces that strengthen communities rather than exploit them. The community must own these projects to ensure that they fully receive the benefits of technology shifts.

Interconnected harms require interconnected solutions. Data centers cannot be separated from the mining of rare earth minerals, fossil fuel expansion, surveillance systems, or displacement. Organizers must name these links as civil rights issues, connect struggles across topics, and resist efforts to divide or dilute our vision.

Solidarity builds power. We honor the Jemez Principles by committing to inclusivity, just relationships, and mutual support, including in rural and urban communities, unions, policy, housing, labor, and grassroots groups, environmental and climate justice spaces, digital equity advocates, and all other spaces that

Source: [“Frontline Framework Community Guiding Principles,”](#) NAACP.

B. Environmental Justice in Montgomery County

As described in more detail in Section C, large-scale data centers can have significant impacts on the environment, utility costs, public health, and community engagement. Because of environmental racism and racial inequities in areas like economic stability, health, and housing, BIPOC communities are particularly susceptible to being overburdened by cumulative impacts from data centers. This section describes key economic, health, and environmental justice characteristics in the County to understand how data center development could impact local community members by race and ethnicity.³⁰

1. Local Economic and Health Outcomes by Race and Ethnicity

Economic stability. Racial disparities in income, poverty, and housing cost burden show Black and Latinx community members are particularly susceptible to experiencing economic instability from potential increases in utility costs from data center development.

Locally, households with lower incomes are disproportionately Black and Latinx. As shown in Table 6-1, Black and Latinx households are overrepresented among households with incomes less than \$50,000 and \$100,000 a year. Conversely, they are underrepresented among households with incomes over \$150,000 a year. Notably, White households are underrepresented among households with incomes less than \$50,000 a year and comprise most households with incomes over \$150,000 a year.

Table 6-1. Percent of Households by Household Income Level and Race and Ethnicity, Montgomery County

Race or Ethnicity	\$0-\$49,999	\$50,000-\$99,999	\$100,000-\$149,000	\$150,000 or More	Total Households
Asian	14.2%	12.3%	14.4%	16.4%	14.8%
Black	27.8%	25.3%	20.5%	11.5%	18.7%
Native American	0.6%	0.7%	0.7%	0.2%	0.5%
Pacific Islander	0.1%	0.1%	0.0%	0.0%	0.1%
White	36.2%	39.2%	45.0%	59.6%	48.8%
Latinx	20.2%	21.1%	18.0%	10.1%	15.5%

Source: OLO analysis of [Table B19001](#), 2024 American Community Survey 5-Year Estimates, Census Bureau.

As shown in Table 6-2, the median household income in the County is \$132,450. Black and Latinx households in the County each have median household incomes that are more than \$30,000 below the

³⁰ Race is inclusive of Latinx origin for data points in Section B, unless otherwise noted. Estimates for Native American and Pacific Islander community members throughout this section have large margins of error.

County median. Meanwhile, Asian and White households have median household incomes that are each \$15,000 and \$32,000 greater than the County median.

Table 6-2. Median Household Income by Race and Ethnicity, Montgomery County

Race or Ethnicity	Poverty Rate
Asian	\$147,950
Black	\$92,979
Native American	\$92,587
Pacific Islander	\$122,500
White	\$164,638
Latinx	\$98,644
County	\$132,450

Source: [Table S1903](#), 2024 American Community Survey 5-Year Estimates, Census Bureau.

Table 6-3 shows Black and Latinx community members are also more likely to live below the poverty level. Locally, poverty rates for Black and Latinx community members are respectively 11.8 and 11.6 percent, nearly three times the poverty rate of White community members.

Table 6-3. Poverty Rates by Race and Ethnicity, Montgomery County

Race or ethnicity	Poverty Rate
Asian	6.3%
Black	11.8%
Native American	10.1%
Pacific Islander	14.9%
White	4.1%
Latinx	11.6%
County	7.5%

Source: [Table S1701](#), 2024 American Community Survey 5-Year Estimates, Census Bureau.

Further, Table 6-4 shows Black and Latinx households are more likely to be housing cost burdened – or to spend 30 percent or more of their income on housing. Black and Latinx renter households experience especially high burdens, respectively having cost burden rates of 54 and 55 percent.

Table 6-4. Rate of Community Members Experiencing Housing Cost Burden by Race and Ethnicity, Montgomery County

Race or Ethnicity	Housing Cost Burden Rate (Renters)	Housing Cost Burden Rate (Homeowners)
Asian	37.1	25.5
Black	54.4	33.1
White	37.1	23.0
Latinx	55.5	27.1
County	46.8	25.0

Source: [Table S0201](#), 2024 American Community Survey 1-Year Estimates, Census Bureau.

Health and health care. Section C describes environmental impacts seen in communities with data centers, which includes increased levels of air and noise pollution that are linked to various health conditions. Racial disparities in health outcomes make Black and Latinx community members particularly susceptible to experiencing negative health impacts associated with data center development. According to the County’s most recent chronic disease report:³¹

- Black community members have the highest mortality and emergency room (ER) visit rates for heart disease, cerebrovascular disease, and diabetes, and the highest ER visit rate for chronic lower respiratory disease;
- Black community members have the highest disease burden for lung and bronchus, colorectal, breast, and prostate cancers and the highest percent late-staged diagnosis for colorectal and breast cancers; and
- Asian and Latinx community members respectively have the highest percent late-staged diagnosis for lung and bronchus, and prostate cancers.

The County’s most recent health equity report shows compared to White community members, Black, Latinx, and Asian community members respectively experience disparities in 24 (72 percent), 16 (48 percent), and 9 (27 percent) of 33 core measures. These disparities include health outcomes that are specifically of concern with air pollution from data centers, including asthma-related ER visits in children.³²

³¹ [“Chronic Diseases in Montgomery County, MD 2010-2023,”](#) Montgomery County Department of Health and Human Services, September 2025, pgs. 13-14. Race is not inclusive of Latinx origin for these data points.

³² [“Health Equity in Montgomery County, MD: Healthy Montgomery Core Indicators 2015-2023,”](#) Montgomery County Department of Health and Human Services, February 2026, pgs. 16-17. Race is not inclusive of Latinx origin for these data points; Karen Feldscher, [“Analyzing air pollution health, economic risks from AI data centers,”](#) Harvard T.H. Chan School of Public Health, April 8, 2026.

Table 6-5 shows there are also wide racial and ethnic disparities in health insurance coverage. Locally, Black and Latinx community members have uninsured rates between two and five times that of White community members.

Table 6-5. Uninsured Rates by Race and Ethnicity, Montgomery County

Race or Ethnicity	Uninsured Rate
Asian	3.7%
Black	6.2%
Native American	18.0%
Pacific Islander	17.0%
White	2.7%
Latinx	20.3%
County	7.0%

Source: [Table S2701](#), 2024 American Community Survey 5-Year Estimates, Census Bureau.

2. Neighborhood-Level Cumulative Impacts

Because of racial inequities like residential segregation, different neighborhoods in the County experience different levels of risk to being overburdened by data center development. In Maryland, two environmental justice (EJ) tools have been developed to measure and map existing cumulative impacts – environmental and social burdens – at the neighborhood-level for communities across the state. The two tools are:

- **The Center for Engagement, Environmental Justice and Health (CEEJH) EJ Score**, referred to as **MDEJSCREENV3.3**. The CEEJH EJ score for each census tract represents existing cumulative impact burdens based on five domains: climate change, environmental exposure, population characteristics, environmental effects and health.³³
- **The Maryland Department of the Environment (MDE) EJ Score**, referred to **MDEnviroScreen**. The MDE EJ score for each census tract represents existing cumulative impact burdens based on three domains: pollution burden exposure, pollution burden environmental effects, and sensitive populations, including socioeconomic factors like low-income percentile. State law requires MDEnviroScreen to be used as part of MDE’s permitting process.³⁴

EJ scores from each tool are a numerical score that show how neighborhoods across Maryland compare with respect to existing cumulative impacts. For example, an EJ score of 90 means that a

³³ [“About MDEJSCREENV3.3,”](#) Center for Engagement, Environmental Justice and Health.

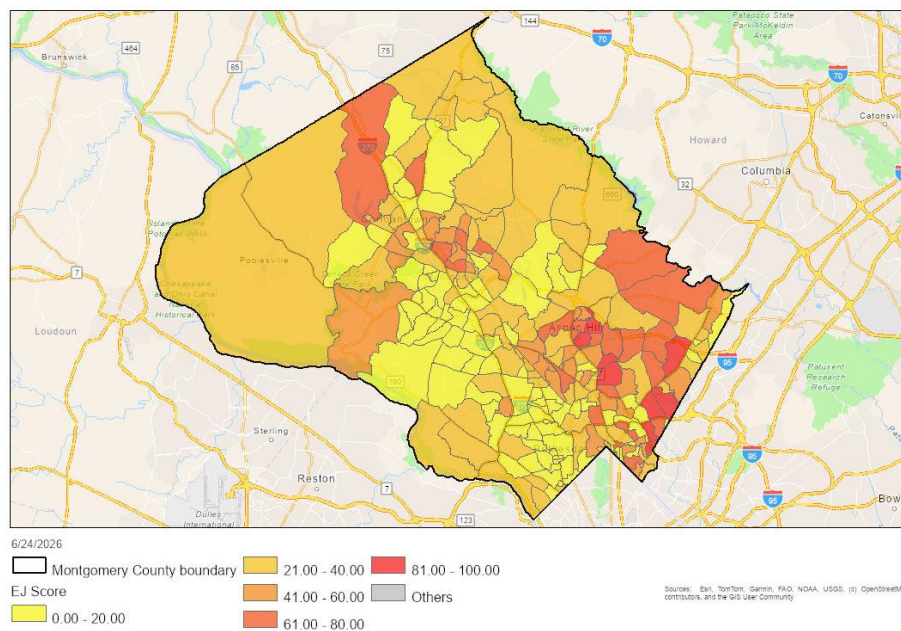
³⁴ [“MDEnviroScreen Documentation,”](#) Maryland Department of the Environment, pg. 3.

neighborhood faces a greater cumulative impact burden than 90 percent of census tracts in the state.³⁵ Locating data centers in neighborhoods that have high EJ scores can worsen cumulative impacts.

The next two figures show maps with EJ scores from MDEJSCREENV3.3 and MDEnviroScreen for census tracts in the County. Following each map is a table that lists the census tracts in Montgomery County with EJ scores of 70 or above. These tracts face a greater cumulative impact burden than 70 percent of tracts across Maryland. The tables also show which groups are overrepresented in each tract by race or ethnicity.

Collectively, the data show that neighborhoods with high MDEJSCREENV3.3 EJ scores are primarily concentrated in Black and Latinx neighborhoods in Mid-County (Wheaton/Aspen Hill), East County (White Oak/Fairland), Down County (Silver Spring) and Up-County (Gaithersburg). Moreover, neighborhoods with high MDEnviroScreen EJ scores are primarily concentrated in Black and Latinx neighborhoods in Down County (Silver Spring) and East County (White Oak). Of note, five census tracts across Down County and East County have high EJ scores based on MDEJSCREENV3.3 and MDEnviroScreen. These are marked with an asterisk in Tables 6-6 and 6-7. These neighborhoods are disproportionately Black, Latinx, and/or Asian.

Figure 6-2. Center for Engagement, Environmental Justice and Health EJ Scores (MDEJSCREENV3.3), Montgomery County



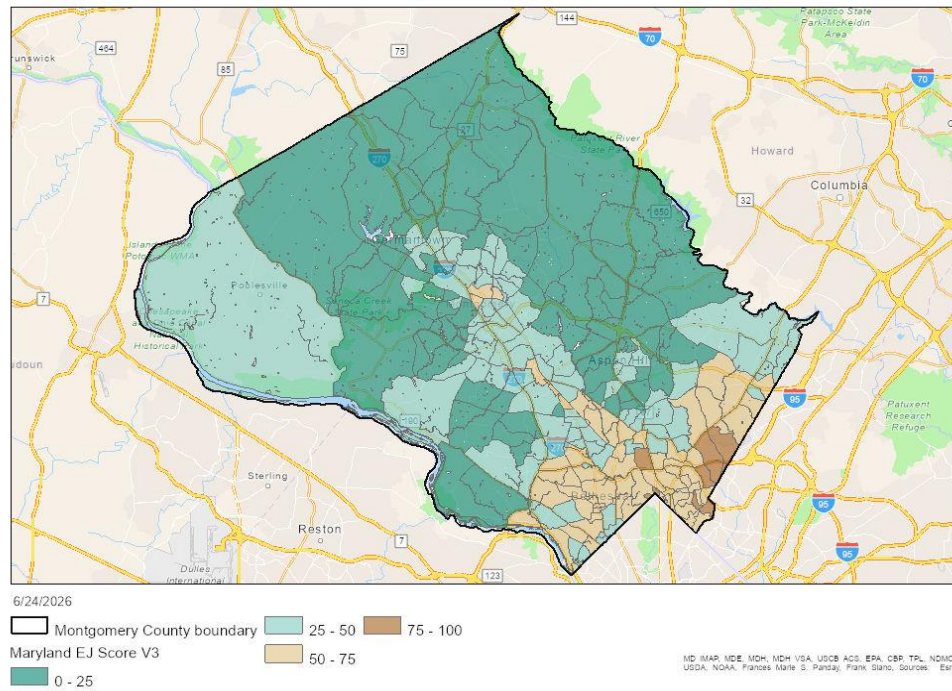
Source: [Center for Engagement, Environmental Justice and Health](#).

³⁵ See Appendix I for a guide from CEEJH that compares indicators included in MDEJSCREENV3.3 and MDEnviroScreen. Of note, while MDEJSCREENV3.3 includes measures of race and ethnicity in its EJ score, MDEnviroScreen does not. Under population characteristics, MDEJSCREENV3.3 EJ Score includes the Social Vulnerability Index (SVI), which measures BIPOC representation, among other characteristics. For more info on SVI, refer to [“Social Vulnerability Index”](#) Geospatial Research, Analysis, and Services Program, Center for Disease Control, July 22, 2024.

Table 6-6. Census Tracts with CEEJH EJ Scores (MDEJSCREENV3.3) of 70 or Greater, Montgomery County

Tract Name	EJ Score	Community	Area	Disproportionality
Tract 7032.07	95.9	Kemp Mill, Glenmont, Wheaton	Mid-County/Wheaton	Latinx
Tract 7032.22	93.1	Glenmont	Mid-County/Wheaton	Black, Latinx
Tract 7015.09*	92.7	Hillandale, White Oak	East County/White Oak	Black, Latinx
Tract 7032.14	91.9	Aspen Hill	Mid-County/Aspen Hill	Latinx, Black
Tract 7015.05*	90.1	White Oak, Burnt Mills, Hillandale	East County/White Oak	Black, Latinx
Tract 7032.20	89.3	Layhill, Aspen Hill	Mid-County/Aspen Hill	Black
Tract 7021.01*	86.8	Silver Spring	Down-County/Silver Spring	Latinx, Black
Tract 7014.14	81.8	Fairland	East County/Fairland	Black
Tract 7020*	80.3	Takoma Park, Silver Spring	Down-County/Silver Spring	Latinx
Tract 7016.02*	77.9	Silver Spring	Down-County/Silver Spring	Latinx, Asian
Tract 7007.33	77.3	Montgomery Village, Gaithersburg	Up-County/Gaithersburg	Black, Latinx
Tract 7008.12	76.5	Flower Hill, Montgomery Village	Up-County/Gaithersburg	Asian
Tract 7032.09	76.2	Kemp Mill, Wheaton	Mid-County/Wheaton	Latinx, Black
Tract 7035.01	75.9	Wheaton	Mid-County/Wheaton	Latinx, Black
Tract 7015.03	75.7	White Oak, Colesville	East County/White Oak	Black
Tract 7032.16	74.5	Leisure World	Mid-County/Aspen Hill	Black
Tract 7007.30	73.8	Redland, Flower Hill	Up-County/Gaithersburg	Latinx
Tract 7018	72.5	Silver Spring, Takoma Park	Down-County/Silver Spring	Black

Figure 6-3. Maryland Department of Environment EJ Scores (MDEnviroScreen), Montgomery County



Source: [Maryland Department of the Environment](#).

Table 6-7. Census Tracts with MDE EJ Scores (MDEnviroScreen) of 70 or Greater, Montgomery County

Tract Name	EJ Score	Community	Area	Disproportionality
Tract 7015.09*	85.1	Hillandale, White Oak	East County/White Oak	Black, Latinx
Tract 7016.02*	80.9	Silver Spring	Down-County/Silver Spring	Latinx, Asian
Tract 7017.02	80.9	Takoma Park	Down-County/Silver Spring	Black
Tract 7015.05*	79.2	White Oak, Burnt Mills, Hillandale	East County/White Oak	Black, Latinx
Tract 7017.03	78.7	Takoma Park	Down-County/Silver Spring	Black
Tract 7040	77.2	Wheaton, Forest Glen	Mid-County/Wheaton	Latinx
Tract 7021.01*	75.9	Silver Spring	Down-County/Silver Spring	Latinx, Black
Tract 7026.02	75.7	Silver Spring	Down-County/Silver Spring	Black
Tract 7016.01	75.2	Silver Spring	Down-County/Silver Spring	Black
Tract 7020*	74.7	Takoma Park, Silver Spring	Down-County/Silver Spring	Latinx
Tract 7031	70.9	Four Corners, Kemp Mill	Down-County/Silver Spring	Latinx
Tract 7014.25	70.7	Calverton	East County/White Oak	Black
Tract 7023.02	70.7	Silver Spring	Down-County/Silver Spring	Black
Tract 7025.02	70.4	Silver Spring	Down-County/Silver Spring	Black
Tract 7022	70.1	Silver Spring	Down-County/Silver Spring	White

C. RESJ Impact of Large-Scale Data Centers

To understand the RESJ impact of large-scale data centers, OLO reviewed the following research produced by RESJ advocates and organizers working with local BIPOC communities to address data center development:

- The People’s Report: A Gap Analysis of Data Center Infrastructure in Prince George’s County, Maryland.**³⁶ *The People’s Report* from the NAACP Center for Environmental and Climate Justice and the Center for Engagement, Environmental Justice, and Health was produced in response to the 2025 Qualified Data Centers Report from the [Prince George’s County Qualified Data Center Task Force](#). The report provides an independent environmental justice assessment of large-scale data centers in Prince George’s County based on academic research, perspectives from impacted community members, and policy analysis. It aims to serve as a guide for Prince George’s County and other local jurisdictions in Maryland to center environmental justice in data center development. The report was produced in collaboration with researchers, advocates, and organizers from multiple academic institutions and community groups, including the Howard University School of Law, South County Environmental Justice Coalition (SCEJC), and No Landover Data Center Coalition.

The [NAACP Center for Environmental and Climate Justice](#) advocates transforming or eliminating unjust systems and policies to build a cleaner and healthier environment and climate for communities of color. The Center supports community-driven work to ensure a right to a toxic free environment, energy democracy, ecological restoration that centers zero emissions, and community resilience.³⁷ The Center organizes the [Stop Dirty Data Centers](#) campaign, which is working with communities across the U.S. to combat the negative environmental justice impacts of large-scale data centers through policy, the courts, and advocacy.³⁸

The [Center for Engagement, Environmental Justice and Health \(CEEJH\)](#) is a national organization confronting environmental injustices and health inequities rooted in environmental racism, structural inequality, and neoliberal policies. They “INpower” underserved and overburdened communities through community science, collaborative problem-solving, and partnerships with grassroots organizations.³⁹

- The People Say No: Resisting Data Centers in the South.**⁴⁰ *The People Say No* report from MediaJustice provides a regional analysis of data centers in the South that centers impacts to Black and working-class communities.

³⁶ [“The People’s Report: A Gap Analysis of Data Center Infrastructure in Prince George’s County, Maryland,”](#) NAACP and CEEJH, 2026.

³⁷ *Ibid*, pg. 38.

³⁸ [“Advocacy in Action: Artificial Intelligence Data Centers in Our Communities,”](#) NAACP.

³⁹ *Ibid*, pg. 38.

⁴⁰ [“The People Say No: Resisting Data Centers in the South,”](#) MediaJustice, September 9, 2025.

[MediaJustice](#) started in 2001 as a Black-led media accountability coalition fighting racist media bias. Today, MediaJustice builds power to challenge how corporations and governments use media and technology to shape our collective future. MediaJustice’s work is rooted in community-centered solutions and racial, gender, and disability justice, among other values.⁴¹

MediaJustice is working with communities across the U.S. to address the negative environmental justice impacts of data center development. Locally, it is part of the No Landover Data Center Coalition.⁴²

Taken together, research compiled from these reports and other sources suggest the development of large-scale data centers can have impacts on the environment, utility costs, public health and community engagement that can disproportionately burden BIPOC community members while providing limited economic development benefits. The following sections describe these areas and proposed solutions to mitigate their negative RESJ impact.

1. RESJ Impact

OLO’s review of *The People’s Report* and *The People Say No* report identified eight areas of data center development that can impact RESJ:

- Water usage, quality and costs;
- Energy usage and costs;
- Land-use trade-offs;
- Climate burden;
- Air and noise pollution;*
- Public health burden;*
- Transparency and community engagement; and
- Economic development.

These areas are described below. Areas marked with an asterisk have been shown to have particularly acute impacts at the neighborhood level for community members living in the vicinity of data centers.

Water usage, quality, and costs. Both reports note data centers require massive amounts of water to cool their equipment. These cooling systems typically rely on potable water to avoid corrosion and bacteria growth.⁴³ *The People’s Report* notes a single large-scale data center can use as much as five million gallons of water per day. This is the equivalent use of a town of 10,000 to 50,000 people.⁴⁴ The vast majority of water used by data centers is lost through evaporation while the rest is discharged to

⁴¹ [“Who We Are,”](#) MediaJustice.

⁴² OLO communication with MediaJustice staff on July 7, 2026.

⁴³ [“The People’s Report,”](#) pg. 9; [“The People Say No,”](#) pg. 7.

⁴⁴ [“The People’s Report,”](#) pg. 10.

local wastewater facilities.⁴⁵ *The People's Report* explains water usage for data center operations can strain the local supply of drinking water, increase burdens on wastewater treatment, and heighten downstream impacts on water quality and local ecosystems.⁴⁶

Increased demand on water facilities from data center operations can drive up water rates for ratepayers. To the extent water rates increase, Black and Latinx community members in the County would be disproportionately burdened because they are overrepresented among households with lower incomes (Table 6-1).

Energy usage and costs. Both reports note data centers also require enormous amounts of energy to operate. For example, *The People Say No* report cites that “[o]ne data center campus with peak demand of one gigawatt is roughly equivalent to the average annual consumption of a city of around 1.8 million people.”⁴⁷

As noted in Chapter 3, increased demand for electricity from data center operations is driving up electricity rates for ratepayers. *The People's Report* notes that PJM, operator of the region's electric grid, has identified data center growth as a primary driver of recent price increases.⁴⁸ The report explains utilities often pass on a large share of costs from increased demand to residential ratepayers while maintaining preferential rates for commercial and industrial ratepayers.⁴⁹ Table 6-8 from the report shows how between 2010 and 2023, residential ratepayers in Maryland had electricity rate increases that were two to four times those of commercial and industrial ratepayers.

Table 6-8. Energy Rate Difference by Ratepayer Category in Maryland, 2010-2023 (cents/kWh)

Ratepayer Category	Average Electric Rate (2010)	Average Electric Rate (2023)	Percent Change in Rates
Residential	14.3	16.6	15.9%
Commercial	11.8	12.8	8.7%
Industrial	9.6	9.9	3.8%

Source: *The People's Report* citing Energy Equity Project (Figure 2, pg. 14). EIA form 861, Annual Sales (consumption), revenue, prices & customers, for total electric industry, averaged across all reporting utilities, 2010-2013.

Increasing electricity rates worsen household energy burdens.⁵⁰ *The People's Report* describes how households with low incomes face difficult tradeoffs to afford energy along with other basic needs like

⁴⁵ [“The People's Report,”](#) pg. 9; [“The People Say No,”](#) pg. 7.

⁴⁶ [“The People's Report,”](#) pg. 9.

⁴⁷ [“The People Say No,”](#) pg. 8 citing Spencer Kimball, [“Data centers powering artificial intelligence could use more electricity than entire cities,”](#) CNBC, November 23, 2024.

⁴⁸ [“The People's Report,”](#) pg. 13 citing [“Data Centers,”](#) Office of People's Counsel, Maryland State Government.

⁴⁹ *Ibid.*

⁵⁰ Energy burden is the percentage of household income that is spent on energy bills. A household's energy burden is considered high if it exceeds 6 percent of their income and severe if it exceeds 10 percent. Uche Ajene, [“Understanding Energy Burden: Why Some Communities Pay More,”](#) Initiative for Energy Justice, June 12, 2025.

food and medical care.⁵¹ As of 2022, County households with incomes below 30 percent of the area median income (AMI) had an energy burden of 11 percent, compared to between 1 and 4 percent for households with incomes above this threshold.⁵² If electricity rates increase, Black and Latinx community members in the County would be disproportionately burdened by increasing energy burdens because they are overrepresented among households with lower incomes (Table 6-1).

Chapter 1 describes recent changes to state law that aim to address increasing electricity costs for residential ratepayers driven by large load customers like data centers.

Land use trade-offs. Both reports also reference the massive amounts of land required by large-scale data centers. As noted by the Southern Environmental Law Center, “data center development can lead to sprawl, destruction of valuable habitat and farmland, damage to historic and scenic viewsheds, and loss of land that would be better used for housing, employment, and other local needs and opportunities.”⁵³

The People’s Report notes that data centers can be as large as 13 football fields, with their significant land use being difficult to justify for their minimal labor needs.⁵⁴ *The People Say No* report notes that in Bolingbroke, GA, residents have organized in opposition to the massive size of a proposed data center in their community, comparing it to that of 26 Walmart superstores.⁵⁵ Similarly, a recent report from 404 Media highlighted community push back against a 135,000 square foot data center in Taylor, TX, which is set to be built on land that was originally deeded by a Black family to build a public park for the community.⁵⁶

Climate burden. Both reports note data center development is increasing the demand for power sources that depend on fossil fuels. *The People Say No* report notes most of the electricity used to power data centers comes from fossil fuels.⁵⁷ Greenhouse gas (GHG) emissions from fossil fuels burden the environment and exacerbate climate change. (See Chapter 4, part A for the mix of fuel sources that provide Maryland’s electricity)

Large-scale data centers typically rely on backup diesel generators that burn fossil fuels.⁵⁸ Additionally, to meet the energy needs of data centers, some utilities are proposing to build new fossil gas power

⁵¹ “[The People’s Report](#),” pg. 13. See also, [Energy and AI](#), International Energy Agency, at p. 106 (2025).

⁵² [Low-income Energy Affordability Data \(LEAD\) Tool](#), U.S. Department of Energy.

⁵³ “[Getting It Right: Local Approaches to Data Center Development](#),” Southern Environmental Law Center, January 2026.

⁵⁴ “[The People’s Report](#),” pg. 23

⁵⁵ “[The People Say No](#),” pg. 54.

⁵⁶ Matthew Gault, “[A Farmer Donated Land to Turn into a Park. The City Is Building a Massive Data Center Instead](#),” 404 Media, June 8, 2026.

⁵⁷ “[The People Say No](#),” pg. 8 citing Miguel Yañez-Barnuevo, “[Data Center Energy Needs Could Upend Power Grids and Threaten the Climate](#),” Environmental and Energy Study Institute, April 15, 2025.

⁵⁸ Arcelia Martin, “[Data Centers’ Use of Diesel Generators for Backup Power Is Commonplace—and Problematic](#),” Inside Climate News, November 12, 2025.

plants or keep plants that were set to retire online.⁵⁹ *The People Say No* report explains in places like South Carolina, many of these plants are being built in predominantly Black communities.⁶⁰ In Maryland, the only coal fired plant in the state will likely continue operating for at least another five years after it was set to close in 2025.⁶¹ The plant is located in an Anne Arundel County neighborhood that has double the share of Black community members than the county's population.⁶²

Montgomery County's Climate Action Plan notes that extreme heat, severe storms, drought, and high winds are among the greatest climate threats to the County.⁶³ Because of structural racial inequities in various domains – including health care, employment, housing and transportation – Black and Latinx community members in the County are most susceptible to the worst effects of climate change.⁶⁴

Air and noise pollution.* *The People's Report* notes backup diesel generators that help power large-scale data centers discharge nitrogen oxides (that contribute to ground-level ozone pollution) and fine particulate matter that worsens air quality. This pollution is most severe in the immediate vicinity of data centers and can travel for hundreds of miles.⁶⁵

Further, almost ninety percent of respondents to the survey of Prince George's County residents for *The People's Report* strongly agreed they were concerned about noise pollution with data centers.⁶⁶ As noted by the Environmental and Energy Study Institute, "[d]ata centers emit sounds from the humming of cooling systems, rumbling of diesel generators, and whirring of fans, which can be heard for hundreds of feet around them."⁶⁷

As described next, air and noise pollution from large-scale data centers threaten the public health of community members. Data on EJ scores in Section B shows several Black and Latinx neighborhoods in the County experience high cumulative impact burdens that make them more susceptible to being overburdened by air and noise pollution if data centers are sited in those neighborhoods.

Public health burden.* Large-scale data centers can pose numerous overlapping threats to public health. Notably:

⁵⁹ ["The People's Report,"](#) pg. 13.

⁶⁰ ["The People Say No,"](#) pg. 60 citing Adam Mahoney, ["America's Digital Demand Threatens Black Communities with More Pollution,"](#) Capital B News, February 25, 2025.

⁶¹ Christine Condon, ["Maryland's last coal plant likely to get another extension,"](#) Maryland Matters, June 11, 2026.

⁶² ["Census Tract 7301.02, Anne Arundel, MD,"](#) Census Reporter.

⁶³ ["Montgomery County Climate Action Plan,"](#) Department of Environmental Protection, June 2021, pg. 47.

⁶⁴ Ibid, pgs. 19-20; Rachel Morello-Frosch, et al, ["The Climate Gap: Inequalities in How Climate Change Hurts Americans & How to Close the Gap,"](#) Dornsife Center, University of Southern California, May 2009

⁶⁵ ["The People's Report,"](#) pg. 11.

⁶⁶ ["The People's Report,"](#) pg. 24.

⁶⁷ Miguel Yañez-Barnuevo, ["Communities Are Raising Noise Pollution Concerns About Data Centers,"](#) Environmental and Energy Study Institute, March 23, 2026.

- Researchers caution that massive water consumption by data centers could worsen water insecurity in some communities and increase the risk of waterborne diseases, dehydration, and poor hygiene.⁶⁸
- Increasing energy burdens can lead to a range of health concerns. For example, *The People's Report* notes how community members who are unable to afford their energy costs may experience health issues from exposure to extreme heat or cold in their homes.⁶⁹
- Extreme weather events and systems disruptions exacerbated by climate change pose threats to physical and mental health that can cause illness, injury and death.⁷⁰ The American Public Health Association and multiple medical societies, including the National Medical Association – the collective voice of African American physicians – have declared climate change is a public health crisis that disproportionately harms BIPOC and other marginalized communities.⁷¹
- As described in *The People's Report*, exposure to air pollution from ground level ozone and fine particulate matter are associated with a range of serious health risks, from shortness of breath and asthma attacks, to cardiovascular disease and respiratory disease.⁷² A 2026 study found that under a high-growth scenario, data centers could contribute to approximately 600,000 asthma cases and 1,300 deaths across the U.S. in 2028.⁷³
- The American Public Health Association recognizes noise as a public health hazard and notes that noise is linked to auditory and non-auditory health problems, such as hearing loss, cardiovascular disease, and cerebrovascular disease.⁷⁴

Existing racial disparities in economic and health outcomes (described in Section B), suggest Black and Latinx community members are generally most susceptible to the public health impacts of worsening water quality, increasing energy burdens and exacerbating climate change. Depending on where they are located, air and noise pollution from data centers could worsen existing cumulative impacts burdens in Black and Latinx neighborhoods.

Transparency and community engagement. Both reports note many communities with data centers lack public reporting requirements in key areas, including water and electricity usage, energy sources,

⁶⁸ Yu Tao and Peng Gao, [“Global data center expansion and human health: A call for empirical research,”](#) Eco-Environment & Health, September 2025.

⁶⁹ [“The People's Report,”](#) pg. 13.

⁷⁰ [“Addressing the Public Health Crisis of Climate Change,”](#) American Medical Association, 2024, pgs. 6-11; Mona Sarfaty, et al., [“A Survey of African American Physicians on the Health Effects of Climate Change,”](#) International Journal of Environmental Research and Public Health, November 28, 2014.

⁷¹ [“Climate, Health, and Equity,”](#) American Public Health Association; [“Statement from the National Medical Association on the Good Neighbor Plan,”](#) National Medical Association, April 29, 2026; [“About Us,”](#) The Medical Society Consortium on Climate & Health.

⁷² [“The People's Report,”](#) pg. 11.

⁷³ Yuelin Han, et al., [“Health-Informed Computing: Estimating and Addressing the Public Health Impact of Data Centers,”](#) Computers and Society, June 8, 2026, pg. 2.

⁷⁴ [“Noise as a Public Health Hazard,”](#) American Public Health Association, October 25, 2021.

and GHG emissions.⁷⁵ As described later in the section, multiple states, including Maryland, also lack transparency in reporting on costs of tax exemptions for data centers.

The People Say No report notes in many communities, data center deals are being negotiated by local officials outside the public view in ways that undermine democracy and public input.⁷⁶ For example, an analysis by the Virginia Mercury found that in Virginia, home to the largest concentration of data centers in the world, 80 percent of localities with an existing, approved, or proposed data center have NDAs with data center companies. These agreements prevent local officials from disclosing a broad range of information about data center projects, including their direct impacts to communities.⁷⁷

In neighboring Prince George’s County, a survey of residents for *The People’s Report* found “respondents reported a lack of transparency, limited responsiveness to community preferences, and inadequate spaces for public input” across multiple measures. Notably:⁷⁸

- Eighty-six percent of respondents disagreed or strongly disagreed local officials and project leaders had been transparent about the impact of qualified data centers in the County;
- Seventy-six percent of respondents disagreed or strongly disagreed local officials and task force leaders seemed to care whether the community wanted qualified data centers in the County; and
- Sixty percent of respondents disagreed or strongly disagreed local officials and task force leaders had created a welcoming space for community members to share input regarding qualified data centers.

As described in Section A, lack of engagement with BIPOC communities in environmental decisions is a racial inequity that has historically characterized environmental racism.

Chapter 1 describes recent changes to state law that require large-load customers like data centers to report a variety of information to the Maryland Public Service Commission (PSC). Notably, public reports from PSC will be aggregated and anonymized. PSC will only provide information on specific large load customers by a Public Information Act request after a project is operational.

Economic development. Proponents of large-scale data centers often tout them for their potential to advance local economic development through job creation and tax revenue. However, both *The People’s Report* and *The People Say No* report refute the economic development benefits of data centers. As summarized in *The People’s Report*:

⁷⁵ [“The People’s Report,”](#) pg. 13; [“The People Say No,”](#) pg. 11.

⁷⁶ [“The People Say No,”](#) pgs. 1, 10-11.

⁷⁷ Eric Bonds and Viktor Newby, [“Data centers, non-disclosure agreements and democracy,”](#) Virginia Mercury, April 30, 2025.

⁷⁸ [“The People’s Report,”](#) pg. 23

[T]he touted economic benefits of data centers, whether in the form of promised tax revenue or new job creation, should be viewed skeptically. Any such potential economic benefit is likely to be far outweighed by the detrimental costs to local environments and surrounding communities.⁷⁹

Both reports note long-term employment benefits promoted from data center development are often inflated. *The People's Report* notes while data centers create many temporary jobs during the construction stage, their on-going operations result in minimal permanent jobs.⁸⁰ *The People Say No* report cites a 2025 analysis from Business Insider, which found “even the largest data centers generally employ fewer than 150 permanent workers, and some have as few as 25.”⁸¹ As noted earlier in the chapter, “Jobs cannot justify harm” is one of the principles of the Data Center Frontline Framework (Figure 6-1).

Additionally, both reports highlight substantial tax breaks that undermine tax revenues and community benefits from data centers. As described in *The People Say No* report:

Tax breaks can divert funds away from direct government expenditures in support of schools, tackling income inequality, investing in public transit, environmental remediation and other community needs...This affects marginalized communities the most, especially communities of color in the South.⁸²

A 2025 CNBC analysis cited in *The People Say No* report found 37 states have passed laws that grant sales tax exemptions for data centers. In total, across 16 states that publicly report on their exemptions, CNBC found \$6 billion in tax exemptions were awarded to data centers over a five-year period.⁸³ Further, a study by Good Jobs First referenced in *The People's Report* found in ten states that disclose at least some annual costs, subsidies to data centers via sales and use tax exemptions cost them between \$100 million and \$1 billion per year.⁸⁴ A 2025 study from researchers at the Ford School of Public Policy at the University of Michigan found tax incentives for data centers are generally ineffective, as they primarily benefit corporations at the expense of local communities.⁸⁵

⁷⁹ [“The People's Report,”](#) pg. 21.

⁸⁰ Ibid, pg. 19.

⁸¹ [“The People Say No,”](#) pg. 10 citing Hannah Becker, et al., [“Big Tech promised jobs. Cities gave millions. Where are the workers?”](#) Business Insider, June 20, 2025.

⁸² [“The People Say No,”](#) pg. 27.

⁸³ Paige Tortorelli, et al, [“In race to attract data centers, states can forfeit hundreds of millions of dollars in tax revenue to tech companies,”](#) CNBC, June 20, 2025.

⁸⁴ Kasia Tarczyska, [“Cloudy with a Loss of Spending Control: How Data Centers Are Endangering State Budgets,”](#) Good Jobs First, April 2025.

⁸⁵ Terry Nguyen and Ben Green, [“What Happens When Data Centers Come to Town?”](#) Gerald R. Ford School of Public Policy, University of Michigan, July 2025, pgs. 3, 7-9.

The People's Report notes in Maryland, there is a sales and use tax exemption for data center equipment.⁸⁶ However, adding to transparency concerns described earlier, Maryland is among twelve states that do not publicly disclose information on tax exemptions for data centers.⁸⁷

Summary. Taken together, this research suggests the development of large-scale data centers can have impacts on the environment, utility costs, public health and community engagement that can disproportionately burden BIPOC community members while providing limited economic development benefits.

As noted throughout this section, in the County, data center development could disproportionately burden Black and Latinx community members through:

- Potential increases to water rates;
- Increasing energy burdens through potential increases to electricity rates;
- Forgone land for other important community needs;
- The climate burden of increasing GHG emissions from fossil fuels;
- Public health burdens from worsening water quality, increasing energy burdens and exacerbating climate change; and
- Potential lack of transparency and community engagement in data center development process.

Black and Latinx community members could also be overburdened by air and noise pollution from data centers, especially if they are placed in communities that already face high burdens from cumulative impacts.

2. Promising Practices to Mitigate Negative RESJ Impacts

To mitigate the negative RESJ impacts of large-scale data centers, *The People's Report* and *The People Say No* report propose five promising practices for local jurisdictions. These practices are described below.

Halt data center development. Both reports recommend halting data center development to varying degrees.

The People Say No report recommends local communities organize to completely stop data center development.⁸⁸ MediaJustice has developed a companion toolkit to the report to assist local community members to organize against data centers.⁸⁹

⁸⁶ ["Data Center Maryland Sales and Use Tax Exemption Incentive Program,"](#) Maryland Department of Commerce.

⁸⁷ ["Cloudy with a Loss of Spending Control: How Data Centers Are Endangering State Budgets,"](#) Good Jobs First.

⁸⁸ ["The People Say No,"](#) pg. 2.

⁸⁹ ["Companion Toolkit – The People Say No: Resisting Data Centers,"](#) MediaJustice, September 17, 2025.

The March 2026 press release for *The People's Report* called on Prince George's County officials to extend the moratorium on data center approvals to consider and adopt the report's findings and recommendations.⁹⁰ Notably, 75 percent of survey respondents for the report indicated they did not want a large-scale data center in their community, regardless of mitigation efforts or benefits.⁹¹ Prince George's County approved a two-year moratorium on hyperscale data centers in July 2026.⁹²

Increase transparency in data center development. Both reports recommend that local decision-making processes for data center development be strengthened to improve transparency. This aligns with the 'Accountability must be enforceable' principle of the Data Center Frontline Framework (Figure 6-1).

The People Say No report generally recommends local communities call on their elected officials to negotiate data center development in public through accessible democratic processes that give community members a voice in decision-making.⁹³ The report specifically cautions against the use of recycled water and renewable energy certificates, noting they "can undermine transparency by obscuring actual water and energy use."⁹⁴

Based on its study of Prince George's County, *The People's Report* recommends public disclosure of energy use, water consumption, backup generator use, and facility-specific emissions to improve transparency in data center development. It recommends the county establish community-based partnerships to track data center performance and create a public dashboard to report metrics.⁹⁵

Increase community engagement in data center development. Both reports recommend that local decision-making processes for data center development be strengthened to improve community engagement. This aligns with the 'Communities most affected must lead' principle of the Data Center Frontline Framework (Figure 6-1). This also aligns with best practices to develop and implement policies and programs that advance RESJ.⁹⁶

The People's Report recommends that Prince George's County collaborate with community-based organizations to establish a Data Center Oversight Board to review data center applications, monitor compliance, and ensure approval decisions align with the county's climate and environmental justice goals. It recommends the board be comprised of county and community stakeholders that reflect and

⁹⁰ "NAACP, CEEJH INC Challenge PG County Data Center Task Force Findings in New Counter-Report," NAACP, March 12, 2026.

⁹¹ "The People's Report," pg. 25.

⁹² John Domen, "Prince George's County extends pause on hyperscale data centers," WTOP News via Maryland Matters, July 8, 2026.

⁹³ "The People Say No," pg. 2.

⁹⁴ Ibid.

⁹⁵ "The People's Report," pgs. 28, 29.

⁹⁶ Janmarie Peña and Chitra Kalyandurg, *OLO Report 2024-8: Community Engagement for Racial Equity and Social Justice*, Office of Legislative Oversight, March 12, 2024.

center lived experiences and perspectives of communities who will be most impacted by data center development.⁹⁷

Require environmental justice and cumulative impacts assessments for data center developments.

The People's Report recommends all proposed data center developments obtain special use exception⁹⁸ approval that includes environmental justice and cumulative impacts assessments as part of the development review process. The report recommends the assessments evaluate additive impacts such as air emissions, traffic, and flooding, and identify sensitive receptors such as homes and schools. It also recommends the assessments include an individualized, community-driven mitigation plan.

The People's Report further recommends that environmental justice mapping tools such as MDEnviroScreen be integrated into planning, zoning, and permitting “to identify and prevent the clustering of industrial data centers in overburdened or high-exposure communities.”⁹⁹

The People's Report points to the Maryland CHERISH Act (proposed in the 2026 Maryland General Assembly) as a model that can be adapted for local legislation to codify environmental justice and cumulative impact assessments and MDEnviroScreen into the review process for data centers and other hazardous facilities.¹⁰⁰

Of note, environmental justice and cumulative impacts assessments are consistent with Montgomery County's RESJ Act requirements to apply a RESJ lens to land use decisions, including developing RESJ impact statements for zoning text amendments and considering the RESJ impact of master plans.¹⁰¹

Condition data center development on renewable-energy sourcing, enforceable community benefits agreements, and fines for non-compliance. *The People's Report* recommends all data center permits and special use exceptions be conditioned on binding commitments to renewable-energy sourcing and enforceable CBAs.¹⁰² It also recommends a detailed and progressive fine structure for data centers not compliant with codes and standards that goes towards an environmental justice fund for climate mitigation.¹⁰³ These practices align with the ‘Accountability must be enforceable’ and ‘We reject false solutions and fossil fuel dependency’ principles of the Data Center Frontline Framework (Figure 6-1).

⁹⁷ Ibid, pg. 30.

⁹⁸ Prince George's County special use exception is equivalent to Montgomery County's conditional use. However, each County has its own requirements and processes.

⁹⁹ “[The People's Report](#),” pg. 30.

¹⁰⁰ Ibid, pg. 28; HB 1268, “[Environmental Permits - Requirements for Burden Analysis, Issuance and Renewal, and Public Participation \(Cumulative Harms for Environmental Restoration for Improving Shared Health - CHERISH Our Communities Act\)](#),” Maryland General Assembly; [CHERISH Act 2025 Fact Sheet](#), Clean Water Action.

¹⁰¹ [Bill 27-19](#), Montgomery County Council, effective March 2, 2020, pg. 14 (lines 297-298); [Bill 44-20](#), Montgomery County Council, effective March 12, 2021, pg. 3 (lines 41-48).

¹⁰² “[The People's Report](#),” pg. 28.

¹⁰³ Ibid, pg. 30.

For renewable-energy sourcing, the report notes the permit application for data centers should require a renewable energy-compliance plan, “including load projections, source type and location, timeline to full renewable operation, and annual third-party verification.” The report recommends permits be denied, conditioned, or revoked if sourcing commitments are not realized.¹⁰⁴ To prevent data centers from competing with consumers for existing renewable energy sources, researchers at the Ford School of Public Policy further recommend policies that require data centers to generate their own renewable energy capacity rather than relying on existing renewable infrastructure.¹⁰⁵

For CBAs, the National NAACP has developed a template and resources to support local communities negotiating CBAs for data center development.¹⁰⁶ As explained by the Sabin Center for Climate Change Law at the Columbia Law School, CBAs are:

[L]egally binding contracts between project developers and host municipalities and/or local community groups, under which the developer agrees to provide specified benefits to the community in which it wishes to operate, and, in return, the community agrees to not oppose or to support the project.¹⁰⁷

The Sabin Center notes there are not many existing examples of CBAs for data centers, as the practice is still emerging. Nonetheless, they explain existing CBAs for other projects, best practices from research, and existing resources, like those from their center and the NAACP, are important tools for local communities to develop CBAs for data centers.¹⁰⁸

Based on the NAACP’s resources, key commitments to consider for data center CBAs include jobs and training requirements, environment and climate disclosures, equity impact assessments, and tenant protections, among other community benefits.¹⁰⁹ Chapters 4 and 7 discuss data center related CBA efforts in other local jurisdictions. A summary of CBAs negotiated for data center projects in Lancaster, PA and St. Louis, MO are included in Appendix G and H.

¹⁰⁴ Ibid, pg. 28.

¹⁰⁵ Terry Nguyen and Ben Green, [“What Happens When Data Centers Come to Town?”](#) pg. 15.

¹⁰⁶ [“A Data Center is Moving in: Now What?”](#), [“Community Benefits Agreement Template,”](#) and, [“Cost Recovery Support Agreement Template,”](#) Stop Dirty Data, NAACP

¹⁰⁷ Vincent Nolette, [“Community Benefits Agreements and Data Center Development,”](#) Sabin Center for Climate Change Law, Columbia Law School, May 28, 2026.

¹⁰⁸ Ibid.

¹⁰⁹ [“Community Benefits Agreement Template,”](#) Stop Dirty Data, NAACP

Chapter 7. Regulating Data Centers at the Local Level

This report has thus far summarized publicly available information and research about observed and potential impacts on local economies, energy demand, environment, quality of life, and racial equity and social justice in jurisdictions that have authorized the building of data centers.

Across the country, local jurisdictions are developing tailored approaches to address where data centers should be allowed, how development review should occur, how use standards should be defined, how energy and infrastructure expectations should be addressed, and how community benefits should be included.¹ This chapter reviews the laws, regulations, and zoning requirements in jurisdictions where data centers have been built and identifies best practices for regulating their approval, construction, and operation.

- **Section A** describes jurisdictions' approaches to regulating data centers based on location, size, or design;
- **Section B** summarizes jurisdictions' approaches to regulating data center water and energy use;
- **Section C** reviews considerations and laws in jurisdictions that regulate the decommissioning of data centers at the end of their useful life;
- **Section D** identifies several ways that jurisdictions have addressed public notice requirements and reporting of information related to data center projects;
- **Section E** provides examples of community benefit agreements that have been negotiated between a locality and a data center developer; and
- **Section F** documents and compares several jurisdictions' zoning and use standard requirements pertaining to data centers.

¹ Metropolitan Washington Council of Governments, [Land Use and Economics Primer](#), May 2026.

The following table provides an overview of the regulatory strategies localities have used to help plan for and mitigate the impacts of data center development.

Table 7-1. Local Regulatory Strategies for Data Centers

Location, Planning, Public Notice	Size and Design	Environmental
• Conditional use or special exception • Overlay zones • Regulations based on size • Regulations based on principal or accessory uses • Public notice • Community engagement • Transparency requirements (e.g., monthly reports on water and electricity usage, prohibit nondisclosure agreements) • Community benefits agreements	• Screening, fencing, and landscape buffers • Minimum setbacks • Maximum height • Visual and design aesthetics to resemble office buildings (variation in building height and mass, windows, differentiated surfaces) • Lighting standards • Noise studies • Maximum decibel levels	• Power Usage Effectiveness targets • Mandated renewable energy • Heat recovery systems • Generator emissions standards or diesel prohibitions • Water feasibility study • Gray water recycling • Potable water limits or fees • Closed-loop cooling • Pollutant limits for cooling towers • Mitigate wetland, watershed, and fragile ecosystem impacts • Decommissioning requirements

Four key findings emerge from the information reviewed in this chapter:

- Local governments have taken a variety of approaches to regulate the development of data centers. Some jurisdictions limit where data centers can be located in a specific area, some limit data centers based on size, and some regulate data centers based on their purpose and design.
- Jurisdictions in the Washington metropolitan area use a variety of methods to review and approve data center applications. Some offer a mix of by-right and special exception, some offer only conditional or special approvals, and some use overlay districts to govern where and how data centers can be built.
- Regulations related to data center energy and water usage, efficiency, and infrastructure are being pursued and implemented at state and local levels. Examples include energy efficiency standards, water recycling or closed-loop requirements, and decommissioning plans.
- Local governments are exploring various mechanisms to mandate public hearings on data center development and reporting on energy and water use. Community benefits agreements tied to data center development offer a promising approach for localities to protect adjacent neighborhoods, establish environmental standards, and provide community benefits.

A. Approaches to Regulating Data Centers

1. Conditional Use or Special Exception

Based on a review of local ordinances, the typical way jurisdictions in the Washington metropolitan area permit data centers is through a conditional use or special exception approval process. Both processes require public hearings where residents can participate and provide input.

At the time of writing, data centers in Montgomery County are considered a communications facility, which is allowed by conditional use in all zones. The conditional use process requires an application to the Planning Department, a careful review of potential impacts from building on the site, a period of public notice and input, and a hearing by the Office of Zoning and Administrative Hearings (OZAH), which approves or denies the conditional use application.²

In Loudoun County, Virginia, data centers must follow the special exception process. Each data center development application is subject to a public hearing and examination from the public, county staff, and Planning Commission, before it may receive special exemption approval from the County Board of Supervisors.³ In Loudoun County, data centers may only be permitted by special exception approval in the Industrial Park, General Industry, and Mineral Resources-Heavy Industry zoning districts.⁴ In Fairfax County and Prince William County, Virginia, data centers are permitted by-right⁵ in certain office and industrial zones but require special use exemptions in other districts.

2. Establishment of Data Center Overlay Zones

Some jurisdictions have created overlay zones to regulate the placement of data centers. An overlay zone is an additional layer of regulation placed on top of existing zoning regulations to modify rules. It often modifies or supplements the underlying rules (e.g., building height, permitted land use, design standards) to address specific geographic, environmental, or community goals.⁶ The information below describes overlay zones related to data centers in two local jurisdictions.

In January 2026, Frederick County, Maryland established the Critical Digital Infrastructure Overlay Zone (CDI-OZ) to manage where large-scale digital infrastructure—such as data centers and related electric substations—may be developed. County officials reported that the overlay zone creates predictability for the community and data center industry as to where data centers can be located and limits

² Montgomery Planning, [Conditional Use Applications](#).

³ Holland & Knight, [Loudoun County, Virginia, Eliminates By-Right Data Center Development](#), April 4, 2025.

⁴ Loudoun County, [Phase 1: Project Plan for Data Center Standards & Locations](#).

⁵ “By-right development is construction or land use that is already permitted under the existing zoning, without the need for any discretionary approval. If a project complies with the zoning code's allowed uses and standards — setbacks, height, density, parking — the owner is entitled to build it, subject only to ordinary permitting and inspections.”

Source: Barnes Walker, [By Right Development](#).

⁶ Center for Land Use Education, [Planning Implementation Tools Overlay Zoning](#), November 2005.

potential conflicts with residential, rural, and institutional uses elsewhere.⁷ The law states the purpose and intent of the zone:

The Critical Digital Infrastructure Overlay Zone is created for the purpose of directing Critical Digital Infrastructure Facilities and Electric Substations to industrial lands in proximity to data conveyance infrastructure and other industrial uses, while minimizing impacts to non-compatible uses and allowing for development of industrial lands not included in the Overlay Zone for other industrial uses.⁸

A key feature of the CDI-OZ is its small scale. By law, the overlay zone may cover no more than one percent of Frederick County's total land area. The overlay zone as established includes 2,614 acres, covering 0.61 percent of the county.⁹

In 2016, Prince William County, Virginia created the Data Center Opportunity Zone Overlay District (DCOZOD) to promote "the development of data centers within areas of the County where there is existing infrastructure that could adequately support the proposed use."¹⁰ The intent of the overlay district is to continue county efforts to attract and advance high-tech industrial development while limiting negative impacts to surrounding communities.¹¹ The figure below depicts the current Data Center Opportunity Zone Overlay Districts in Prince William County, shown in solid blue.

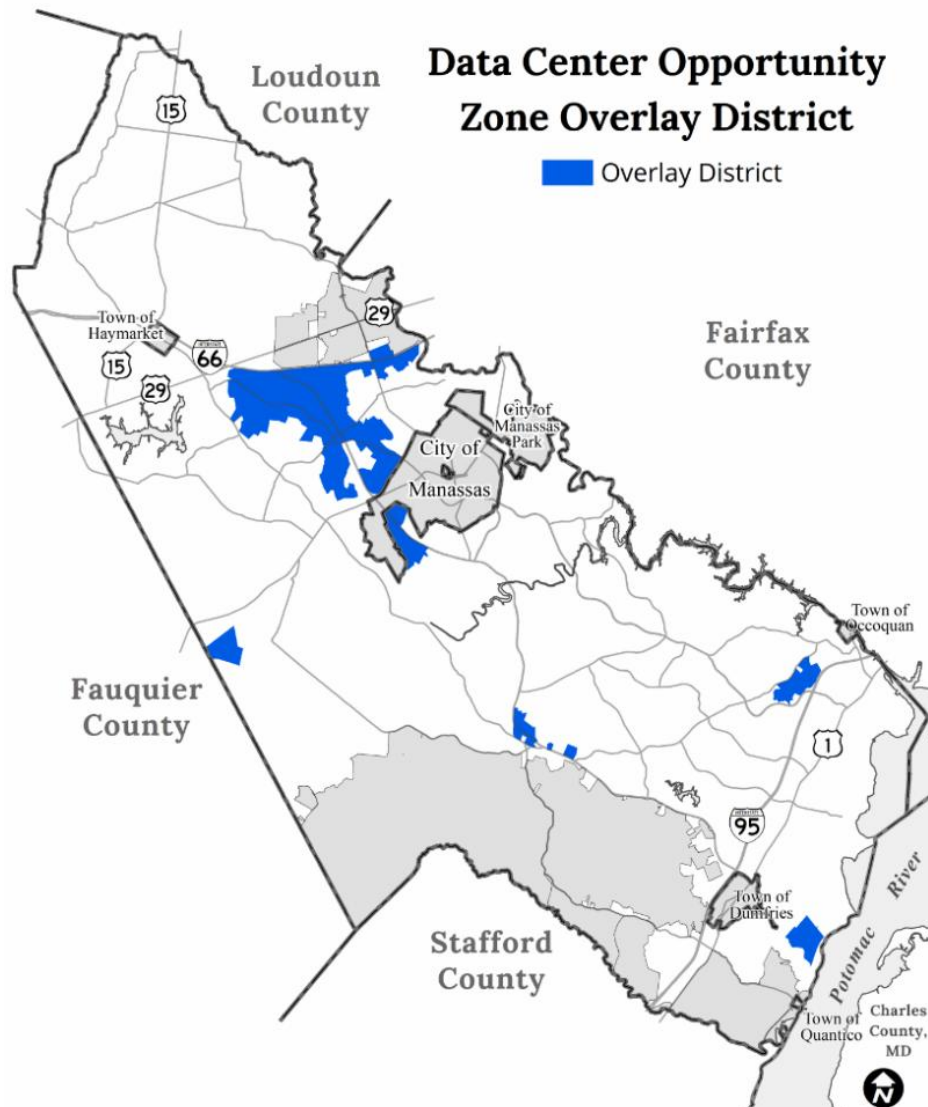
⁷Frederick County, [Critical Digital Infrastructure Overlay Zoning Text Amendment](#), May 27, 2025; [Understanding Frederick County's Critical Digital Infrastructure Overlay Zone \(CDI-OZ\)](#), MacRo LTD, February 11, 2026.

⁸ Frederick County Zoning Ordinance, [§ 1-19-10.1100. CRITICAL DIGITAL INFRASTRUCTURE OVERLAY ZONE \(CDI-OZ\)](#).

⁹ Frederick County, [Ordinance 26-01-001](#), adopted January 20, 2026.

¹⁰ Prince William County Zoning Code, [Part 509. - Data Center Opportunity Zone Overlay District](#).

¹¹ Prince William County Planning Office, [DPA2021-00020: Data Center Opportunity Zone Overlay District Comprehensive Review](#).



Source: [Prince William County Planning Office](#).

As of July 2026, Prince William County is in the process of updating the overlay district and determining where data centers should be allowed by right, allowed via a special use permit, or prohibited altogether.¹²

3. Regulations Based on the Size of Data Centers

Several jurisdictions require data centers of a certain size to go through a more stringent development process compared to smaller data centers.

The City of Tucson, AZ is proposing to define a “large-scale data center” as any data facility with a gross floor area greater than 25,000 square feet or uses greater than 20 megawatts (MW) of energy. For

¹² Prince William County, [Res. No. 26-374](#), June 9, 2026.

context, 20 megawatts can power about 16,500 average U.S. homes in a given moment.¹³ Large-scale data centers would only be allowed through a rezoning or major amendment to a Planned Area Development or Planned Community Development, which are subject to Mayor and Council review. Large-scale data centers would also be subject to water, noise, generator, and setback requirements.¹⁴

An ordinance covering unincorporated Linn County, Iowa defines large-scale data centers as facilities that have an electrical capacity greater than 20 MW or that use more than 50 gallons per minute of water on an annualized basis. Small-scale data centers are facilities that fall under these energy or water use thresholds. Large facilities are only permitted in the large-scale data center district, which requires a major site plan approval, water study and use agreements, and economic development agreement, among other stipulations. Small-scale data centers are allowed through the standard conditional use permit process in agricultural, general commercial, or industrial districts.¹⁵

Albemarle County, VA allows data centers of up to 40,000 square feet in areas with industrial zoning. Any data center over 40,000 square feet requires a special use permit, which is a discretionary review process by the Planning Commission and Board of Supervisors.¹⁶

Similarly, Fairfax County allows data centers in some commercial and industrial districts. Office and High-Intensity Office districts allow data centers by-right up to 40,000 square feet of gross floor area. Low-, Light- and Medium-Intensity Industrial districts allow data centers by-right up to 80,000 square feet of gross floor area. There is no size limit in General and Heavy Industrial districts. Any size limit may be exceeded through the special exception approval process.¹⁷

4. Regulations Based on Principal or Accessory Use

Localities can have different standards for data centers as accessory or principal uses. Accessory use data centers are typically constructed to serve the IT uses on the property. Principal use data centers provide data processing and storage to users offsite. Principal use data centers are typically much larger in scale, energy impact, and infrastructure needs than accessory use data centers. An analysis conducted by the Henrico County, VA Planning Department argued that small, internal data centers should continue to be permitted by-right in Office, Business, and Industrial Districts because these accessory data centers have demonstrated their ability to coexist with a variety of neighboring uses. The Planning Department recommended that hyperscale data centers, which can take up hundreds of thousands of square feet, should be treated differently and undergo strict scrutiny in the approval process.¹⁸

¹³ S. Toro, [20 MW data center consumes enough electricity to power approximately 16,500 average U.S. homes](#), Aterio.

¹⁴ City of Tucson Planning & Development Services, [Regulations For Large-Scale Data Centers - Fact Sheet](#), May 28, 2026.

¹⁵ Linn County Iowa, [Data Center Ordinance](#).

¹⁶ Albemarle County Community Development Department, [Data Center Regulations](#).

¹⁷ Fairfax County Zoning Ordinance, [Adoption of an Amendment to Chapters 112.1 and 112.2](#), September 10, 2024.

¹⁸ Henrico County Planning Department, [Data Center Regulation Staff Analysis](#), May 1, 2025.

B. Regulations on Resource Usage

State and local officials are developing laws and regulations related to data center energy and water usage, efficiency, and infrastructure. The PJM Interconnection grid serves 13 states and D.C., including Maryland and Virginia.¹⁹ PJM is “in the process of determining how to allocate the cost [amongst ratepayers] created by the need to procure gigawatts of new energy generation for data centers.”²⁰ Maryland’s [Utility RELIEF Act](#) requires that utilities pass along to data centers any costs created by data centers’ increasing use of energy. The Utility RELIEF Act also directs the Public Service Commission to create a voluntary large-load interruptible interconnection service that would allow large load customers like data centers “to connect to the grid faster if they agree to not pull [electricity] from the grid during peak demand hours.”²¹ See Chapter 3 for more information on the impacts of data centers on utility rates for residents.

1. Energy Sources and Usage Requirements

Unlike most commercial or industrial uses, data centers require uninterrupted power for servers and cooling systems to operate continuously. Due to high energy demands and associated grid impacts, the Chester County and Montgomery County, PA Data Center Ordinance Guide states policymakers should encourage new data centers to be “designed and operated to meet the highest achievable standards of energy efficiency.”²² The [U.S. Green Building Council’s LEED BD+C: Data Centers](#) rating system provides a set of best practices tailored to the unique energy demands of data center facilities. Municipalities may incentivize or require compliance with these LEED standards as part of the conditional use process to “help reduce overall electricity consumption, improve operational performance, and lessen strain on local grid infrastructure.”²³

Power Usage Effectiveness (PUE) describes the ratio of the total amount of energy consumed by the entire facility to the energy delivered solely to the IT computing equipment. A Virginia state bill that failed in 2025 would have granted sales and use tax exemptions for data center purchase only if a data center operator demonstrated that its facilities have a PUE score of 1.2 or less (the closer the ratio is to 1.0, the more efficient the facility is).²⁴ In 2023, the German Parliament passed the Energy Efficiency Act that mandated PUE standards based on the year a data center began operation. Data centers that begin operations on or after July 1, 2026, must achieve a PUE of less than or equal to 1.2. In addition, from 2027 onward, data center operators in Germany will be required to cover 100 percent of their electricity consumption from renewable sources.²⁵

¹⁹ [PJM | Federal Energy Regulatory Commission](#).

²⁰ J. Demarco, [Every Single Thing in the Utility RELIEF Act](#), Maryland Energy Talk, April 14, 2026.

²¹ J. Demarco, [Every Single Thing in the Utility RELIEF Act](#), Maryland Energy Talk, April 14, 2026.

²² Chester County and Montgomery County (PA) Planning Commissions, [Data Center Ordinance Guide](#), at p. 10 (April 2026).

²³ Chester County and Montgomery County (PA) Planning Commissions, [Data Center Ordinance Guide](#), April 2026.

²⁴ Virginia State Legislative Information System, [Senate Bill No. 1196](#), Offered January 8, 2025.

²⁵ White&Case, [Data center requirements under the new German Energy Efficiency Act](#), October 25, 2023.

Localities in the United States could include such requirements in their developer agreements or zoning codes. For example, the City of St. Louis established conditional use permit provisions with the developers of the Armory Innovation Data Center that required the facility to maintain a PUE of 1.25 or better (1.35 if repurposing an existing building), pursue a LEED or other green building certification, fund its own project-specific electrical infrastructure, and achieve at least 50 percent of the energy load from renewable sources within five years, among other provisions.²⁶

The Georgetown Climate Center highlights four best practices to include in local ordinances regulating data center energy use:²⁷

1. **“Reduce the need for new electric generation** by incorporating best available energy efficiency into the design of data center servers, cooling units, and building envelope;
2. **Cover a minimum percentage of all roof space (e.g., 75 percent) with solar arrays** to offset some of the new demand on the electric grid and reduce onsite emissions;
3. **Utilize battery storage as a backup energy source** for a minimum percentage (e.g. 50 percent) of total onsite back-up energy needs to reduce or eliminate the pollution associated with diesel backup generators; and
4. **Monitor and report on energy efficiency** and emissions data on a periodic basis (e.g. quarterly).”

Section D.1 of this chapter describes the State of Maryland’s new requirements for large load users to report on energy source and usage.

2. Water Use

Data centers can use large amounts of water to cool critical infrastructure. A few cities in Arizona have adopted ordinances regulating data center water use. The City of Chandler, AZ limits water use for data centers to 115 gallons per day per thousand square feet of space. The Town of Marana, AZ prohibits its water department from supplying data centers with potable water.²⁸ The City of Tucson, AZ requires large quantity customers that use 7.5 million gallons of water per month to recycle at least 30 percent of their water and prove the water has not been wasted.²⁹

Susquehanna County, PA requires that all new data centers and qualifying expansions use closed-loop cooling for server racks and IT equipment.³⁰ In Virginia, the Department of Environmental Quality will conduct a study on how to retrofit existing data centers in the groundwater management area to use air cooling, 100 percent recycled water, or switch to a closed-loop system instead of using evaporative

²⁶ City of St. Louis, [Armory Innovation Data Center Project: Summary of Conditional Use Provisions](#), April 21, 2026.

²⁷ Georgetown Climate Center, [Local Ordinances to Help Bring Data Centers into Alignment with Climate Goals](#), October 2025.

²⁸ B. Walton, [Data Centers a Small, But Growing Factor in Arizona’s Water Budget](#), Circle of Blue, April 2, 2025.

²⁹ K. Mendoza, [Tucson passes ordinance regulating large water users after data center debate](#), AZPM, August 21, 2025.

³⁰ Susquehanna County, [ORDINANCE NO.2025-01](#), December 29, 2025.

cooling.³¹ Reference the water consumption Table 4-1 in chapter four on environmental impacts for more information on the difference between open-loop and closed-loop cooling.

C. Regulations on Decommissioning Data Centers

Given the rapid expansion of data centers and continuous evolution of the technology industry, planners have noted concerns that: 1) data centers could become functionally obsolete in the future, or 2) data processing technology could advance to occur in smaller spaces, limiting demand for large-scale data centers. Even during the current moment of rapid data center build-out, “the market could become saturated, and projects could be abandoned prior to completion.”³²

The prospect of data center vacancies poses numerous challenges. Data centers are constructed in a manner that is not easily adaptable. Other industries may struggle to reuse data center facilities that may not have sufficient bathrooms, bay doors, loading docks, or flexible interior layouts.³³ Data centers may also be sited in locations not suitable for heavy truck traffic that another industrial use might require.³⁴ Finally, the significant amounts of hazardous materials that data centers use, including batteries, fuel, and refrigerants, may be difficult to dispose.

For these reasons, localities can require data center applications include decommissioning plans that describe how the data center would be restored or adapted, both logistically and financially, at the end of its useful life. A report by the Chester County, PA and Montgomery County, PA Planning Commissions suggest several best practices for decommissioning plans:³⁵

- a. All above-ground structures, equipment, and accessory facilities shall be removed.
- b. Hazardous materials, including batteries, fuel, or refrigerants, shall be disposed of in compliance with state and federal law.
- c. Disturbed soils shall be stabilized and re-vegetated.
- d. Any utility connections shall be safely disconnected and capped.
- e. The site shall be restored to a condition compatible with surrounding land uses or consistent with the most restrictive adjacent zoning district.

Susquehanna County, PA requires the data center owner and operator, at its expense, to complete decommissioning of the facility within twelve months after the end of its useful life. Decommissioning

³¹ S. Heckt, [Virginia has a new two-year budget. Here’s what lawmakers now require of data centers.](#), News From the States, June 30, 2026.

³² Chester County and Montgomery County (PA) Planning Commissions, [Data Center Ordinance Guide](#), April 2026, page 23.

³³ Springfield Township Planning Commission Memorandum, [Zoning for Data Centers](#), December 8, 2025.

³⁴ Chester County and Montgomery County (PA) Planning Commissions, [Data Center Ordinance Guide](#), April 2026.

³⁵ Chester County and Montgomery County (PA) Planning Commissions, [Data Center Ordinance Guide](#), April 2026.

includes removal of all hazardous materials and contents, cabling, electrical components, and any other associated facilities.³⁶

Local policymakers and planners should consider what tools can reduce the risk that vacated data centers result in unusable land. The Brookings Institution suggests policies such as phased approvals, decommissioning bonds, escrow accounts, adaptive reuse plans, and performance milestones.³⁷

D. Regulating Information Related to Data Centers

1. Public Reporting

As noted in Chapter 6 on environmental justice impacts, many data center projects lack public reporting requirements in key areas, including water and electricity usage, energy sources, and greenhouse gas emissions.

At the state level, the Maryland General Assembly passed [the Utility RELIEF Act](#), which contains a number of provisions that apply to data centers. Large load users, which include data centers with a monthly maximum demand of 25 megawatts or more, must register with the Public Service Commission (PSC). Large load data centers in Maryland must report information about monthly water usage and source, annual energy usage and source, onsite backup generation, and any other information the PSC deems necessary. The PSC will aggregate and anonymize the data collected before sharing the information publicly. The usage data for individual projects can be attained through a Maryland Public Information Act request after a project becomes operational.³⁸

At the local level, Linn County, IA's [data center ordinance](#) requires large-scale data centers (defined above) to complete a water study prior to approval and sign a water use agreement with the county. The agreement mandates the data center operator to track and report water use, share information about compliance with permits, and take steps to reduce water use during droughts or emergencies to protect public health, safety, and existing water users.³⁹

2. Nondisclosure Agreements

Nondisclosure agreements (NDAs) are contracts between a data center developer and a local government that prohibit sharing information about development deals, which severely limits the public's ability to make informed decisions and provide feedback on data center developments.⁴⁰ An analysis by the Virginia Mercury found that in Virginia, 25 of the 31 localities with an existing, approved,

³⁶ Susquehanna County, [ORDINANCE NO.2025-01](#), December 29, 2025.

³⁷ A. F. Pipa & A. Aley, [The local implications of data centers for rural communities in the US](#), Brookings, January 27, 2026.

³⁸ J. Demarco, [Every Single Thing in the Utility RELIEF Act](#), Maryland Energy Talk, April 14, 2026.

³⁹ Linn County Iowa, [Data Centers in Unincorporated Linn County](#), March 4, 2026.

⁴⁰ North Star Data Center Policy Toolkit, [Local](#).

or proposed data center have NDAs with data center companies.⁴¹ While NDAs commonly restrict sharing information about a company's proprietary technology, the investigation found these NDAs were written broadly to prohibit localities from sharing business plans and non-public information that could include information relating to the number of buildings planned, water usage, sewage usage, and other community impacts. These agreements also gave data center companies advanced notice to intervene with its legal team before any information requested by the public is shared.⁴²

A bill was introduced in the 2026 Maryland General Assembly that would have prohibited certain individuals from entering into an NDA with a person involved in an economic development activity, including establishing or operating a data center.⁴³ Other legislation introduced in Minnesota would have prohibited municipalities from entering NDAs for any project that uses public funding.⁴⁴ While neither of these measures were adopted, many stakeholders recommend that jurisdictions do not enter into NDAs with data center developers as a way to limit information available to the public.⁴⁵

3. Public Notice and Community Hearings

Localities could require a minimum number of public community hearings as part of the approval process, with educational information provided well in advance of any hearing. Planners and developers could be required to engage in proactive outreach to community leaders, community groups, and residents of areas adjacent to the proposed site and to those impacted more broadly by rate increases, pollution, or resource use.⁴⁶ For example, the City of Tucson, AZ is proposing to expand notification requirements to all property owners within a half mile of a planned site and to all neighborhood associations within two miles of the site. Large-scale data centers would also be subject to a neighborhood meeting and a city council decision.⁴⁷

Some localities do have public notice requirements and running afoul of them can impact development of a data center. For example, in 2022, Prince William County, VA approved a Digital Gateway planning proposal to open more than 1,000 acres of rural land to data center development. This area shares a border with two federal and state parks, Manassas Battlefield National Park and Conway-Robinson Memorial State Forest.⁴⁸ A local homeowners' association sued the county for failing to comply with

⁴¹ E. Bonds and V. Newby, ["Data centers, non-disclosure agreements and democracy,"](#) Virginia Mercury, April 30, 2025.

⁴² Ibid.

⁴³ Maryland General Assembly, [SB 0853](#), introduced February 6, 2026.

⁴⁴ Minnesota Legislature, [HF 4077](#), introduced March 9, 2026.

⁴⁵ See, e.g., E. Bonds & V. Newby, [Data Centers, Non-Disclosure Agreements and Democracy](#), Virginia Mercury, April 30, 2025. M. Turner, [Loudoun County, Virginia: Data Center Capital of the World "A Strategy for a Changing Paradigm."](#) June 1, 2026.

⁴⁶ North Star Data Center Policy Toolkit, [Transparency](#).

⁴⁷ City of Tucson Planning & Development Services, [Regulations For Large-Scale Data Centers - Fact Sheet](#), May 28, 2026.

⁴⁸ M. Barthel, [Prince William County Supervisors Approve Plan To Allow Data Centers Near Manassas Battlefield](#), DCist.com, November 3, 2022.

state and local notice requirements. In August 2025, a judge halted the Digital Gateway plan because the county had not made the development plans, ordinances, or amendments available to the public.⁴⁹

E. Enforceable Community Benefits Agreements

Localities can negotiate Community Benefits Agreements (CBAs) with data center developers to condition approval on legally enforceable provisions that protect adjacent neighborhoods, establish environmental standards, and provide meaningful community benefits. At the state level, the Nebraska legislature passed a law in 2026 that directs the owner or operator of a data center to “enter into a community benefit agreement with communities affected by the data center.”⁵⁰

In 2025, the City of Lancaster, PA approved a CBA that requires the owner of two data centers built in the municipality to:

- Contribute \$10 million to the City’s Economic Development Fund and \$10 million to the Sustainable Development and Clean Energy Fund;
- Commit to local hiring efforts for construction and permanent jobs;
- Adhere to noise, air, renewable energy, and water use standards; and
- Maintain a public website with project updates, timelines, permits, and a portal for questions or complaints.⁵¹

Appendix G of this report contains a summary of the CBA between the City of Lancaster and the owners of the Lancaster AI Hub.

Also in 2026, a municipal agreement between the City of St. Louis, MO and the developers of a 120-megawatt data center includes a significant number of required use conditions and CBA provisions, including noise, energy efficiency, water use, tax revenue, job requirements, and other investments into the community. According to the press release, the City of St. Louis “will be able to seek legal recourse, including financial compensation, if specific provisions of the community benefits agreement are not met” throughout the life of the project.⁵² Notable provisions of the CBA and conditional use approval require the developer to:

- Contribute \$30 per square foot of approved data center development, for an estimated \$15 million to a City fund for use on multi-modal transportation enhancements and economic and environmental justice activities;
- Not seek local tax abatement incentives for the data center or Armory building;

⁴⁹ C. Muzyk & J. Palermo, [BREAKING: Judge overturns Prince William Digital Gateway](#), Prince William Times, August 7, 2025.

⁵⁰ Nebraska Legislature, [Legislative Bill 1010](#), Approved by the Governor April 14, 2026.

⁵¹ City of Lancaster, [Data Center Community Benefits Agreement](#).

⁵² City of St. Louis, [City of St. Louis Approves Permit for Data Center Project, Announces Significant Conditions and Community Benefit Framework](#), April 21, 2026.

- Meet escalating job creation minimums for 20 years (starting at 25 jobs in year 1, 50 in year 2, and 100 thereafter);
- Comply with the City's hiring ordinance to prioritize City residents for entry-level jobs;
- Use a closed-loop system and air-cooled chillers to minimize water consumption;
- Ensure that at least 50% of the data center's energy load comes from renewable sources within five years of commencing operations;
- Maintain a Power Usage Effectiveness (PUE) of 1.25 or better, or 1.35 or better if more than 50% of the existing building on the parcel is repurposed; and
- Safely remove and recycle electronic waste if the data center is vacant for over a year.⁵³

Appendix H of this report contains a complete summary of the CBA provisions and conditional use provisions between the City of St. Louis and the developers of the Armory Innovation Data Center.

F. Data Center Zoning Requirements and Use Standards in the Region and Beyond

The table below provides a summary of select comparable jurisdictions in the Washington metropolitan region and beyond that have adopted or are considering zoning and other use standard requirements pertaining to data centers. OLO did not include regulations related to data centers larger than a million square feet like those built and proposed in Nevada, Texas, and Utah. The Appendix of this report includes verbatim data center zoning regulations from the following jurisdictions:

- Frederick County, MD
- Prince George's County, MD
- Fairfax County, VA
- Loudoun County, VA
- Prince William County, VA
- Susquehanna County, PA
- Linn County, IA

⁵³ City of St. Louis, [City of St. Louis Approves Permit for Data Center Project, Announces Significant Conditions and Community Benefit Framework](#), April 21, 2026.

Table 7-2. Data Center Zoning Requirements and Use Standards in Metro Washington and Other Notable Jurisdictions

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Montgomery County, MD (Existing) ⁵⁴	Allowed by conditional use in all zones.	• Tower/building set back one foot for every foot of height of tower/building from all property lines. • Screening is not required. • Offices prohibited in residential zones.	None
Montgomery County, MD (Proposed in ZTA 26-01) ⁵⁵	Allowed by conditional use in industrial zones if the project meets all requirements.	• An additional 500-foot setback for data center structures that share a boundary with residentially zoned property. • Minimize the visual impact to surrounding sites. • Minimize or avoid impacts to neighboring properties with non-industrial uses. • Vegetative screening must be between security fence and the public view. Chain link or similar woven metal or plastic fencing not allowed. • Noise analysis that assesses impact of all noise sources and determines appropriate layout, design, and measures to ensure ongoing operations minimize noise in conformance with County’s Noise Ordinance. • Demonstrate the siting of the proposed use will not have a negative impact that disproportionately affects overburdened communities or underserved communities as defined in Md. Code Ann., Environmental Article, § 1-701.	• Minimize negative impacts to wetlands, streams, and environmentally sensitive areas as much as possible. • Side and rear yards must include landscaped buffer, including four-season visual screen. • Lighting must include elements that reduce negative impacts to wildlife migration, nocturnal habits, and circadian rhythms. • Generators must meet or exceed Tier 4 or equivalent emission standards as defined by the United States Environmental Protection Agency.

⁵⁴ Montgomery County Zoning Code, [Article 59-3. Uses and Use Standards, Section 3.5.2 Communication Facility](#).

⁵⁵ [Introduction Staff Report for Zoning Text Amendment \(ZTA\) 26-01, Commercial Uses – Data Center](#), Montgomery County, Introduced December 20, 2026.

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Prince George's County, MD ⁵⁶	By-right land use in most zones. Data centers are not permitted near Regional Transit Districts, Local Transit Centers, or in Local Neighborhood Centers and Campus Centers as designated by the 2035 General Plan.	- Minimum green area is 10 percent, the minimum front yard setback is 25 feet, the minimum side and rear yards is 20 feet, and the building height shall not exceed 35 feet. - All exterior lighting shall be designed and constructed with cutoff and fully shielded fixtures that direct light downward and into the interior of the property and away from adjacent roads and properties. - Security fencing shall be screened by a minimum depth of 40 feet of vegetation from all abutting residential properties and public rights-of-way. - The applicant shall submit an acoustical study prepared by a professional acoustical engineer that demonstrates the use will not violate the maximum allowable noise levels. - Driveways shall be located so as not to endanger pedestrians or create traffic hazards.	No environmental or climate requirements other than conforming to the requirements of the County's Landscape Manual. Additional requirements apply in the rural (RR) zone: A qualified data center shall be located on land with a minimum acreage of 25 acres in size, at least 4,000 feet from a regional park, and the use shall be within a structure that is at least 300 feet from any residential use and at least 500 feet from any place of worship.

⁵⁶ Prince George's County Zoning Ordinance, [Section 27-5102 \(e\) \(4\) \(B\) Qualified Data Center](#).

A Review of Information on the Impacts of Data Centers

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Frederick County, MD ⁵⁷	Data centers and related electric substations are allowed in the Critical Digital Infrastructure Overlay Zone (CDI-OZ). The CDI-OZ may only be applied to land designated as Limited Industrial or General Industrial use. The CDI-OZ may cover no more than one percent of total county land area.	• Setbacks increased to 500 feet from any property line abutting residentially zoned or designated land. • Visual impact of the project on viewshed, surrounding properties, public roadways, including roadways with rustic, scenic, or historic designation, and historic sites will be avoided or minimized to the maximum extent practicable. • Vegetative screening must be placed between security fencing and the public view. Chain link or similar woven metal or plastic fencing not allowed. • Noise analysis that assesses impact of all noise sources and determines appropriate layout, design, and measures to ensure ongoing operations minimize noise in conformance with sound level standards by adjacent land use. • Other non-industrial uses in vicinity have been identified and negative impacts to these will be avoided or minimized to maximum extent practicable. • Ground level and roof top mechanical and electrical equipment, power generators, water cooling and storage facilities, utility substations, and other associated utility infrastructure to support sustained operations of infrastructure must be screened. • The siting of the proposed use will not have a negative impact that disproportionately affects overburdened communities or underserved communities as those terms are defined in Md. Code Ann., Environmental Article, § 1-701.	• Fragile ecosystems and watersheds in the vicinity have been identified, and negative impacts will be avoided or minimized to the maximum extent practicable. • Negative impacts on local, state, and federal recreational amenities and private parks will be avoided or minimized to the maximum extent practicable. • Generators must meet or exceed Tier 4 or equivalent emission standards as defined by the United States Environmental Protection Agency. • Only one fuel storage tank is permitted per critical digital infrastructure building, not to exceed 20,000 gallons. • The tract proposed to be utilized for a critical digital infrastructure use may not have a designation of no planned service (NPS) in the Frederick County Water and Sewerage Plan. • The tract of land proposed to be utilized for a critical digital infrastructure use may not be located within a priority preservation area (PPA), a rural legacy area (RLA), or a treasured landscape management area.

⁵⁷ Frederick County Zoning Ordinance, [§ 1-19-10.1100. CRITICAL DIGITAL INFRASTRUCTURE OVERLAY ZONE \(CDI-OZ\)](#) and [§ 1-19-8.402. CRITICAL DIGITAL INFRASTRUCTURE FACILITIES](#).

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Fairfax County, VA ⁵⁸	Permitted by-right or allowed by special exception in two commercial districts (Office and High Intensity Office) and five industrial districts (Low Intensity Industrial To Heavy Industrial). Allowed by special exception in Planned Development Commercial and Planned Tysons Corner Urban districts.	- Any equipment necessary for cooling, ventilating, or otherwise operating the facility, including power generators or other power supply equipment (except solar panels), must be fully enclosed. - Must be located at least 200 feet from lot line of any Residential use (unless permitted by special exception). If the building is located less than 200 feet from a residential use, it should include changes in building height or other design techniques to provide variation in building mass as viewed from the nearby residential district. - Prior to site plan approval, a noise study must be submitted demonstrating that operation of the data center will comply with Noise Ordinance, Chapter 108.1 of the County Code.	- Energy transmission and usage are regulated at the state level by the State Corporation Commission. Aside from the context of zoning incentives, the Virginia Code does not authorize the County to regulate energy efficiency or to require the use of renewable energy directly through the Zoning Ordinance.⁵⁹ - Emergency backup generators used by data centers are regulated by the Virginia Department of Environmental Quality (VDEQ) and the County does not have the authority to impose more stringent emissions standards.⁶⁰ - If a cooling tower discharges to the stormwater system, permitting is required by VDEQ, with effluent limits established for certain pollutants. - Additional environmental measures may be required through the special exception process.

⁵⁸ Fairfax County Zoning Ordinance, [Adoption of an Amendment to Chapters 112.1 and 112.2](#), September 10, 2024.

⁵⁹ Fairfax County, [Proposed Zoning Ordinance Amendment Data Centers Staff Report](#), May 17, 2024.

⁶⁰ Ibid.

A Review of Information on the Impacts of Data Centers

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Loudoun County, VA ⁶¹	Requires Special Exception (SPEX) approval from the Board of Supervisors for data center use in the in the Industrial Park (IP), General Industry (GI), and Mineral Resources-Heavy Industry (MR-HI) zoning districts.	- When a data center is adjacent to property with existing residential development: parking must be setback at least 50 feet and structures must be setback at least 200 feet. - Except for generator testing, generator use is limited to backup/emergency use only when data centers are adjacent to residential developments. - Subject to the Noise Study standards and maximum sound levels by land use type. - When a data center is adjacent to property with existing residential development, mechanical equipment on the exterior of the property must be screened on all four sides by an acoustical barrier designed to protect neighboring properties from noise pollution. - Must include a photometric plan that shows all exterior lighting, including any security lighting, subject to maximum illumination standards.	- Must follow State of Virginia standards outlined above. - No explicit local references to environmental or energy use standards.

⁶¹ Loudoun County, [Phase 1: Project Plan for Data Center Standards & Locations](#).

Loudoun County, [Zoning Ordinance Chapter 4: Use-Specific Standards > 4.06.02 Data Centers](#).

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Prince William County, VA ⁶²	Within the Data Center Opportunity Zone Overlay District, data centers permitted by-right in office and industrial districts. Outside of the Overlay District, data centers require special use permit approval in commercial, office, industrial districts, and mixed-use districts. Prohibited in agricultural, residential, neighborhood business, and village districts.	- Ground level and roof top mechanical equipment shall be screened from major arterials, interstates and abutting residentially zoned or planned properties. - A buffer yard is required to screen the data center from adjacent residentially zoned or planned properties. - Principal building façades shall avoid the use of undifferentiated surfaces.	- Must follow State of Virginia standards outlined above. - Sustainability guidelines (recommended but not required to be incorporated) include:⁶³ - Minimize land disturbance and maximize on-site tree preservation, with minimum of 10 percent of a site to be preserved as natural open space. - Minimize habitat disturbance and provide wildlife corridors. - Reduce, control, and treat surface runoff through effective storm water practices that treat the quantity and quality of runoff. - Incorporate heat reflective roofing. - Use sustainable building materials in the construction.
Susquehanna County, PA ⁶⁴	Generally restricted to designated commercial or industrial districts as dictated by local municipal zoning.	- Data Center Owner and Operator, at its expense, must complete decommissioning of the Facility within twelve months after end of useful life of the Facility. Decommissioning shall include removal of all hazardous materials and contents, including cabling, electrical components, and any other associated facilities. - Intensity, height and shielding of lighting shall provide for adequate and proper safety and shall not be a nuisance or hazard to drivers and residents of adjacent properties. - The Applicant shall make all efforts to avoid any disruption or loss of radio, telephone, television or similar signals, and shall mitigate any harm caused by the Data Center.	- All new data centers and qualifying expansions must employ closed-loop cooling for server racks and IT equipment. Anti-freeze or heat-transfer fluids used in closed loops must be non-hazardous where feasible. - No Data Center shall be approved unless the water feasibility study demonstrates that the anticipated water supply yield is adequate for the project and that the proposed water withdrawals and discharges will not endanger or adversely affect the quantity or quality of groundwater or surface waters in the vicinity. - Applicants must include a plan showing how the design minimizes energy and water use (Power Usage Effectiveness targets, closed-loop heat recovery opportunities).

⁶² Prince William County Zoning Code, [Part 509. - Data Center Opportunity Zone Overlay District](#).

⁶³ Prince William County, [Data Center Overlay District Design Standards DRAFT](#), May 2, 2022.

⁶⁴ Susquehanna County, [ORDINANCE NO.2025-01](#), December 29, 2025.

A Review of Information on the Impacts of Data Centers

Jurisdiction	Allowable Zones	Design and Quality of Life Requirements	Environmental and Energy Requirements
Unincorporated Linn County, IA ⁶⁵	Large-scale facilities are only permitted in the large-scale data center district. Small-scale data centers are allowed through the standard conditional use permit process in agricultural, general commercial, or industrial districts.	• 200-foot setbacks to all property lines, and 1,000-foot setbacks from residentially zoned property or place of public assembly. • Applicants must identify and mitigate damages to public infrastructure including roads, street access, and drainage systems. • Hourly noise level shall not exceed 55 dBA as measured from outer wall of any occupied structure within residentially zoned property. • Agreement for the creation of a Community Betterment Fund or similar mechanism to support public infrastructure, services, environmental protection, workforce development, or other community benefits, as determined by the Board of Supervisors.	Approval of large-scale facilities require: • The applicant demonstrates there is sufficient reliable water supply to meet all projected water demands without undue adverse impacts on existing users, aquifers, or watersheds. • A Waste Management Plan detailing how construction waste will be handled. • Written verification from their proposed power provider that the applicant has calculated the maximum planned electrical consumption of the proposed use and has verified the utility supply and related electrical infrastructure is sufficient to accommodate the applicant's proposed use.

⁶⁵ Linn County Iowa, [Data Center Ordinance](#).

Chapter 8. Findings

The Council requested this Office of Legislative Oversight (OLO) report to better understand the potential impacts from building data centers in Montgomery County. Montgomery County has four data centers: two in Silver Spring, one in Germantown, and one in Rockville. Two are large, detached data centers and two are co-located within office buildings and lease out space to third-party entities.

This chapter presents OLO's findings on the impacts of data center development, drawn from a review of publicly available information and data on jurisdictions that have authorized the building of data centers. These impacts fall into several broad categories: economic effects on local employment, wages, and home prices; environmental and infrastructure effects on regional water systems, the electrical grid, and environmental quality; and disproportionate impacts on Black, Indigenous, and People of Color (BIPOC) communities and communities with lower incomes.

The chapter also highlights opportunities that other jurisdictions have used to balance community impacts with community protections that respond to residents' concerns. Together, these findings inform the recommendations presented in Chapter 9.

Background on Data Centers

Finding #1. Data centers are centralized physical facilities that house information technology (IT) infrastructure including servers, data storage systems, and networking equipment used to store, manage, and process digital information.

Data centers are critical infrastructure for internet, streaming services, global communications, and business transactions, among other uses. People interact with data centers every day through typical online activities like email, streaming, and online shopping. Data show that global demand for data centers has grown by 20 percent each year due to increased internet traffic, widespread cloud storage use, and the rapid adoption of artificial intelligence (AI) models that require significant computing power. Data centers, especially large ones, require continuous electrical power, precise cooling of equipment, secure infrastructure, and reliable network connectivity to function.

Finding #2. The U.S. Department of Commerce estimates there are approximately 5,000 data centers in the U.S. Northern Virginia is currently the world's largest data center hub, with over 500 centers in Loudoun, Fairfax, and Prince William Counties.

Northern Virginia's "Data Center Alley" in eastern Loudoun County "has the highest concentration of data centers in the world with approximately 250 data centers built and more than 100 in the development pipeline," according to a white paper by Loudoun County Vice Chair/Ashburn Supervisor Mike Turner. Growth has been fueled primarily by increased use of artificial intelligence (AI). In past decades, data centers provided cloud storage service and hosting platforms for organizations. The

recent construction boom will provide the infrastructure to host generative AI and other AI tools that require significant computing power.

Finding #3. An analysis of the likely environmental, energy, and economic impacts of data center development in Maryland is due to the Maryland General Assembly and the governor by September 1, 2026.

Required by a law adopted by the Maryland General Assembly in 2025, the analysis is being conducted by the Maryland Department of the Environment, Maryland Energy Administration, and the University of Maryland (UMD) School of Business, with assistance from Maryland Department of Legislative Services.

Finding #4. An Executive Regulation implemented a moratorium on processing building permits related to data centers in Montgomery County until mid-December 2026. At the same time, the Council is considering legislation and a zoning text amendment related to data centers in the County.

The regulation paused movement on one proposed data center in Montgomery County. Terra Energy submitted a plan to build a 360 MW hyperscale data center and battery energy storage facility on the site of a decommissioned coal fired power plant in Dickerson, MD. If approved, the California-based company Atmosphere Data Centers would construct a Tier III+ data center on 170 acres with a 2,000 MW electricity storage facility adjacent to the site.

The Council is in the process of reviewing legislation that would impose moratoriums on data center projects in the County and a zoning text amendment that would define and regulate data centers.

Economic Impacts of Data Centers

There is limited systematic empirical evidence on the local economic impacts of data centers despite a small but growing set of rigorous studies on jobs, wages, business activity, housing, and electricity prices. Given the state of the field, OLO performed a targeted search for empirical studies on the local economic impacts of data centers and synthesized their findings. OLO focused on identifying studies with methodologies capable of producing valid findings on the causal impact of data centers.

Finding #5. Counties with data centers have experienced clear gains in employment of specialized data-processing workers, along with short-term increases in construction jobs. However, data centers have generated far fewer permanent local jobs than similarly costly manufacturing plants, and their overall employment effects at the county level have been modest.

Counties more exposed to data center growth experienced persistent increases in data processing employment. However, data centers usually employ only a modest on-site workforce, typically between 30 and 100 permanent staff, with employment at some very large hyperscale campuses reaching the

low hundreds. Data center construction creates *temporary* demand for local construction workers, electricians, HVAC technicians, and related trades.

Studies have found data center expansion or entry in a jurisdiction was associated with modest increases in total county employment. Research findings show that impacts on total employment were highly conditional, with employment gains larger in metropolitan counties, Big Tech-owned facilities, and counties that attract multiple centers, and with negligible employment effects in many rural counties or those with only one facility.

At the same time, counties with data centers have seen modest increases in average wages and median household income, with research showing wage and income gains uneven across counties, with some locations seeing larger increases than others. These findings are consistent with the finding that data centers bring in relatively higher-paying jobs and raise average earnings even though job counts grow only modestly.

Finding #6. Counties with data centers have seen modest increases in local business establishments, though the scale of these gains is smaller than for comparable manufacturing investments. Increases in business establishments have been uneven across counties, with some locations seeing more pronounced growth than others.

The studies reviewed find that data centers are linked to more local firms. One study shows that counties more exposed to cumulative data-center revenue experienced increases in the number of business establishments across horizons. A second study similarly estimates that building of a data-center raised the number of business establishments over the first three years after entry.

Finding #7. Local economic impacts from data centers have been highly uneven and contingent on local conditions, facility characteristics, and timing of when investments were made.

- **Metro vs. nonmetro:** Gains in employment, total wages, and building permit activity at the county-level have been concentrated in metropolitan counties, with little or no statistically significant change in these indicators for non-metro counties.
- **Clustering of facilities:** Counties that received additional data centers within five years of their first entry experienced substantially larger increases in employment, wages, establishments, and building permit activity than counties with isolated entries, suggesting that early clustering has amplified local economic benefits.
- **Operator type:** Big Tech hyperscale facilities have generated larger local gains in employment, wages, and business establishments than third party or enterprise data centers, implying weaker evidence of strong impacts from smaller scale investments.

- **Entry timing:** Earlier first-entry cohorts (data centers built pre-2010 and 2010–2019) have experienced clearer gains in county-level employment, wages, and business establishments, whereas the post-2020 cohort has shown negligible or statistically insignificant effects so far, suggesting either diminishing returns or that there has not been enough time for benefits to materialize in the post-2020 cohort.

Finding #8. Data centers have lowered prices for homes very close to large data center facilities, with effects that persist for years and become stronger when jurisdictions host more large data centers. Impacts on housing prices decline as you move further away from data centers and when data centers are located in industrial or commercial zones, instead of residential zones.

In two studies, researchers found that homes close to data centers (0.5 miles and 4 km) sold for lower prices compared to homes further away (2 miles and 5 km). Data show depressed home prices persisted for years after data centers entered a jurisdiction and became stronger as jurisdictions hosted more large facilities. Nationwide, researchers saw sizeable declines in house prices only when large non-hyperscale data centers were located in highly residential areas.

Finding #9. Despite the impact on home prices described in Finding #8, the evidence suggests that data center development in one jurisdiction has not generated comparable negative spillovers for nearby housing markets just across zoning or county boundaries.

Nationwide, homes within 5 km of a hyperscale facility experienced pronounced price declines relative to homes 20–50 km away when located in the same zoning and regulatory jurisdiction as the facility. At the same time, similarly proximate homes located just over jurisdictional boundaries showed little or no comparable price losses.

Fiscal Impacts of Data Centers

Finding #10. Data centers are a meaningful source of tax revenues for some jurisdictions, including Loudoun County and other parts of Northern Virginia. However, they may also lead to higher government expenditures to accommodate them (e.g., road infrastructure, electricity distribution upgrades, water and sewer extensions).

Loudoun County—and to a lesser extent Prince William County—in Northern Virginia now rely heavily on data centers as a source of tax revenue, with personal property taxes on data center computer equipment budgeted at about \$795 million in FY 2025. Although data centers are a valuable revenue source, they may also raise government output and spending to accommodate data center projects. Preliminary evidence from a multi-county study suggests that, in the first couple of years after a data center tax abatement, counties often finance short-run accommodation costs through increased county borrowing rather than through use of growing tax collections.

Finding #11. Tax abatements and exemptions targeting data centers are a common feature of state and local data center tax policy and appear effective in attracting data centers. However, some states have recently curtailed or proposed phasing out tax incentives for data centers, with others considering data center-specific taxes.

Most states offer tax incentives for data centers, such as exempting data centers from sales and use taxes on tangible equipment or offering abatements for property taxes. These tax incentives often condition eligibility on meeting minimum capital investment and full-time employment requirements. Evidence from one study suggests that these incentives have been effective at attracting large facilities, increasing the likelihood and scale of new hyperscale data center construction in adopting states. However, by 2026, many states had introduced legislation to reassess or curtail data center tax incentives, including proposals to phase out exemptions or limit their duration. A few states have proposed legislation to impose new taxes on data centers.

Finding #12. Maryland law exempts personal property from state sales and use tax for qualified data centers. Maryland law also allows a county to adopt laws reducing or eliminating the assessment of tax for personal property used in a qualified data center.

To qualify for tax exemptions or reductions, companies must apply for and be granted the sales and use tax exemption by the Department of Commerce. Property exempt from the tax includes computer equipment, air conditioning and mechanical systems, and equipment related to energy generation and use. To qualify, a data center must invest in a minimum amount of qualified personal property (\$2 million or \$5 million) and create at least five qualified positions. The exemption can last for 10 or 20 consecutive years based on the amount of investment. Montgomery County has not adopted a law reducing or eliminating the assessment of tax for personal property used in a qualified data center.

Electricity Use of Data Centers and Their Impacts on Energy Prices

Finding #13. Building and operating data centers in the U.S. has caused an explosive demand for more electricity that is straining power grids. Growth has been fueled primarily by increased use of artificial intelligence. In 2024, data center electricity usage accounted for 4.7 percent of total U.S. electricity consumption.

Data centers are often described in terms of how much energy they draw in a given moment to operate. For example, smaller, edge data centers may use around 100 kilowatts (kW) to 2 megawatts (MW) of electricity at any given moment. A hyperscale data center may use 50 MW or more of electricity at any given moment.

Federal researchers find data center energy use is increasing at an accelerated rate, growing approximately 7 percent from 2014 to 2018, and 18 percent from 2018 to 2023. Researchers estimate

that data centers' energy usage could constitute between 9.5 percent and 15.3 percent of total U.S. energy usage by 2030.

In 2024, U.S. data centers used 192 terawatt-hours (TWh) of electricity. For context, one megawatt of electricity can power about 500 to 1,000 U.S. homes in a given moment. One gigawatt (GW) equals 1,000 megawatts and can power the energy demand of a major U.S. metropolitan area in a given moment. A typical nuclear reactor produces approximately one gigawatt of electricity every moment. One terawatt (TW) is equal to 1,000 gigawatts.

Finding #14. PJM Interconnection, L.L.C. coordinates the electrical grid in all or parts of the District of Columbia and 13 states, including Maryland. PJM has not been able to buy enough electricity to meet its threshold reliability requirements. Its ability to increase the amount of electricity available to users is constrained by very slow times to connect new sources of electricity to the grid.

PJM Interconnection, L.L.C. (PJM) is a Regional Transmission Organization (RTO) that is regulated by the Federal Energy Regulatory Commission (FERC). Seven RTOs in the U.S. manage the electrical grid and wholesale power markets for approximately two-thirds of the country.

PJM oversees both the Pepco and BGE zones that serve Montgomery County, Maryland, and the Dominion zone that serves Loudoun County and other Northern Virginia localities. PJM manages the regional high-voltage transmission grids and operates wholesale electricity markets in areas under its control.

In a July 2026 auction, PJM secured 138,318 MW of electricity for future use—6,831 MW below the amount needed to meet reliability requirements. PJM has reported that energy demand is growing faster than supply.

In 2025, it took U.S. energy suppliers an average of five years from a request to connect to the electrical grid to commercial operations. Data specific to the PJM grid show the average time for interconnection at over eight years. “[A]s of the end of 2025, more than 2,060 gigawatts of generation and storage capacity were actively seeking grid connection nationwide which [would] more than double the country's entire installed generating capacity.”

The U.S. Department of Energy directed FERC to speed up the process of interconnecting large energy users, such as data centers, to the energy grid. FERC subsequently took action to force PJM to amend its tariff schedule (PJM's official schedule of prices and rules governing its operation of the grid) to decrease its connection times. PJM's response is due in mid-August 2026, and FERC must approve any changes to PJM's tariff schedule.

Finding #15. Due to increasing demand for electricity (in part from increasing demand from data centers operating in the region) and structural barriers to quickly increasing energy supply, PJM’s electric grid is moving from long-standing energy surplus into a period of energy scarcity and risks falling below its reliability standards by June 2027.

Surging Demand: Historically, the PJM region experienced minimal growth in total electricity use: from 1998 to 2023, net energy for load increased from about 718,000 GWh to 768,000 GWh—roughly 7 percent over 25 years. Today, however, PJM forecasts much faster demand growth driven largely by the rapid expansion of energy-intensive data centers in Northern Virginia and other parts of its footprint, alongside broader electrification of buildings, transportation, and industry. PJM now expects energy demand to increase at levels significantly higher than its earlier outlooks.

Constrained Supply: PJM’s independent market monitor concludes that “the current supply of capacity in PJM is not adequate to meet the demand from large data center loads and will not be adequate in the foreseeable future.” PJM explains that this shortfall reflects structural constraints on the supply side:

- Dispatchable plants, which can be turned on and off on demand to adjust to real time energy needs, are retiring faster than new ones can replace them, especially older fossil fuel plants;
- New generation power plants take significantly longer to build because of supply chain bottlenecks and permitting and interconnection delays; and
- The existing capacity market design for electricity is not attracting sufficient new investment given sharply higher capital costs, longer construction timelines, and volatile federal and state policies that make future revenues harder to predict. PJM stresses that this is “not a temporary market condition,” but a structural shift in what investors require to finance large, long-lived assets that generate energy.

Finding #16. Energy demand from data centers, especially those powering emerging AI technologies, like generative AI, may cause the PJM grid to fall below reliability standards by June 2027, according to PJM. If PJM’s region does fall below reliability standards, it will increase the risk of rolling blackouts, especially during extreme hot and cold weather, which strains the electrical grid.

The more energy reliability is affected, the more data centers will need to depend on power outside the grid, such as microgrids, backup diesel generators, and/or other sources of power. Recently during a July 2026 heatwave affecting the Eastern U.S., the U.S. energy secretary instructed grid operators, like PJM, to require data centers to use backup generators and other power suppliers to ease strain on the electrical grid.

Escalating demand for electricity and structural barriers to increasing energy supply have driven up utility costs for Maryland residents, including Montgomery County. Given that PJM’s current market

structure cannot induce sufficient new investment to expand supply fast enough to meet rising energy demands, prices are projected to remain elevated without outside intervention.

PJM's market monitor and the Maryland Office of People's Counsel (OPC), the state's independent ratepayer advocate, find that rapid data center growth in the PJM region is already substantially increasing energy bills for Maryland households and businesses by raising transmission costs, wholesale energy prices, and capacity charges. OPC has argued to the federal government that "residential customers should not be responsible for any of these costs caused by the massive electricity demands of data centers or by projections of significant data center growth."

PJM's own forecasts show that most of the region's future electricity demand growth is concentrated in Dominion's territory in Northern Virginia, not in the utilities that serve Montgomery County and Maryland. In its latest 2026 forecast, PJM anticipates that Northern Virginia's Dominion zone will experience much higher annual demand growth than Pepco and BGE in terms of net energy load as well as summer and winter peak loads. Although most of the new data center load is located outside Maryland's borders, Montgomery County Government's FiberNet makes use of cloud services, search, streaming, and AI applications that those facilities support.

PJM has said that its current market structure cannot, on its own, generate enough new electricity to expand supply fast enough to close the gap, which is why electricity prices are rising and projected to remain elevated rather than inducing the usual corrective wave of new supply.

In October 2025, the U.S. Department of Energy (DOE) directed the Federal Energy Regulatory Commission (FERC) to speed up the process of interconnecting large energy users, such as data centers, to the energy grid. In June 2026, FERC, which regulates the interstate electric grid, issued an order finding PJM's tariff related to large energy users was "unjust and unreasonable." FERC determined that PJM's tariff cannot adequately handle the surge of new electricity customers trying to connect to the grid. It ordered PJM to respond within 60 days to explain why its current rules are sufficient or propose ways to fix the issue. PJM's response is due mid-August 2026.

Finding #17. Maryland's 2026 Utility RELIEF Act changed Maryland law related to new large businesses in the state that use a significant amount of electricity, which include some data centers.

Some provisions of the Utility RELIEF Act apply to new "large load" customers, business customers for electricity service that have a high monthly demand for electricity. The law defines a large load customer based on a company's monthly electricity demand and load factor (a ratio that measures how steadily and consistently a facility uses electricity) and applies to new large load customers or existing customers that become large load customers. This will include some data centers.

The General Assembly reduced the metrics in state law that define a large load customer – among other things reducing the aggregate monthly demand for electricity from 100 megawatts to 25

megawatts. The General Assembly included language in the law that states the changes are meant to shield residential retail electricity customers from increasing costs created by businesses that use significant amounts of electricity.

Under the changes in the law, large load customers have additional requirements related to state registration, infrastructure funding, and cost of electricity. Among other provisions:

- Utilities will be required to establish electricity rate schedules specifically for large load customers, which will not be allowed to purchase electricity under other rate schedules;
- Large load customers will be required to bear costs attributable to their use of electricity, including certain transmission and capacity costs and costs associated with connecting to the electrical grid; and
- New or expanded large load customers will be required to register with the Maryland Public Service Commission (PSC) and report data to the PSC that includes ownership and location data, operations data, energy and water use data, and information on backup generation.

The PSC will be required to develop a voluntary “Clean Capacity Rating Program” that provides platinum or gold ratings for large load customers that bring new clean electricity capacity. These customers will be prioritized for interconnection to the electric grid.

Environmental Impacts of Data Centers

Finding #18. Data centers use significant amounts of water for their operations, with water cooling systems accounting for the majority of consumption.

The three main ways water is used in a data center’s water footprint are:

- On-site water usage, which is mostly used for the cooling of facilities;
- Water use by power plant facilities, which supply power to data centers; and
- Water consumption during the manufacturing of processor chips used in data centers.

Data centers cool facilities using water from utilities, on-site reservoirs, or nearby sources. Water drawn directly from municipal groundwater wells or aquifers can lower groundwater levels—especially in drought-prone or densely populated areas. Results can include reduced drinking water supplies and reduced stream flows in connected rivers and waterways.

Statistics on water consumption collected from technology companies and researchers include:

- In 2023, Google reported using over 5 billion gallons of water across its U.S. data centers, with 31% of its freshwater coming from watersheds with medium or high water scarcity.

- In 2023, data centers in Northern Virginia consumed nearly 2 billion gallons of water, a 63% increase from 2019. Data centers in Loudoun County used about 900 million gallons of water.
- The Environmental and Energy Study Institute estimates large hyperscale data centers can consume up to 5 million gallons per day, equivalent to a town of 10,000 – 50,000 people. For a mid-sized data center, the Lawrence Berkely National Laboratory estimates a typical facility consumes around 300,000 gallons of water a day, about as much as 1,000 U.S. households.

Finding #19. A report from the Interstate Commission on the Potomac River Basin cited data center growth as a contributing factor to regional projections for uncertain water availability in the future.

The study projects that by 2050, data centers in the Washington metropolitan area could use as much as 80 million gallons of water on peak operating days. The same study shows a small but increasing chance (1% in 2030 and 5% in 2050) that there will not be enough water in the Potomac River Basin to meet residents' water consumption demands while leaving enough water in the Potomac River to protect sensitive aquatic habitats. Uncertainty is further driven by rising temperatures due to climate change increasing the probability of more severe droughts.

Finding #20. The consumption of electricity is one of the largest drivers of air pollution associated with data centers.

Data centers operate 24/7 and consume significant amounts of electricity. A 2025 study published in *Cleaner Energy Systems*, a peer-reviewed scientific journal, found 99 percent of the total environmental impacts of a hyperscale data center in Virginia were from electricity consumption.

Many data centers receive their electricity from regional grids and currently, about 56 percent of the electricity used to power data centers comes from fossil-fuel generated energy. Byproducts of electricity generation include carbon dioxide, sulfur dioxide, fine particulate matter, and release of heavy metals, all of which can have negative impacts on environmental and human health.

In the United States between September 2023 and August 2024, data center operations were associated with 105 million tons of carbon dioxide emissions, 2.2 percent of overall emissions. Data centers' share of carbon dioxide emissions are projected to grow with the increase in the number of data centers and consequent growth in electricity demand.

Rapid growth of AI is also increasing greenhouse gas emissions associated with data centers. Cornell researchers found that by 2030, if the current rate of AI growth holds steady, there would be an additional 24-44 million metric tons of carbon dioxide associated with AI servers alone (not including data centers themselves), equivalent to adding 5 to 10 million cars to U.S. roads.

Finding #21. Data centers with on-site backup diesel generators are contributing to increases in local air pollution.

Data centers, especially larger data centers, use on-site diesel generators at times to meet energy demand for operations. Diesel generators produce nitrogen dioxide, smog, and fine particulate matter, which are linked to respiratory and heart disease and decrease local air quality.

While backup generators are generally run for short periods, mainly for emergency power generation or for routine maintenance testing, data center emissions from diesel generators have grown substantially in recent years. A study in North Virginia showed PM 2.5 emissions from data centers were five times larger in 2023 compared to 2015. Continued data center growth in the area is likely to result in continued increases in PM 2.5 emissions. Data show communities living within a mile of a data center have higher air pollution burdens compared to the national median (above the 50th percentile of air pollution). This includes PM 2.5, nitrogen dioxide, and other pollutants.

Finding #22. Water cooling systems in data centers are not only associated with large water consumption but may also decrease nearby water quality due to chemical runoff from data center operations.

An open loop water system discharges remaining water, which is evaporated in a cooling tower to dissipate heat into the environment. During this process, high concentrations of salt and other contaminants (magnesium, sulfate, and potassium) released from the cooling process are flushed out of evaporative cooling towers using fresh water, known as “blowdown.” Data centers using evaporative cooling release contaminants back into the environment, which can contaminate groundwater supplies and pose serious health risks when concentrations increase (e.g., high sulfate levels in groundwater can lead to skin irritation and diarrhea).

Further, PFAS (i.e., “forever chemicals” that are long lasting and break down slowly over time) are used in data center cooling systems, both as non-water liquid coolants in water cooling systems and in air cooling. PFAS may be introduced into the surrounding environment during the flushing of evaporative cooling towers in data centers. Direct PFAS pollution can occur when data centers use PFAS to cool servers and suppress fire.

Finding #23. Data center operations can further exacerbate the effects of climate change, locally and regionally.

Many of the impacts of data center operations on air, water, and loss of agricultural land and woodlands contribute to climate change.

- Data centers are an emerging contributor of greenhouse gas emissions, responsible for 2.2 percent of overall U.S. emissions from 2023-2024. The projected rapid growth of data centers will further increase their share of emissions, which will likely exacerbate climate change.

- As world temperatures rise due to climate change, data centers' electricity demands for cooling (and for operation in general) compete for the limited available supply of electricity.
- Data centers large physical footprint creates impervious surfaces such as concrete and asphalt, which can lead to higher localized heat (known as urban heat island effect), higher flood risk due to surface runoff, and loss of greenspace.

Finding #24. Converting large areas of land for data center development can impact local ecosystems and the built environment.

Impacts can include:

- Indirect health and climate impacts due to loss of green space, such as increased heat exposure;
- Decreased capacity of natural green spaces' services of filtering water and air; and
- Replacing vegetation with impervious surfaces, which can impact water quality and increase flood risks.

Increasingly, data centers are being planned in rural agricultural lands (67% of planned projects in 2026). Similar to agriculture, data centers are land, water, and energy intensive so agricultural uses would likely need to compete with data centers for limited resources. Further, farmland conversion to industrial use is generally permanent and land is rarely returned to production for crops due to the need for intensive soil remediation after industrial use.

Finding #25. Some emerging strategies can decrease the negative impacts on the environment associated with data center construction and operation.

In general, data center operations are energy and water intensive and require large amounts of land for facilities. However, some negative impacts can be decreased through the following mitigation actions:

- **Increase available renewable energy** – This includes increasing the share of renewable energy used to power the local electrical grid and requiring data centers to bring their own clean energy, such as microgrids.
- **Use less water-intensive cooling methods** – This can include using recycled or non-potable water in water cooling systems, closed-loop water systems that consume far less water compared to open loop systems, and immersion cooling, which uses synthetic oil to cool servers through submersion.
- **Limit the building of data centers in certain zones** – Converting agricultural land and greenspaces into industrial uses like data centers can have indirect health and climate impacts due to loss of green space and decrease the capacity of natural green spaces' services of filtering water and air. Local governments can limit the building of data centers in areas that would be most impacted environmentally, such as near waterways or in protected ecological areas.

- **Improve data center efficiency** – Opportunities exist to improve the operational efficiency of data centers through more efficient hardware, AI algorithms, cooling systems, and adjusting computer power during peak energy periods to be more energy efficient. Local governments, through development or contract negotiations, can require data centers to use the most efficient technology.
- **Use tools such as Community Benefit Agreements (CBAs) to require data centers to decrease environmental impacts** - CBAs are legally binding contracts between a jurisdiction and an entity, such as a data center entity and allow governments to shape how an entity will operate in its jurisdiction. CBAs can be used to require data centers to be transparent with their electricity and water consumption, set limits on water consumption, use clean, renewable energy, and contribute funds that can be used for community sustainability and infrastructure upgrades.

Impacts on Areas Adjacent to Data Centers

Finding #26. Due to their form, height, and energy output, the appearance of data centers can cause visual impacts on adjacent neighborhoods.

Local jurisdictions in the Washington metropolitan region have adopted requirements related to viewscales and light pollution from data centers. Examples of these requirements include screening, fencing, and landscape buffers, minimum setbacks from residential areas, maximum building height, variation in building height and mass, and outdoor lighting standards to reduce spillover, including the use of motion sensors and dimming controls, downward facing beams, and warmer color light.

Finding #27. Data centers emit constant noise from the humming of cooling fans, transformers, and HVAC ventilation that can be disruptive to nearby homes, businesses, and other community facilities.

A Virginia state commission on data centers described the persistent noise as an industrial-scale drone or hum similar to amplified house air conditioning, with levels ranging between 40 and 59 decibels. Smaller backup diesel generators reportedly reach 85 decibels while larger units can approach 100 decibels, equivalent to a motorcycle or jackhammer. Research has linked noise pollution with an increase in mental health concerns and poor school performance. Measures to reduce impacts on noise pollution from data centers include equipment and building soundproofing, quieter cooling technologies, and land use planning that locates facilities far from residential and commercial areas.

Data Centers and Racial Equity and Social Justice

Finding #28. RESJ leaders, advocates, and organizers have identified the rapid expansion of large-scale data centers as the next major front of the Environmental Justice Movement.

Environmental justice is an area of racial equity and social justice (RESJ) that focuses on the just treatment and meaningful involvement of all people in environmental decisions, ensuring full protection from disproportionate environmental and health hazards, and equitable access to a healthy, sustainable, and resilient environment. This focus was born from the Environmental Justice Movement to combat environmental racism – the disproportionate exposure of Black, Indigenous, and other People of Color (BIPOC) and people with low incomes throughout the U.S. to harmful environmental conditions.

Environmental justice struggles across several decades have revealed several racial inequities that characterize environmental racism; these include:

- **Inequitable siting of hazardous facilities**, where hazardous facilities – such as major roadways, toxic waste sites, landfills, and chemical plants – are frequently sited in BIPOC communities;
- **Lack of engagement with BIPOC communities** in government decision-making that makes BIPOC communities more susceptible to harmful environmental decisions;
- **Inequitable environmental protections and benefits**, where systematic underenforcement of existing environmental laws and lack of public and private investment in environmental amenities make BIPOC communities more susceptible to disproportionate environmental impacts; and
- **Cumulative impacts** to health, well-being, and quality of life in BIPOC communities as they become overburdened with hazardous facilities and other environmental and social stressors.

There is mounting evidence data center development is disproportionately impacting BIPOC and low-income communities throughout the U.S. Seeing familiar patterns of environmental racism, RESJ leaders, advocates, and organizers have identified the rapid expansion of large-scale data centers as the next major front of the Environmental Justice Movement. In August 2025, the National NAACP convened nearly 100 partners to develop the [Data Center Frontline Framework](#) as a unifying guide for communities working to stop harmful data centers and build cleaner alternatives.

Finding #29. Large-scale data centers have impacts on the environment, utility costs, public health and community engagement that can disproportionately burden BIPOC community members while providing limited economic development benefits.

Research from RESJ advocates and organizers in [The People's Report](#) (by the NAACP and the Center for Engagement, Environmental Justice, and Health) and [The People Say No](#) report (by MediaJustice) suggests BIPOC communities are particularly susceptible to being overburdened by cumulative impacts

from data centers. Based on the impacts described in these reports and local racial inequities and disparities, data center development in the County could disproportionately burden Black and Latinx community members through:

- Potential increases to water rates;
- Increasing energy burdens through potential increases to electricity rates;
- Forgone land for other important community needs;
- The climate burden of increasing greenhouse gas emissions from fossil fuels;
- Public health burdens from worsening water quality, increasing energy burdens and exacerbating climate change; and
- Potential lack of transparency and community engagement in data center development process.

Black and Latinx community members could also be overburdened by air and noise pollution from data centers, especially if they are sited in communities that already face high burdens from cumulative impacts. Both reports suggest the costs of large-scale data centers to communities likely outweigh their economic development benefits through job creation and tax revenue.

Finding #30. RESJ advocates and organizers offer several promising practices to help mitigate the negative RESJ impacts of large-scale data centers.

To mitigate the negative RESJ impacts of large-scale data centers, RESJ advocates and organizers propose five promising practices that align with the Data Center Frontline Framework:

- **Halt data center development** either temporarily to adopt measures that will mitigate negative RESJ impacts or permanently to prevent negative RESJ impacts.
- **Increase transparency** through negotiating data center development in public and requiring public disclosure of energy use, water consumption, backup generator use, and facility-specific emissions.
- **Increase community engagement** in data center development by creating an oversight board that reflects and centers the lived experiences of impacted community members to review data center development applications, monitor compliance, and ensure approval decisions align with County climate and RESJ goals.
- **Require environmental justice and cumulative impacts assessments** for data center developments that evaluate additive impacts, identify sensitive receptors, incorporate environmental justice mapping tools, and include an individualized, community-driven mitigation plan.

- **Condition data center development on renewable-energy sourcing** that commits data center developments to a renewable energy compliance plan, **enforceable community benefits agreements** that specify required benefits for data center projects, **and fines for non-compliance** that go towards an environmental justice fund for climate mitigation.

Approaches to Regulation of Data Centers

Finding #31. Local governments have taken a variety of approaches to regulate the development of data centers. Some jurisdictions limit where data centers can be located in a specific area, some limit data centers based on size, and some regulate data centers based on their purpose and design.

Several jurisdictions require data centers with large square footage or electrical capacity to go through a more stringent development process compared to smaller data centers. For example, the City of Tucson, AZ is proposing to define a “large-scale data center” as any data facility with a gross floor area greater than 25,000 square feet or uses greater than 20 megawatts (MW) of energy. Large-scale data centers would only be allowed through a rezoning or major amendment to a Planned Area Development or Planned Community Development, which are subject to Mayor and Council review.

Localities can have different standards for data centers as accessory or principal uses. Accessory use data centers are typically constructed to serve the IT uses on the property. Principal use data centers provide data processing and storage to users offsite. Principal use data centers are typically much larger in scale, energy impact, and infrastructure needs than accessory use data centers. Thus, some localities permit smaller, accessory use data centers by-right while requiring discretionary approval for larger, principal use data centers.

Finding #32. Jurisdictions in the Washington metropolitan area use a variety of methods to review and approve data center applications. Some offer a mix of by-right and special exception, some offer only conditional or special exception approvals, and some use overlay districts to govern where and how data centers can be built.

Based on a review of local ordinances, the typical way jurisdictions in the Washington metropolitan area permit data centers is through a conditional use or special exception approval process. Both processes require public hearings where residents can participate and provide input. At the time of writing, data centers in Montgomery County are allowed by conditional use in all zones.

In Prince George’s County, data centers are allowed by-right in most zones except local transit centers and local neighborhood centers. In Loudoun County, data centers may only be permitted by special exception approval in the Industrial Park, General Industry, and Mineral Resources-Heavy Industry zoning districts. In Fairfax County and Prince William County, data centers are permitted by-right in certain office and industrial zones but require special use exemptions in other districts. Frederick

County and Prince William County established data center overlay zones to direct the development of data centers to areas where existing infrastructure exists and place additional rules on development to address specific geographic, environmental, and community goals.

Finding #33. Regulations related to data center energy and water usage, efficiency, and infrastructure are being pursued and implemented at the state and local levels. Examples include energy efficiency standards, water recycling or closed-loop requirements, and decommissioning plans.

Unlike most commercial or industrial uses, data centers require uninterrupted power for servers and cooling systems to operate continuously. Power Usage Effectiveness (PUE) describes the ratio of the total amount of energy consumed by the entire facility to the energy delivered solely to the IT computing equipment. The closer the PUE ratio is to 1.0, the more efficient the facility is. The City of St. Louis established conditional use permit provisions with the developer of a large data center that requires the facility to maintain a PUE of 1.25 or better, pursue a LEED or other green building certification, fund its own project-specific electrical infrastructure, and achieve at least 50 percent of the energy load from renewable sources within five years, among other provisions.

Susquehanna County, PA requires that all new data centers and qualifying expansions use closed-loop cooling for server racks and IT equipment. Susquehanna County also requires the data center owner and operator, at its expense, complete decommissioning of a facility within twelve months after the end of its useful life. Decommissioning includes removal of all hazardous materials and contents, cabling, electrical components, and any other associated facilities.

Finding #34. Local governments are exploring various mechanisms to mandate public reporting on energy and water use by data centers.

At the state level, the Utility RELIEF Act requires some data centers in Maryland with a monthly maximum demand of 25 MW or more to report information about monthly water usage and source, annual energy usage and source, onsite backup generation, and any other information the Public Service Commission deems necessary. The usage data for individual projects can be attained through a Maryland Public Information Act request after a project becomes operational.

Cities and counties may also institute their own reporting requirements. Linn County, IA's data center ordinance requires large-scale data centers (that have an electrical capacity greater than 20 MW or that use more than 50 gallons per minute of water) to complete a water study prior to approval and sign a water use agreement with the county. The agreement mandates the data center operator to track and report water use, share information about compliance with permits, and take steps to reduce water use during droughts or emergencies to protect public health, safety, and existing water users.

Finding #35. Community benefits agreements tied to data center development approvals have been used by localities to protect adjacent neighborhoods, establish environmental standards, and provide economic benefits to the community.

Localities can negotiate Community Benefits Agreements (CBAs) with data center developers to condition approval on legally enforceable provisions, which could result in financial compensation for the locality if provisions in the CBA are not met. The City of Lancaster, PA approved a CBA that requires the owner of two data centers built in the municipality to:

- Contribute \$10 million to the City's Economic Development Fund and \$10 million to a Sustainable Development and Clean Energy Fund;
- Commit to local hiring efforts for construction and permanent jobs;
- Adhere to noise, air, renewable energy, and water use standards; and
- Maintain a public website with project updates, timelines, permits, and a portal for questions or complaints.

The City of St. Louis, MO entered into agreement with a major data center developer that addresses noise, energy efficiency, water use, tax revenue, job requirements, and other investments into the community. Notable provisions of the CBA require the developer to:

- Contribute an estimated \$15 million (\$30 per square foot) to a city fund for use on multi-modal transportation enhancements and economic and environmental justice activities;
- Not seek local tax abatement incentives for the data center building;
- Meet escalating job creation minimums for 20 years;
- Comply with the City's hiring ordinance to prioritize City residents for entry-level jobs; and
- Annually report electricity usage, waste heat, and water usage, which may be made public.

Chapter 9. Recommendations

As data center growth continues to surge in the U.S., the Council asked the Office of Legislative Oversight (OLO) to review publicly available information and data about effects seen in other jurisdictions that have authorized the building of data centers. Building on OLO's findings, this chapter offers recommendations for how the Council can use its authority to try to capture the potential benefits of data center development while mitigating its most significant risks.

As noted previously, data centers are physical facilities that house information technology (IT) infrastructure used to store, manage, and process digital information. Data centers provide the world's access to services such as the internet, streaming services, global communications, and business transactions. Approximately 5,000 of the world's 11,000 data centers are located in the U.S.

Northern Virginia is the world's largest data center hub, called "Data Center Alley," with over 500 centers in Loudoun, Fairfax, and Prince William Counties. Indeed, a data center in Ashburn, VA is the hub for FiberNet, the County's flagship fiber-optic communications network, which enables the delivery of communication services for all County agencies, traffic cameras and signals, Montgomery County Public Schools, Montgomery College, Housing Opportunities Commission, the Maryland-National Park and Planning Commission, and WSSC Water.

State and local governments are looking for ways to balance the benefits and drawbacks of data centers. This raises several questions: Can data centers bring real economic benefits to a community? What are the potential downsides of approving one? And how can those downsides be reduced?

Several tools can help. Rapid advances in data center technology offer some ways to reduce community impacts. Government regulation offers others. Community input can help guide decisions along the way.

Legislatures are already regulating data centers in several ways to address their negative effects, such as:

1. **Zoning and legal requirements** — restricting where data centers can be built and mandating specific design standards as a condition for approval.
2. **Technology requirements** — requiring data centers to adopt certain technological improvements (e.g., energy efficiency, water use, noise reduction) as a condition for continued occupancy.
3. **Community benefit agreements** — requiring data centers to provide direct benefits to the communities where they operate.

As the Council considers these recommendations, it is important to distinguish between two distinct tools: the Council's conditional use authority and the option to negotiate community benefits agreements (CBAs) with data center developers.

Conditional use authority is a public, regulatory power. The County attaches binding conditions directly to a zoning approval, and enforcement is administrative: if a developer fails to comply with standards in a conditional use approval, the County has administrative, government-based remedies to enforce conditions. **A CBA is a private, contractual tool**, negotiated at the individual project level between the County and the developer with community input. It can impose monetary consequences for noncompliance and can address matters outside the County's zoning authority.

These tools work best together, not as substitutes for one another. Zoning conditions set the non-negotiable floor — such as location, setbacks, noise limits, energy usage, required technology, and backup power sources. A negotiated CBA can then layer on additional community and economic benefits — such as job quotas, local hiring preferences, contributions to community funds — that fall outside what zoning authority alone can require.

OLO offers the Council the following recommendations.

Recommendation #1. As the Council evaluates legislation and zoning text amendments related to building and operating data centers in Montgomery County, it should consider various approaches that can potentially mitigate adverse impacts.

In its conversations about the regulation of data centers with residents, stakeholders, and other government entities, OLO recommends the Council consider the types of impacts that data centers can have on communities—both negative and positive—including:

- Fiscal and economic impacts;
- Environmental impacts;
- Community impacts that affect quality of life; and
- Racial equity and social justice considerations from impacts on BIPOC residents and residents with lower incomes.

Research conducted for this report identified numerous measures that state and local jurisdictions, as well as data center operators themselves, are undertaking to help data centers contribute benefits to a community. OLO recommends the Council include the following in its consideration of data centers in Montgomery County.

- **Data Center Overlay Zones** – the Council should consider the benefits and drawbacks of establishing a data center overlay zone for the County in addition to the current conditional use application process. The conditional use process already requires careful planning, discretionary review, and public engagement. Establishing an overlay zone could allow for additional regulations to be placed on data center developments to address geographic, environmental, and/or community goals and align future siting decisions with infrastructure capacity.

- **Location Requirements** – the Council could consider restricting new large or clustered data centers to industrial zones and require minimum separation distances (at least 0.5 miles) from existing residential areas to limit highly localized visual, noise and other externalities that empirical studies have linked to lower nearby home values. If the Council pursues location requirements, it should consider if proposed zones are in close proximity to BIPOC communities since they may already be overburdened with environmental and social stressors.
- **Regulations Based on the Size of Data Centers** – examples include differentiating between large- and small-scale data centers by energy use, square footage, or a combination of the two; requiring a more in-depth review process or possible prohibitions for larger data centers.
- **Regulations on Data Center Design and Operation** – options include requirements related to allowable types of backup generators, restrictions on generator use and time of use, requirements to limit noise, outdoor lighting standards to reduce light pollution, requirements for battery storage, or requirements to maintain a specific Power Usage Effectiveness (PUE).
- **“Bring Your Own” Clean Energy** – requirements could include data centers supplying a percent of their annual electricity demand from on-site generation or contracted, dedicated off-site renewable energy generation.
- **Efficiency Requirements** – examples include requiring efficient hardware and technology, managing operations with efficient AI algorithms, and adjusting computer power during peak energy periods to be more energy efficient.
- **Limiting Water Use** – options include requiring data centers to use more water efficient, less consumptive cooling methods, such as closed-loop water systems, immersion cooling, or using recycled or non-potable water for water cooling systems.
- **Reporting Data** – the Council could consider requiring all data centers in the County to publicly disclose data on their facilities and operations. Examples include data related to energy use, water consumption, heat release, water discharge, backup energy systems, emissions, etc.
- **Racial Equity and Social Justice Assessments** – the Council could consider requiring Racial Equity and Social Justice (RESJ) assessments as a part of the development review process for data center projects to evaluate how data centers could impact neighborhood-level cumulative impacts (environmental and social stressors), County-level outcomes by race and ethnicity, and to develop an individualized, community-driven mitigation plan.
- **Non-Compliance Fines** – the Council could consider adopting a detailed and progressive fine structure for data centers that are not compliant with established codes and standards that goes towards a fund for mitigating negative RESJ impacts.
- **Decommissioning Plans** – the Council could consider requiring that data center applications include decommissioning plans that describe how the data center would be restored or adapted, both logistically and financially, at the end of its useful life.

Recommendation #2. When considering laws or zoning amendments for data centers or approvals for specific data center projects, the Council could require steps that solicit and incorporate feedback from affected community members, groups, and organizations.

When communities are genuinely involved from the start of a development process, agreements tend to include stronger, more specific, and better-enforced protections tailored to residents' concerns, rather than generic terms imposed after the fact. Early engagement also builds trust and reduces conflict if residents feel shut out of decisions affecting their neighborhoods.

The Council, in collaboration with Montgomery Planning, could require a minimum number of public community hearings as part of a data center approval process, with educational information provided well in advance of any hearing. Planners and data center developers could be required to engage in proactive outreach to community leaders, community groups, and residents of areas adjacent to the proposed site and to those impacted more broadly by utility rate increases, pollution, or resource use.

As recommended by RESJ advocates and organizers, the Council could also establish a Data Center Oversight Board to advise the Council on policies related to data centers and development applications for specific data center proposals; to monitor compliance with requirements for data center projects that are approved; and to ensure data center-related policies and projects align with RESJ.

Finally, OLO recommends that the Council (and County Executive) decline any requests to sign nondisclosure agreements with developers related to any development of data centers.

Recommendation #3. The Council could consider using tools such as Community Benefit Agreements (CBAs) to require data center entities to reduce negative impacts and create benefits for the community.

CBAs are legally binding contracts between a jurisdiction and an entity and allow governments to shape how an entity will operate in its jurisdictions. CBAs can decrease negative impacts associated with an entity's operation and create benefits for the community, such as dedicated funds for community improvements and local hiring preferences for jobs created by data center construction and operation.

Several communities across the U.S. have either passed or are considering CBAs for data center entities with various requirements that address impacts of data center operations and create tangible benefits for their community. Examples of some requirements developed by jurisdictions include:

- **Creating a fund, such as a community development or sustainable development fund, where data center entities agree to pay into.** St. Louis, MO requires the data center developer to contribute \$15 million to a fund dedicated for multi-modal transportation enhancements and economic and environmental justice activities.

- **Require data center entities to only use clean, renewable energy and place maximum daily withdrawals of water from municipal water sources.** Lancaster, PA restricts water usage to 20,000 gallons per day and requires data centers to use 100% renewable energy.
- **Require data centers to reduce noise and light pollution.** Lancaster, PA places requirements on data center entities to use low-noise chiller systems, noise restrictions on operations that cannot exceed existing nearby ambient noise levels, and lighting in accordance with principals of the International Dark Sky standards.
- **Require equity impact assessments of data centers.** The National NAACP developed a template for ensuring environmental justice considerations are built into CBAs which includes job and training requirements, environmental and climate disclosures, equity impact assessments, tenant protections, and dedicated funds for projects that benefit the community.

The Council could use these examples to develop CBAs that would best benefit the County and decrease any negative local impacts anticipated by data center construction and operations.

Recommendation #4. If the Council permits building of data centers in Montgomery County, it could work with the Executive Branch to ensure that County Government departments and other relevant entities have the legal authority, data infrastructure, and staff capacity to monitor and enforce requirements established for building and operating data centers.

As described above, the strength of the conditional use process lies in its administrative enforcement mechanisms. These mechanisms function well when the government is sufficiently equipped to monitor compliance. Clear legal authority to request operational data and conduct inspections, the technical tools to verify highly specialized conditions like energy consumption, water usage, noise levels, and emissions, and adequate staff capacity to track compliance over time all give the county confidence that approval conditions will be upheld throughout the life of a facility, not just at the point of initial approval. Ensuring this capacity strengthens the county's ability to ensure that data centers operate as promised, even as facilities scale up or change ownership over time.

Recommendation #5. The Council could encourage the Maryland General Assembly to amend state law to require all existing large load customers in the state register with and disclose information to the Public Service Commission.

The 2026 Utility RELIEF Act adopted by the Maryland General Assembly requires new “large load” utility customers that consistently have a high monthly demand for electricity register with the Maryland Public Service Commission (PSC). Large load customers are those with an aggregate monthly demand for electricity of 25 MW or more and include some large data centers.

The new reporting requirements include data such as ownership and location data, operations data, energy and water use data, and information on backup generation – the type of data that many stakeholders in communities with data centers do not have access to. These new reporting requirements, however, only apply to new large load customers or existing customers that cross the threshold to become large load customers. They do not apply to existing large load customers. Several data centers in Maryland currently meet the definition of a large load customer.

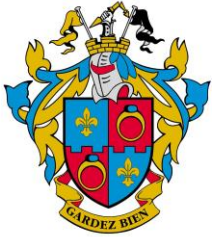
OLO recommends that the Council consider working with the Maryland General Assembly to bring existing large load customers under the PSC’s new registration and reporting authority.

Recommendation #6. The Council could assess whether data centers merit project-specific tax incentives or additional taxation. Emerging research shows that data centers can boost local employment, wages, and business formation, but they can also impose costs on third-parties: noise, visual, and environmental externalities; strain on local infrastructure and electricity systems; and, in some cases, reduced nearby home values.

Any assessment of tax incentives or additional taxes specific to data centers should weigh potential tax revenue gains against local costs and consider whether granting incentives would leave the County with enough fiscal capacity to address infrastructure, environmental, and other impacts.

Maryland exempts data centers from the state sales and use tax on qualified personal property (such as servers) if they locate or expand in the state and meet minimum investment and job-creation thresholds. State law also permits, but does not require, local governments to exempt or reduce county and municipal property tax on qualified data center personal property. Montgomery County has not adopted this local exemption.

Before adopting this authority or offering other project-specific tax incentives, the Council should first determine whether the resulting revenue loss would materially limit the County's ability to address data center-related externalities and meet broader service demands.



A Review of Information on the Impacts of Data Centers:

Appendix

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Appendix A. Jurisdictional Definitions of Data Centers

States and localities define data centers in statute in order to tax and regulate their zoning and use standards. The following table summarizes definitions used in the Washington metropolitan region.

Jurisdiction	Source	Data Center Definition
State of Maryland	MD Code Ann., Real Property § 14-134(A)(2) House Bill 1532 changed definition from Tax Code to Real Property Code	“Data center” means a building or group of buildings: I. “Used to house computer systems, computer storage equipment, and associated infrastructure that businesses or other organizations use to organize, process, store, and disseminate large amounts of data.” II. That has or is projected to have an aggregate demand of at least 5 megawatts; and III. That has or is projected to have a load factor of more than 80%.
Montgomery County, MD	Chapter 59 Zoning Ordinance, Section 3.5.2. Communication Facility Zoning code	No explicit definition in code. Data centers are considered a communications facility, which is allowed by conditional use in all zones in the County. Proposed Zoning Text Amendment 26-01 would define data centers in a manner similar to the State of Maryland. It would create a new land use category of data center and update the zoning code to only allow new data centers in industrial zones.
Prince George’s County, MD	Zoning Ordinance (Subtitle 27) – Definitions Zoning code	Uses State of Maryland definition in the tax code (I).
Frederick County, MD	§ 1-19-10.1100. CRITICAL DIGITAL INFRASTRUCTURE OVERLAY ZONE (CDI-OZ). Zoning code	Described under “Critical Digital Infrastructure Facility.” A facility consisting of one or more buildings used primarily for the storage, management, processing, and transmission of digital data, and which houses computer or network equipment, systems, servers, appliances, and other associated components related to digital data operations. The facility may also include customary accessory uses such as an office use, air handlers, power generators and storage, water cooling and storage facilities, and associated utility infrastructure needed to support sustained operations of the digital infrastructure.
District of Columbia	Title 11 – Zoning Subtitle B – Chapter 1 – Definitions Zoning code	Defined as a particular land use under Electronic Equipment Facility (EEF). A “facility or space used primarily for or intended to be used primarily for the housing, operation, and/or co-location of computer equipment that provides: (a) electronic data switching, (b) transmission, and/or (c) telecommunication functions, whether inside or outside the facility. The term EEF includes, but is not limited to, Data Center, Server Farm, Co-Location Facility, Telecommunications Switching Center, Tech Hotel, Telco Hotel, and Telecommunications Central Office.”

Jurisdiction	Source	Data Center Definition
State of Virginia	Virginia Code Subdivision A 43 of § 58.1-3506. Tax code	Defined as personal property. A “facility whose primary services are the storage, management, and processing of digital data and is used to house (i) computer and network systems, including associated components such as servers, network equipment and appliances, telecommunications, and data storage systems; (ii) systems for monitoring and managing infrastructure performance; (iii) equipment used for the transformation, transmission, distribution, or management of at least one megawatt of capacity of electrical power and cooling, including substations, uninterruptible power supply systems, all electrical plant equipment, and associated air handlers; (iv) Internet-related equipment and services; (v) data communications connections; (vi) environmental controls; (vii) fire protection systems; and (viii) security systems and services.”
Fairfax County, VA	Fairfax County Zoning Ordinance Article 9 > 9103. > Industrial Uses Zoning code	“A facility containing one or more large-scale computer systems used for data storage and processing for off-site users. Typical supporting equipment includes back-up batteries and power generators, cooling units, fire suppression systems, and enhanced security features.”
Loudoun County, VA	Zoning Ordinance Chapter 4: Use-Specific Standards > 4.06.02 Data Centers Zoning code	“An establishment engaging in the storage, management, processing, and/or transmission of digital data, and housing computer and/or network equipment, systems, servers, appliances, and other associated components related to digital data operations.”
Prince William County, VA	Part 509. - Data Center Opportunity Zone Overlay District Zoning code	“A use involving a building or premise in which the majority of the use is occupied by computers and/or telecommunications and related equipment, including supporting equipment, where information is processed, transferred and/or stored.”

Appendix B. Status of Data Center Regulations in the Washington Metropolitan Area

In May 2026, the Metropolitan Washington Council of Governments published a table which summarized the current status of regulation for jurisdictions where data center development is an active policy question. The table is reproduced below.

Jurisdiction	Status	Review Path	Locational Strategy	What It Shows
Fairfax County, VA	Adopted	Mix of by-right and Special Exception review, with heightened scrutiny for larger or sensitive locations	Permitted in industrial and selected commercial districts, with exclusions near Metro stations	A zoning framework strengthened through amendments, adding large residential setbacks (200–300 ft), mandatory noise studies, and heightened scrutiny near Metro stations.
Loudoun County, VA	Under Revision	Special Exception required for all new data centers; by-right approvals eliminated	Concentrated in industrial areas identified in the General Plan	Recalibrating from a permissive legacy model to fully discretionary review; Phase 2 is addressing noise, energy, substations, and building height.
Prince William County, VA	Ongoing Review	Overlay district governs most projects; larger campuses may also require rezoning or Special Exception	Growth directed to infrastructure-served areas through an overlay	An overlay-based framework using public transparency tools — including an interactive project-tracking map — to manage rapid growth and cumulative impacts across a large geographic area.
Frederick County, MD	Adopted	Floating overlay with rezoning required outside mapped areas	Growth limited to a defined area, capped at around 1% of county land	A concentration-and-limits model combining a defined around 2,600-acre growth area, large residential setbacks (500 ft), and agricultural land preservation requirements.
Montgomery County, MD	Under Revision	Proposed shift to conditional use approval in industrial zones only	Proposed clustering near Airpark, Shady Grove, and Dickerson areas	Redefining data centers as a distinct use, with proposed restrictions to industrial zones and new environmental and compatibility standards.
Prince George's County, MD	Ongoing Review	Existing framework under reconsideration; task force recommends discretionary approval	Recommended restriction to non-residential, non-sensitive areas	A policy reassessment triggered by public controversy, resulting in task force recommendations for Special Exception review, community benefits agreements, and stricter environmental standards.

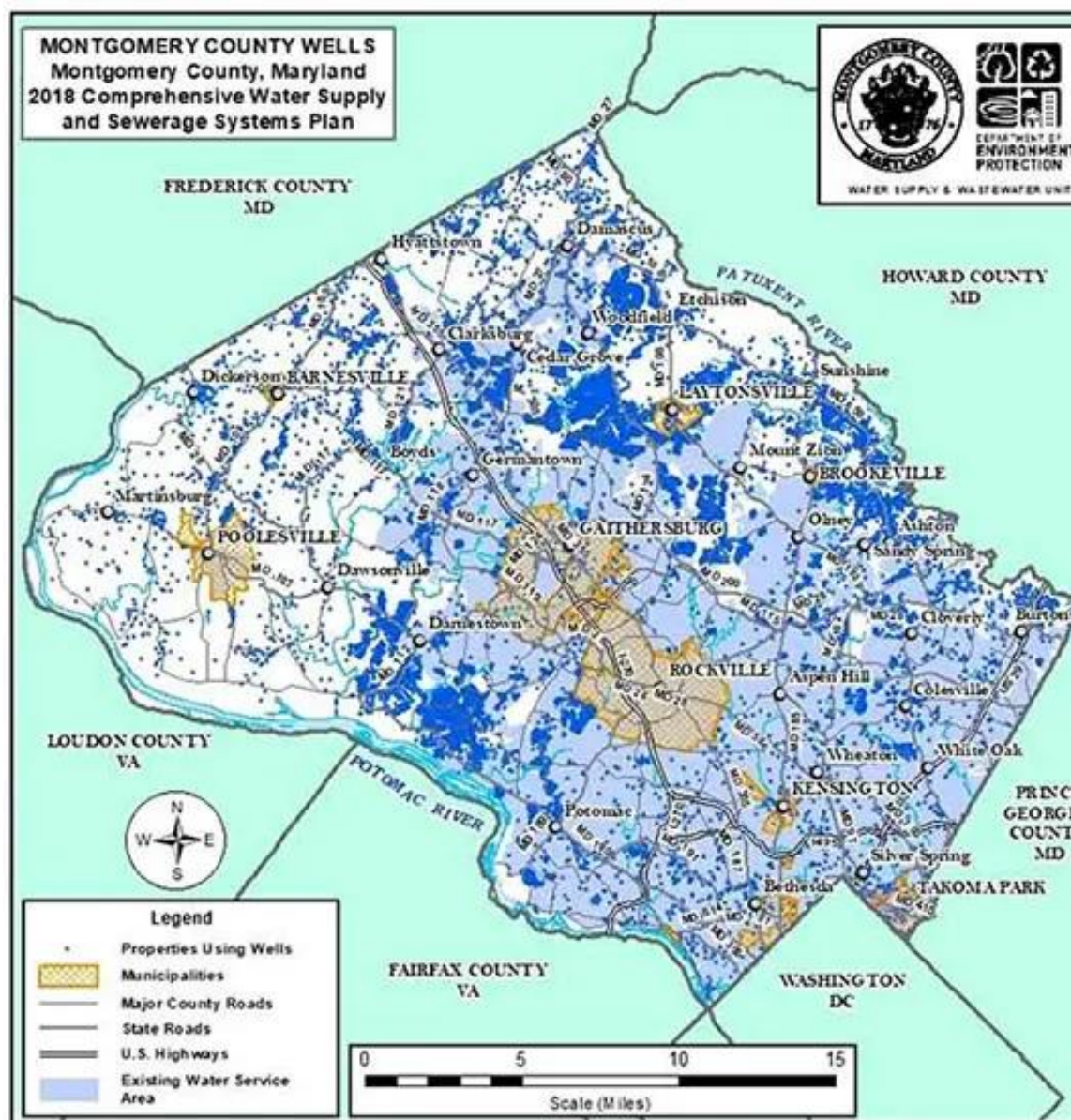
Source: Metropolitan Washington Council of Governments, [Land Use and Economics Primer](#), May 2026.

Appendix C. PJM 10-Year Net Energy Forecast by Utility, 2026

Utility	Net energy load annual growth rate	Summer peak load annual growth rate	Winter peak load annual growth rate
AE	0.40%	0.10%	0.60%
BGE	1.20%	0.40%	0.60%
DPL	0.10%	0.00%	0.10%
JCPL	2.30%	1.00%	2.10%
METED	2.50%	1.60%	1.90%
PECO	3.60%	1.80%	2.60%
PENLC	0.50%	0.10%	0.20%
PEPCO	3.30%	2.00%	2.10%
PL	8.80%	6.40%	6.50%
PS	4.50%	2.40%	3.90%
RECO	0.70%	-0.20%	1.00%
UGI	0.20%	-0.10%	0.00%
AEP	7.00%	5.30%	5.60%
APS	4.30%	2.90%	3.00%
ATSI	2.90%	1.70%	2.30%
COMED	6.80%	3.90%	5.60%
DAYTON	7.80%	5.20%	5.80%
DEOK	0.90%	0.60%	0.60%
DLCO	1.20%	0.60%	1.00%
EKPC	0.80%	0.40%	0.20%
OVEC	0.00%	0.00%	0.00%
DOM	7.20%	5.40%	5.10%
PJM RTO	5.30%	3.60%	4.00%

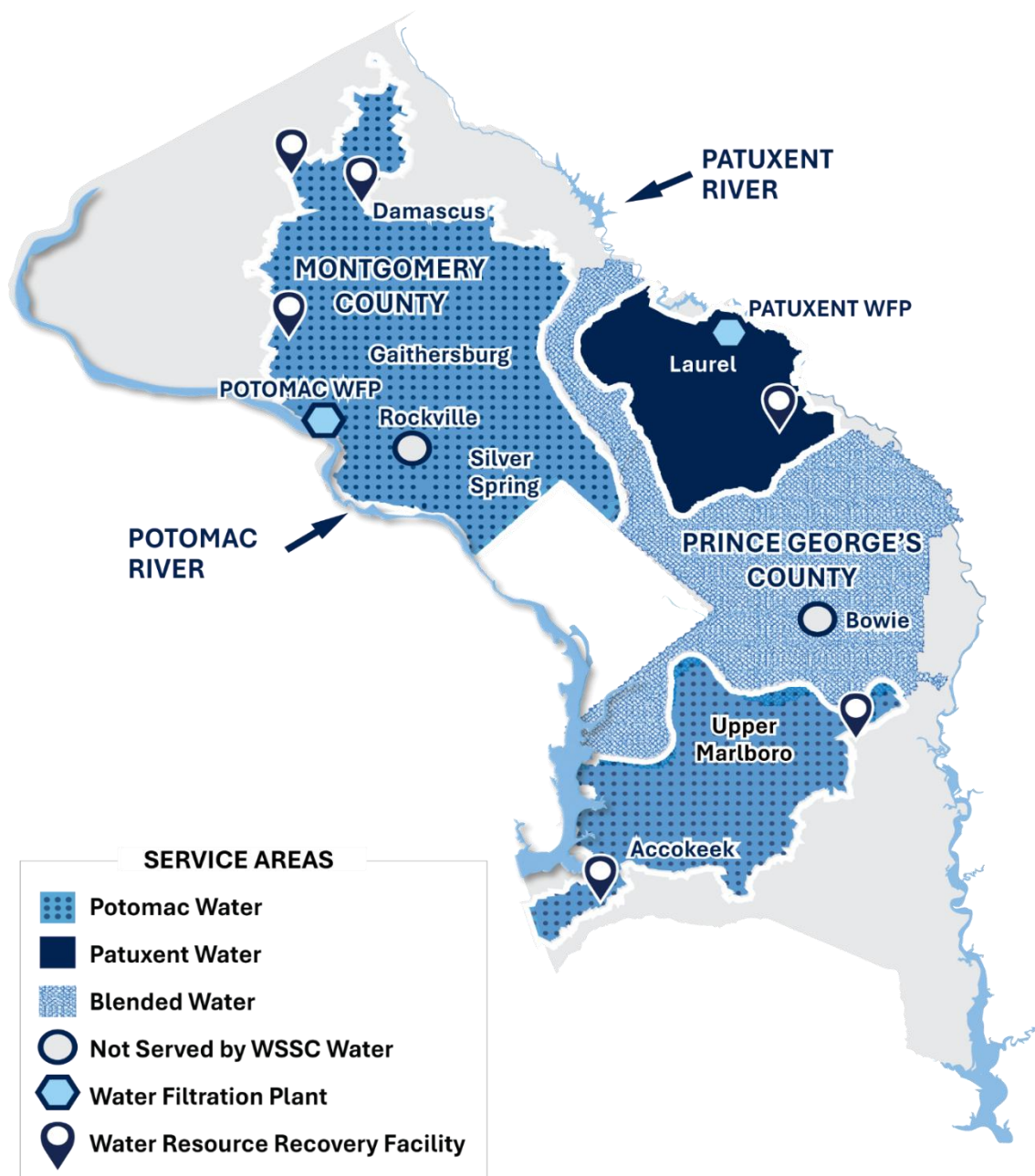
Sources: PJM, '[2026 Load Forecast Tables](#),' Table E-1. Annual Net Energy (GWh) and Growth Rates for Each PJM Zone and Geographic Region (2026 - 2046); Table B-1. Summer Peak Load (MW) and Growth Rates for Each PJM Zone and Geographic Region (2026 - 2046); and Table B-2. Winter Peak Load (MW) and Growth Rates for Each PJM Zone and Geographic Region (2025/26 - 2045/46).

Appendix D. Location of Montgomery County Wells



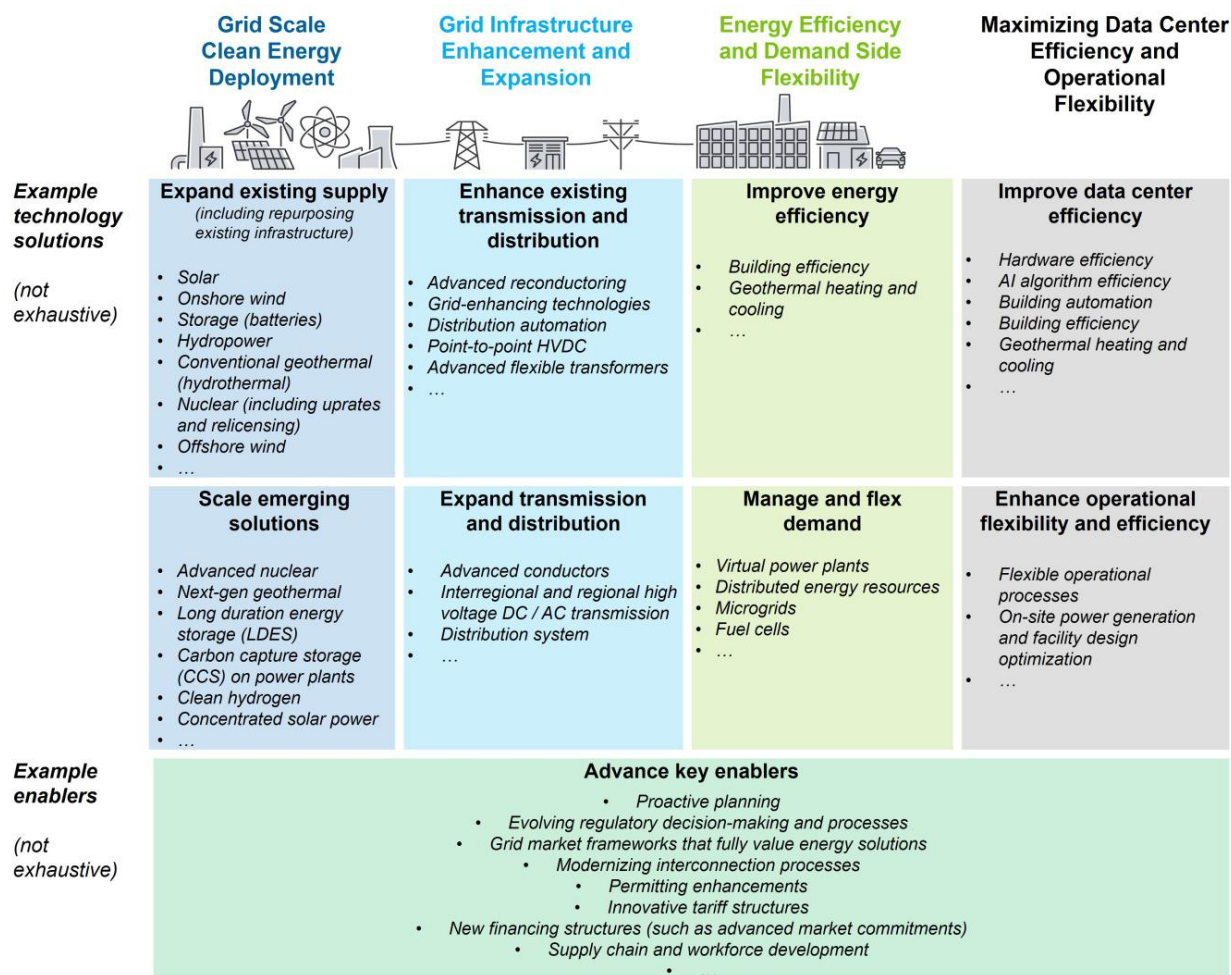
Source: Montgomery County Department of Environmental Protection, [Water Supply Wells](#).

Appendix E. WSSC Water Service Areas



Source: WSSC Water, [Where Does My Water Come From?](#).

Appendix F. Department of Energy Recommendations for Increasing Clean Energy Deployment and Data Center Efficiency



Source: U.S. Department of Energy, [Clean Energy Resources to Meet Data Center Electricity Demand](#).

Appendix G. Community Benefits Agreement Summary between Lancaster, PA and Owners of the Lancaster AI Hub

The Owners of the Lancaster AI Hub commit to designing, building, and operating the campuses in ways that protect nearby neighborhoods, safeguard the environment, and provide meaningful community benefits.

Environmental & Operational Performance Commitments

Noise

- Operations cannot exceed existing ambient noise levels at nearby homes and parks.
- Testing will occur before and after sites become operational.
- Campuses will use low-noise chiller systems and sound-attenuated generator enclosures.
- Generator testing occurs only during daytime hours, never on Sundays or federal holidays.

Air Quality

- Full compliance with all state and federal air-emission regulations.
- Backup generators must use advanced emission-control systems.

Energy

- All data center buildings will use 100% clean-energy electricity.
- Owners may enter into long-term energy contracts that fall below 100%, only if they make significant contributions into the City's Sustainable Development and Clean Energy Fund.

Water & Wastewater

- Water use is capped at 20,000 gallons per day per campus, significantly less than the use for typical manufacturing. For context, the previous user consumed on average 100,000-125,000 gallons per day.
- Closed-loop cooling must minimize municipal water use with no added chemicals. -Wastewater generation must stay within permitted sewer capacity.

Site Design & Construction Standards

Landscaping, Buffers & Lighting

- Each campus must have a professionally designed landscape plan; tree canopy and vegetative screening are required.
- Buffers: 100 feet along public streets and residential or park edges; 50 feet along all other boundaries.
- All lighting must be in accordance with the principals of the International Dark Sky standards to limit glare and spillover.

Equipment Screening & Building Design

- Cooling systems, generators, and electrical equipment must be fully enclosed or visually screened.

Climate & Resiliency

- Plans must address waste-heat reuse, heat-island reduction, stormwater management, and healthy building strategies.

Operational Responsibilities

Emergency Management

- Owners must prepare emergency response plans, provide ongoing training for first responders at no cost and reimburse the City for emergency response costs above \$25,000 per incident.

E-Waste & Decommissioning

- A comprehensive e-waste plan must manage equipment throughout the project's life cycle.
- Decommissioned buildings must be safely cleared and closed in compliance with law.

Community Engagement & Workforce Commitments

Transparency & Communication

- Owners must maintain a public website with project updates, timelines, permits, and a portal for questions or complaints.
- Each April, Owners must present a public report to City Council on clean-energy usage for each building, and compliance with clean-energy requirements.
- A formal complaint-response process will be established in consultation with the City.

Local Hiring

- Owners commit to strong local hiring efforts for both construction and permanent jobs.
- A Local Hiring Plan will outline percentage goals and engagement strategies such as job fairs and community outreach.

Financial Contributions

The owners will contribute \$10 million each to two funds:

1. Economic Development Fund, intended to promote the economic vitality of Lancaster City and foster the economic mobility and success of Lancaster City residents. The Lancaster Economic Development Company (EDC) will play a formal role in developing a strategy and administering the deployment of monies, which will be managed by the Lancaster County Community Foundation.

2. Sustainable Development and Clean Energy Fund, managed by the City of Lancaster, whose purpose is to advance environmental sustainability in the City of Lancaster and will draw guidance from the City’s Climate Action Plan, Comprehensive Plan, and other related initiatives.

Payments in increments of 2.5 million dollars will be made into each fund at the time of construction financing and on a date within 30 days of beginning data center operations. The payment allocation will be phased per building as the Lancaster AI Hub develops.

Upon approval of the CBA, the Owners will make a partial payment of the first contribution in the amount of \$250,000 to fund the creation of a strategic plan for use of the Economic Development Fund monies.

Enforcement & Accountability

Default & Remedies for Failure to Comply with Non-Financial Commitments:

- After notice and an opportunity to cure (30-60 days), the City may pursue injunctions or orders requiring compliance with a commitment or other relief, including discontinuance of operations (this is the strongest remedy available).
- When a property is sold, the new owner must assume all obligations under the agreement.

Ensuring Payments are Made

If the owners miss a required payment, the City can:

- Seek payment through the courts; or
- Draw money directly from the Letter of Credit or other financial security. Missed payments may incur interest from the due date until paid.

Other

Chirisa Technology Parks and its affiliates are not receiving any tax breaks from the City of Lancaster, including Local Economic Revitalization Tax Assistance (LERTA).

Source: City of Lancaster, [Community Benefits Agreement Summary](#), November 2025. The full community benefits agreement [can be found here](#).

Appendix H. Summary of CBA and Conditional Use Provisions between City of St. Louis and Developers of the Armory Innovation Data Center

CBA Provision	Key Terms	Importance
No Local Incentives	The Developer will not seek local tax abatement or other financial incentives for the data center or Armory buildings. The Developer will cooperate with the termination of the Armory Tax Increment Financing (TIF) and allow surplus funds to be returned to taxing districts.	This ensures the City and local taxing districts immediately benefit from new property tax revenues generated by the project, as public subsidies are forgone for the primary development components.
Tax Revenue & Job Requirements	The Developer must confirm tax revenue estimates and pay \$15,000 in liquidated damages for every \$100,000 below the projected annual tax revenues if not met by 2029. The Developer must meet escalating, median-wage "Job" minimums for 20 years (starting at 25 in year 1, 50 in year 2, and 100 thereafter) and pay \$2,000 in liquidated damages for each job short of the required total. The Developer and large tenants must comply with the City's First-Source hiring ordinance to prioritize City residents for entry-level jobs.	These clauses are critical enforcement tools to guarantee the project delivers on its promise of generating significant new tax revenue and high-quality, full-time equivalent jobs for the community over the long term. If targets are not met, there are financial penalties. First-Source hiring ensures local residents benefit from new employment opportunities.
Other Community Benefits (Financial)	The Developer will contribute \$30 per square foot of approved data center development, an estimated \$15,750,000, to a Fund. The funds are for the City's use on (a) multi-modal enhancements (e.g., Brickline Greenway), (b) St. Louis Digital Access Inclusion Plan activities (e.g., expanding public wifi across the city), and (c) economic and environmental justice activities, including grants for local distributed energy and weatherization, and job retraining for anticipated data center/A.I. impacts.	This creates a substantial, dedicated funding source for the City to proactively address infrastructure improvements, digital equity, and climate goals, mitigating local impacts of the development while advancing broader community initiatives.
Utilities and Environment	The Developer must use reasonable efforts to source at least 50% of the data center's energy load from renewable sources (wind, solar, geothermal, etc.) within five years of commencing operations. If the renewable goal is not met, the Developer must endeavor to purchase localized renewable energy credits. The Developer must also recycle e-waste. The Developer must annually report electricity usage, waste heat, and water usage, which may be made public.	This ensures the energy-intensive data center commits to sustainability, helping the City meet its climate goals and reduce e-waste. Annual reporting promotes transparency and allows the public to monitor the project's environmental footprint.

CBA Provision	Key Terms	Importance
Equal Opportunity & Non-Discrimination	The Developer and its contractors must comply with all federal, state, and local Nondiscrimination Laws, as well as specific City ordinances pertaining to minority-owned and women-owned business (M/WBE) participation, workforce development, and prevailing wage compliance. Covenants will run with the land to prohibit discrimination in the sale, lease, or use of the property.	These requirements ensure that the economic opportunities created by the construction and operation are inclusive and non-discriminatory, supporting equity goals for contracting and workforce diversity.
Project Construction & Design	Establishes a performance schedule, with the data center completely operational by the end of Q4 2028. Permits will not be issued until all Green Street properties are current on taxes. The Developer must install and maintain sidewalks adjacent to Market Street and a pedestrian pathway to the Grand Metrolink station. The 500 Prospect property must conform to mutually agreeable plans for pedestrian, stormwater management, and heat island mitigation enhancements if used for parking.	The schedule ensures timely completion. Infrastructure requirements enhance pedestrian safety and connectivity to public transit. The mitigation requirements ensure the development minimizes negative environmental impacts on the immediate area.
Miscellaneous Restrictions	The Developer must file a decommissioning plan to safely remove and recycle electronic waste if the data center is vacant for over a year. The Developer must not lease the data center to tenants primarily using the premises for crypto-mining or other undesirable business uses. Public disclosure of tenants must be provided unless commercially unreasonable due to national security interests.	These provisions protect the City from potential negative externalities, such as environmental hazards from e-waste or undesirable, high-energy-consuming business uses like crypto-mining. Tenant disclosure promotes transparency.

Source: Adapted from City of St. Louis, [Armory Innovation Data Center Project: Summary of CBA Provisions](#), April 2026.

Conditional Use Category	Key Provisions (Requirements Upon Data Center)	Importance and Rationale
Waste Management and Recycling	Petitioner must maintain clean premises with a commercial dumpster and private trash contract. All electronic waste must be disposed of using an active R2-certified (Responsible Recycling) contractor for the duration of operation, with annual proof provided to the Zoning Administrator.	Ensures premises cleanliness. Critically, it mandates the environmentally appropriate and accountable disposal of hazardous electronic waste (e-waste) by a certified contractor throughout the facility's lifespan.
Signage	All signage must be professionally prepared, permitted by the City of St. Louis Building Division, and approved by the Zoning Administrator. Temporary signage is prohibited on the premises, windows, or doors.	Maintains visual quality, prevents blight, and ensures all installations adhere to city codes and aesthetic standards.
Safety	Install and maintain an operable 24-hour security lighting system for the perimeter and interior. The premises must not be issued a public nuisance notice.	Ensures security for the property and surrounding area. Holds the operator accountable for maintaining good premises conditions, preventing negative impacts on the neighborhood.
Noise and Vibration Controls, Reporting	Abide by the City of St. Louis Noise Ordinance. Requires an annual third-party report of noise emissions taken at all adjoining parcel lines, submitted to the Health Director/Commissioner and Zoning Administrator.	Directly addresses noise pollution, a primary concern with mechanical-heavy operations. Annual, objective testing verifies continuous compliance with city standards and allows for the assessment of mitigation strategies.
Building Design & Equipment Screening	Requires architectural metal screening at the roofline. Noise-emitting equipment must be fully enclosed within acoustically treated structures, placed away from frontages, and screened by opaque fencing and landscaping. Must include a Cool Roof, Green Roof, and/or rooftop solar to reduce urban heat. A minimum of 30% of the non-building lot area must be landscaping or permeable surface for urban heat mitigation and stormwater management. Outdoor lights must be shielded and directed downward. As practicable, all outdoor lighting shall meet the standards of the Dark Sky Initiative or other Bird City recommendations.	Mitigates visual pollution from machinery. Acoustical enclosures minimize noise impact. Green infrastructure combats the urban heat island effect and improves stormwater runoff. Shielded lighting prevents light pollution.
Water Responsibility	Must use a closed loop system and air-cooled chillers to minimize water consumption. Prior to building permit issuance, Petitioner must enter a written agreement with the St. Louis City Water Division to fund all required fees, system impact fees, and costs for a hydraulic model study and rectifying any detrimental impact on existing customers. Ongoing compliance with Metropolitan St. Louis Sewer District wastewater discharge standards is required. Prior to a cost of service study's completion, an agreement may establish a short-term rate for this use.	Addresses the data center's typically massive water demand by requiring water-efficient cooling systems. Ensures the Petitioner bears the full financial cost of the impact on public water infrastructure, protecting existing customers from service disruption or added financial burden.

Conditional Use Category	Key Provisions (Requirements Upon Data Center)	Importance and Rationale
Backup Generators	Generators shall never be used as a general operating power source. Diesel generators must utilize the cleanest certified emissions tier (Tier 4 certification). Testing is strictly limited to weekdays between 10:00 AM–12:00 PM and 2:00 PM–5:00 PM. Incorporate battery storage for backup power to minimize reliance on diesel generators. No testing of backup generators on bad air quality days.	Prevents the facility from running on on-site generator power, other than as a backup source during a power outage. Mandating Tier 4 certification minimizes air pollution from generators when they are tested or if they are ever needed during a power outage. Restricting testing hours minimizes noise disturbance for adjacent properties and residents.
Energy, Efficiency & Infrastructure Standards	Maintain a Power Usage Effectiveness (PUE) of 1.25 or better (1.35 if repurposing existing building), with an annual report. Must pursue LEED certification or a similar green building program. Annually report waste heat rejected and recovered to assess urban heat impacts. Petitioner must fund any project-specific additional electrical infrastructure. Achieve at least 50% of the energy load from renewable sources within five years (or purchase localized RECs). Additional targets may be set in a CBA.	Ensures the data center operates at a high level of energy efficiency, reducing overall power demand and carbon footprint. Mandating funding for new electrical infrastructure prevents the public from subsidizing the facility's infrastructure needs. The renewable energy goal drives sustainability and green operations.
Further Commitments and Community Benefits	Petitioner must enter into a recorded Community Benefits Agreement (CBA) with the LCRA or another acceptable entity. The CBA must document agreements to further mitigate impacts, improve the surrounding area, and benefit the community.	Formalizes the Petitioner's commitment to the community beyond what can be addressed through a zoning approval. Recording the CBA in the land records ensures the commitments are legally binding for the property's duration.

Source: Adapted from City of St. Louis, [Armory Innovation Data Center Project: Summary of Conditional Use Provisions](#), April 2026.

Appendix I. Comparison of Tools for MDEJSCREENV3.3 and MDEnviroScreen

The Center for Engagement, Environmental Justice and Health (CEEJH)

A guide from CEEJH that compares indicators included in MDEJSCREENV3.3 and MDEnviroScreen. Of note, while MDEJSCREENV3.3 includes measures of race and ethnicity in its EJ score, MDEnviroScreen does not. Under population characteristics, MDEJSCREENV3.3 EJ Score includes the Social Vulnerability Index (SVI), which measures BIPOC representation, among other characteristics. For more info on SVI, refer to [“Social Vulnerability Index,”](#) Geospatial Research, Analysis, and Services Program, Center for Disease Control, July 22, 2024.



Comparison of Tools for MDEJSCREENV3.3 and MDEnviroScreen

Number	Category of Tool Characteristics	Details of Tool Characteristics	Subcategory Details of Tool Characteristics	Mapping Tool	
				MDEJSCREENV3.3	MDEnviroScreen
1	Domain Indicators	Health	Asthma	Yes	Yes
2			Chronic Heart Disease	Yes	No
3			COPD	Yes	No
4			Male Preventative Care	Yes	No
5			Female Preventative Care	Yes	No
6			Smoking	Yes	No
7			Diabetes	Yes	No
8			High Cholesterol	Yes	No
9			Kidney Disease	Yes	No
10			Mental Health Incidence	Yes	No
11			Obesity	Yes	No
12			Stroke	Yes	No
13			Depression	Yes	No
14			Low birth weight	No	Yes
15		Environmental Effects	Proximity to Chemical, Plastic, Petroleum, Rubber Plants	Yes	Yes
16			Proximity to Brownfields	Yes	Yes
17			Proximity to Waste Water Facilities	Yes	No
18			Proximity to CAFOs	Yes	Yes
19			CAFO Indicator	No	Yes
20			Proximity to Mines	Yes	No

21		Proximity to Incinerators	Yes	No
22		Proximity to Power Plants	Yes	Yes
23		Proximity to Hazardous Waste Sites	Yes	Yes
24		Proximity to Solid Waste Facilities	Yes	No
25		Proximity to Hazardous Landfill	No	Yes
26		Proximity to Open USTs	Yes	No
27		Superfund Sites	No	Yes
28		Proximity to Risk Management	No	Yes
29	Population Characteristics	Food Desert	Yes	No
30		Proximity to Fire Stations	Yes	No
31		Proximity to Police Station	Yes	No
32		Proximity to Hospitals	Yes	No
33		GINI Index	Yes	No
34		Housing	Yes	No
35		Internet Access	Yes	Yes
36		Under/No Insurance	Yes	No
37		SNAP Recipients	Yes	No
38		Energy Burden	Yes	No
39		Linguistic Isolation	Yes	No
40		SVI	Yes	No
41		Lead Paint Housing	Yes	Yes
42		Unemployment	Yes	No
43		Low income	No	Yes
44		Income less than or equal to 80% MD Median	No	Yes
45		Child Poverty	No	Yes
46		25+ with no Highschool Diploma	Yes	No
47		AQI	Yes	No
48		NO2	Yes	No
49	Environmental Exposure	Traffic Proximity	Yes	Yes
50		Surface Water Nitrate Violation	Yes	Yes
51		Ground Water Nitrate Violation	Yes	No
52		Wastewater Discharge	No	Yes

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53			Leaky Storage Tanks	Yes	No
54			Diesel	Yes	Yes
55			Manure Use	Yes	Yes
56			Ozone	No	Yes
57			AirToxScreen Cancer Risk	No	Yes
58			AirToxScreen Respiratory Index Risk	No	Yes
59			PM2.5	Yes	Yes
60		Climate Change	Tree Coverage	Yes	Yes
61			National Risk Index	Yes	No
62			Heat Index	Yes	No
63			Community Impact Score	No	Yes
64			Community Vulnerability Score	No	Yes
65			Climate Exposure Score	No	Yes
66			Drought	No	Yes
67			Urban Heat Island	No	Yes
68			Flooding and Storm Surge	No	Yes
69		Housing	Vacant Housing Units	No	No
70			Severe Housing Cost Burden (Renters)	No	No
71			Severe Housing Cost Burden (Owners)	No	No
72			Racially or Ethnically Concentrated Area of Poverty (R/ECAP)	No	No
73			Owner-Occupied Housing Units)	No	No
74			Imprisonment Rate	No	No
75			History of Redlining	No	No
76	Context Layer Indicators	Population Characteristics	Urban Area	Yes	No
77			Rural Area	Yes	No
78		Climate Change	Population	Yes	No
79			Flood Plain	Yes	No
80			% of People living below the federal minimum income	Yes	No
81			% NonWhite Population	Yes	No
82			% White, Non-Hispanic Population	Yes	No
83			% Canopy Coverage	Yes	No

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84			Risk Value	Yes	No
85			House Legislative Districts (2022) - MDEJSCREENV3.2 EJ Score (Crude Values)	Yes	No
86			Senate Legislative Districts (2022) - MDEJSCREENV3.2 EJ Score (Crude Values)	Yes	No
87			House Legislative Districts (2022) - MDEnviroScreen EJ Score (Crude Values)	Yes	No
88			Senate Legislative Districts (2022) - MDEnviroScreen EJ Score (Crude Values)	Yes	No
89			House Legislative Districts (2022) - Permitted Facilities under Clean Air Act	Yes	No
90			House Legislative Districts (2022) - Permitted Facilities (Air, Land, Water)	Yes	No
91			House Legislative Districts (2022) - TRI Emissions (in pounds)	Yes	No
92			House Legislative Districts (2022) - RSEI Score	Yes	No
93			House Legislative Districts (2022) - Surface Water (Industrial)	Yes	No
94			House Legislative Districts (2022) - Surface Water (Municipal)	Yes	No
95			House Legislative Districts (2022) - Ground Water (Industrial)	Yes	No
96			House Legislative Districts (2022) - Ground Water (Municipal)	Yes	No
97			Senate Legislative Districts (2022) - Permitted Facilities under Clean Air Act -	Yes	No
98			Senate Legislative Districts (2022) - Permitted Facilities (Air, Land, Water)	Yes	No
99			Senate Legislative Districts (2022) - RSEI Score	Yes	No
100			Senate Legislative Districts (2022) - TRI Emissions (in pounds)	Yes	No

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101			Senate Legislative Districts (2022) - Surface Water (Industrial)	Yes	No
102			Senate Legislative Districts (2022) - Surface Water (Municipal)	Yes	No
103			Senate Legislative Districts (2022) - Ground Water (Industrial)	Yes	No
104			Senate Legislative Districts (2022) - Ground Water (Municipal)	Yes	No
105			EPA Community Water System Service Area Boundaries	Yes	No
106			EPA IRA Disadvantaged Communities (2025)	Yes	No
107			WSA Violations in 2025 (Location)	Yes	No
108			WSA Violations in 2025 (Count of Violations by County)	Yes	No
109			EPA Water ICAT – Community Water Systems as Points (January 15 2026)	Yes	No
110			EPA Water ICAT – Community Water Systems with Boundaries (January 15 2026)	Yes	No
111			EPA Water ICAT – Publicly Owned Treatment Works (January 15 2026)	Yes	No
112			EPA Discharge Monitoring Reports for PFAS (2025) - Facilities with Facility and Permit Data	Yes	No
113			Segregation/Integration	Yes	No
114			Divergence Index	Yes	No
115			Neighborhood Income Ratio	Yes	No
116			Entropy Score	Yes	No

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Appendix J. Frederick County, MD Data Center Ordinance

§ 1-19-8.402. CRITICAL DIGITAL INFRASTRUCTURE FACILITIES.

The following provisions apply to critical digital infrastructure facilities.

(A) *Purpose and intent.*

(1) The critical digital infrastructure use is established to provide a location for facilities consisting of one or more buildings used primarily for the storage, management, processing, and transmission of digital data, which houses computer and/or network equipment, systems, servers, appliances, and other associated components related to digital data operations.

(B) *Size and location.*

(1) Critical digital infrastructure use may be established only where:

(a) The tract of land where the critical digital infrastructure use is proposed has a zoning designation of Limited Industrial (LI) or General Industrial (GI);

(b) The tract of land where the Critical Digital Infrastructure use is proposed is within the Critical Digital Infrastructure Overlay Zone (CDI-OZ); and

(c) Critical digital infrastructure may only be established on a tract of land that abuts land that is zoned residential or is designated residential on the Comprehensive Plan Land Use map if the front, side, and rear yard setbacks set forth in § 1-19-6.100 for a critical digital infrastructure facility are increased to 500 feet from any property line abutting such residentially zoned or designated land.

(2) The tract of land proposed to be utilized for a critical digital infrastructure use may not be located within a priority preservation area (PPA), a rural legacy area (RLA), or a treasured landscape management area.

(3) The tract of land proposed to be utilized for a critical digital infrastructure use may not have a designation of no planned service (NPS) in the Frederick County Water and Sewerage Plan.

(4) *Additional size and location criteria.* Applicants must demonstrate that:

(a) The visual impact of the project on the viewshed, surrounding properties, public roadways, including roadways with rustic, scenic, or historic designation, and historic sites will be avoided or minimized to the maximum extent practicable;

(b) Schools, college and universities, daycare centers, health care facilities, houses of worship, residences, and other non-industrial uses in the vicinity have been identified and negative impacts to these uses will be avoided or minimized to the maximum extent practicable;

(c) Fragile ecosystems and watersheds in the vicinity have been identified, and negative impacts will be avoided or minimized to the maximum extent practicable;

(d) Negative impacts to local, state, and federal recreational amenities and private parks, as defined in § 1-19-11.100, will be avoided or minimized to the maximum extent practicable; and

(e) The siting of the proposed use(s) will not have a negative impact that disproportionately affects overburdened communities or underserved communities as those terms are defined in Md. Code Ann., Environmental Article, § 1-701.

(C) *Bulk regulations.*

(1) The Planning Commission may approve a reduction to, but not elimination of, the required yard setbacks in § 1-19-6.100 between adjoining critical digital infrastructure facilities during the site plan review process, if the Planning Commission finds that reducing the setbacks:

- (a) Increases the size and usability of open space areas;
- (b) Increases the landscape buffer areas along other adjacent property lines with different land uses;
- (c) Provides additional buffer areas for environmentally sensitive areas or resources; or
- (d) Facilitates compliance with the design criteria listed under § 1-19-8.402(B).

(2) Notwithstanding any reduction approved by the Planning Commission, the distance between structures must comply with applicable building code requirements.

(D) *Design requirements.*

(1) Buildings must be predominantly designed and constructed to include finishes and materials of consistent quality and design on all sides. All building facades that are in public view must avoid the use of undifferentiated facades and long, plain wall sections by including a combination of the following design elements: change in building height, building step-backs or recesses, windows, doors, changes in building material, patterns, textures, colors, or use of accent materials. Architectural renderings or plans must be submitted as part of the site development plan application for approval by staff and the Planning Commission to assure that the appearance, type of building materials, or other aspects of the building are consistent with the purposes and intent of the critical digital infrastructure design requirements.

(2) Visual impacts of the critical digital infrastructure on designated preservation areas, such as rural legacy areas, agricultural preservation areas, critical farms, Monocacy scenic river, designated heritage areas, historic sites, and sites eligible for historic designation, must be avoided or minimized to the maximum extent practicable. A viewshed analysis must be submitted as part of the site development plan application for approval by staff and the Planning Commission to assure that visual impacts are avoided or minimized to the maximum extent practicable through such means as building placement, building materials, landscaping, and screening.

(3) Building entrances must be designed and oriented in terms of their relationship to the human scale and must reflect this relationship through the inclusion of human-scaled architectural elements.

(4) Refuse and recycling dumpsters, service doors, and mechanical equipment must face away from roadways, pedestrian routes, and public areas.

(5) In order to minimize visibility from adjacent roads and adjacent properties, ground level and roof top mechanical and electrical equipment, power generators, water cooling and storage facilities, utility substations, and other associated utility infrastructure to support sustained operations of the infrastructure must be screened. This screening may be provided by a principal building. Mechanical and electrical equipment not screened by a principal building must be screened by a visually opaque fence, screen wall or panel, parapet wall, or other visually opaque screen that must be constructed of materials compatible with those used in the exterior architectural finishes of the principal building.

(6) Staff shall refer site plans to the Architectural Review Committee, if the committee exists in good standing, for review prior to the site plan being scheduled for Planning Commission. The recommendations of the Architectural Review Committee may be considered by the Planning Commission.

(7) In addition to meeting the requirements of § 1-19-6.400, the following landscaping, screening, and buffering requirements must be met.

- (a) Front yard(s) abutting a roadway must include a landscaped buffer.
- (b) Except where adjoining a critical digital infrastructure use, side and rear yards must include a landscaped buffer.

(c) A landscaped buffer must include a four-season visual screen resulting in multi-layered, staggered rows of overstory and understory trees and shrubs that are a mix of evergreen and deciduous vegetation, with an emphasis on species that are native to Frederick County.

(d) The minimum height of overstory trees within a landscape screen or buffer at planting must be a minimum of 6 feet with a minimum caliper of 2 inches. The minimum height of understory trees and shrubs at the time of planting must be 3 gallon or larger. Trees and shrubs larger than the minimum sizes listed above will be required where the minimum planting sizes will not provide adequate screening or buffering within 2 years. Vegetation used to establish a visual screen shall not be trimmed so as to stunt upward and outward growth or to otherwise limit the effectiveness of the visual screen.

(e) A berm, wall, or fence may be used in combination with vegetation to satisfy the screening requirement where deemed appropriate by County Staff and the Planning Commission. Walls and fences must be made of quality materials and enhance rather than detract from the beautification of the site. Walls and fences that are in public view must avoid long, undifferentiated facades and long, plain sections by including a combination of the following design elements: variations in height, step-backs or recesses, changes in material, patterns, textures, colors, or use of accent materials.

(f) If security fencing is proposed, vegetative screening must be placed between the fence and the public view. Fencing must be made of high quality materials. Chain-link and similar woven metal or plastic fencing shall not be used.

(g) If forest or hedgerows exist where screening or buffering is required, it must be preserved to the maximum extent practicable and supplemented with new plantings where necessary to provide the desired screening or buffering.

(h) All landscaping, screening, and buffering must be maintained in living condition.

(i) Applicant must submit a landscape, buffering, and screening plan as part of the site plan application addressing the requirements and timing of plantings. Screening and buffering must be installed as early in the development process as possible. Occupancy shall not be granted if screening and buffering requirements are not installed in accordance with the approved site plan.

(j) The Planning Commission may approve a modification to the landscaping, buffering, and screening standards where an alternate landscaping, buffering, and screening plan is provided that meets the purpose and intent of these design requirements.

(8) Parking, loading, and signage must be provided in accordance with § 1-19-6.200 through § 1-19-6.340.

(9) In addition to meeting the requirements of § 1-19-6.500, the following lighting requirements must be met:

(a) Pole mounted and building mounted lights must not exceed a height of 18 feet.

(b) Lighting shall include elements that reduce negative impacts to wildlife migration, nocturnal habits, and circadian rhythms, such as the utilization of lights with amber or yellow tints instead of blue or white light and the use of timers, motion detectors, and light-sensitive switches to actively regulate the emission of light from light fixtures.

(c) The Planning Commission may require more restrictive lighting standards where deemed appropriate by the Planning Commission.

(10) Bicycle rack requirements shall be in accordance with industrial parks in table § 1-19-6.220 (H)(1).

(11) Critical digital infrastructure facilities must meet all criteria found in §§ 1-19-7.600 and 1-19-7.610.

(E) *Subdivision and street frontage.*

(1) Subdivision of lot(s) for critical digital infrastructure uses shall comply with Chapter 1-16 of the County Code.

(2) Where two or more lots are proposed for critical digital infrastructure uses, the lot frontage requirement of § 1-19-4.520 may be met by construction of a private street subject to Planning Commission approval and the following:

(a) The lot or parcel from which the new lot is being created has fee-simple frontage on a public street.

(b) The private street connects directly to a public road.

(c) The private street will not serve any uses that would be frequented by the general public.

(d) For the purposes of establishing bulk regulations (setbacks, lot width, etc.), the measurements along the portion of the lot(s) fronting a private street must be the same as established for public streets.

(e) The design of the private street must comply with Chapter 1-16 of the County Code.

(f) Private streets may not create long, dead-end street networks and must serve a limited number of lots and sites, as determined by the Planning Commission.

(g) Private streets must be maintained by a property owner association or similar organization.

(h) Easements, maintenance agreements, and covenants must be provided to the County for review with the submission of a final plat, and must be recorded by the applicant prior to lot recordation and the recording reference noted on the final plat.

(F) *Performance standards.* These performance standards for critical digital infrastructure facilities are intended to mitigate potential detrimental effects on adjacent properties and the neighborhood. All applications for site plan approval must be accompanied by a registered engineer's certification that the use complies with all of the performance standards. If, after occupancy of the structures, continuous or frequent (even if intermittent) violations of the performance standards occur, and after notice is given, bona fide and immediate corrective work is not performed which successfully prevents the violation(s) from reoccurring, the Zoning Administrator may suspend or revoke the Zoning Certificate and the Certificate of Occupancy and require the operations and occupancy to immediately cease. The Zoning Certificate and Certificate of Occupancy will be reinstated after the property owner demonstrates to the Zoning Administrator's satisfaction, that operation of the facilities is able to conform to these requirements.

(1) *Noise.*

(a) Noise must be measured with a sound level meter.

(b) The maximum sound pressure levels permitted from any source, including but not limited to electrical equipment, air handlers, generators, and other mechanical devices, measured within an adjacent property line, are set forth below:

<i>Sound Measured To</i>	<i>Decibels Continuous Slow Meter Responses</i>
Industrial uses	70
Commercial uses	64
Residential uses in any zoning district	55

Institutional uses	55
All other uses	55

(c) All applications for site plan approval must include a sound study that is prepared by a qualified engineer with experience in environmental acoustics. The purpose of the detailed study is to assess the impact of all noise sources and determine the appropriate layout, design, and control measures. The study must include:

1. Details of assessment methodology.
2. List of all air handlers, generators, and other mechanical devices that are included in the sound evaluation, including manufactures specifications.
3. Predicted sound levels for three scenarios:
 - a. All mechanical and electrical equipment required for normal operation at 100% load.
 - b. Generator testing and maintenance.
 - c. Emergency scenario with all generators, mechanical equipment, and electrical equipment operating at 100%.
4. When multiple buildings are proposed on the site plan application, the study must include sound levels for each phase of building construction to ensure that the sound levels listed in the table in (F)(1)(b) above are met during all phases of buildout.
5. Summary of the results and recommended control measures.

(d) Within 6 months of the date of occupancy of any completed CDI building, and biennially thereafter, actual sound levels for scenarios a and b listed under (F)(1)(c)(3). above must be measured by a qualified engineer with experience in environmental acoustics and a final sound level report must be submitted to the county for review and approval. If actual sound levels exceed the maximum sound pressure levels listed in (F)(1)(b) above, corrective actions must be executed as soon as reasonably possible, but no later than 180 days from the date of the submission of the report.

(e) The provisions of this section do not apply to:

1. Transportation vehicles not under the control of the use.
2. Occasionally used safety signals, warning devices, and emergency pressure relief valves.
3. Temporary construction activity between 7:00 a.m. and 7:00 p.m.
4. Emergency and other exemptions identified in § 1-11-6(F).

(2) *Vibration.*

(a) No vibration may be produced which is transmitted through the ground and is discernible without the aid of instruments at any point beyond the property line; nor may any vibration produce a particle velocity of 2 inches per second measured at or beyond the property line. This provision does not apply between adjoining critical digital infrastructure facilities uses.

(b) All applications for site plan approval must include a vibration impact study that is prepared by a qualified individual with experience in vibration analysis.

(c) Within 6 months of the date of occupancy of any completed CDI building, and biennially thereafter actual vibration levels must be measured by a qualified individual and a vibration report must be submitted to the County for review and approval. If vibration levels exceed the maximum

listed in (F)(2)(a) above, corrective action must be taken as soon as reasonably possible but no later than 180 days from the date of the submission of the report.

(3) *Generators.*

(a) Generators must meet or exceed Tier 4 or equivalent emission standards as defined by the United States Environmental Protection Agency.

(b) Generator testing shall be limited to Monday through Friday, 8:00 a.m. to 5:00 p.m. Only one generator per building, or the minimum number necessary to meet operational standards, may be tested at a time and for a period not to exceed 60 minutes, unless federal or state law, rule or regulation, or utility company restrictions prevent testing during such time.

(c) Generators must be installed at ground level.

(d) *Stand-alone fuel storage tanks.*

1. For the purposes of this section, fuel storage includes the storage of all petroleum bases fuels, natural gas liquids, biofuels, and liquids derived from other hydrocarbon sources.

2. The storage tank shall be placed above ground with a capacity not to exceed 20,000 gallons.

3. Only one storage tank is permitted per critical digital infrastructure building.

4. The storage tank shall be located a minimum of 100 feet from a well or as provided in § 1-6-50 of the County Code (Wellhead Protection Ordinance), whichever is greater.

5. The storage tank shall be governed by the International Fuel Gas Code concerning storage tanks, and the National Fire Protection Association 30 standards.

6. Storage tanks shall have 100% catchment basin, or double-walled containment, and a spill protection overfill alarm.

7. Shall comply with § 1-6-50 of the County Code (Wellhead Protection Ordinance).

8. The storage tank must have a minimum setback of 100 feet from all property lines.

9. Storage tanks must meet all applicable state and federal regulations for above ground storage tanks.

(e) *Fuel storage tanks attached to stationary equipment:*

1. For the purposes of this section, fuel storage includes the storage of all petroleum bases fuels, natural gas liquids, biofuels, and liquids derived from other hydrocarbon sources.

2. Shall not have a capacity greater than 10,000 gallons per attached storage tank.

3. The storage tank and stationary equipment shall be located a minimum of 100 feet from a well or as provided in § 1-6-50 of the County Code (Wellhead Protection Ordinance), whichever is greater.

4. The storage tank shall be governed by the International Building Code 2006 as amended concerning storage tanks, and the National Fire Protection Association 30, as amended.

5. Storage tanks shall have 100% catchment basin, or double-walled containment, and a spill protection overfill alarm.

6. Shall comply with § 1-6-50 of the County Code (Wellhead Protection Ordinance).

7. The storage tank must have a minimum setback of 100 feet from all property lines.

8. Storage tanks must meet all applicable State of Maryland and federal regulations for above ground storage tanks.

(Bill No. 22-05, 3-15-2022; Bill No. 25-05, 5-20-2025; Bill No. 25-09, 9-2-2025)

DIVISION 11. CRITICAL DIGITAL INFRASTRUCTURE OVERLAY ZONE

§ 1-19-10.1100. CRITICAL DIGITAL INFRASTRUCTURE OVERLAY ZONE (CDI-OZ).

(A) *Purpose and intent.* The Critical Digital Infrastructure Overlay Zone is created for the purpose of directing Critical Digital Infrastructure Facilities and Critical Digital Infrastructure Electric Substations to industrial lands in proximity to data conveyance infrastructure and other industrial uses, while minimizing impacts to non-compatible uses and allowing for development of industrial lands not included in the Critical Digital Infrastructure Overlay Zone for other industrial uses.

(B) *Establishment of Critical Digital Infrastructure Overlay Zone.*

(1) A Critical Digital Infrastructure Overlay Zone may be created by the County Council, with the boundaries established by ordinance and identified on the Zoning Map.

(2) A Critical Digital Infrastructure Overlay Zone shall be established by the County Council only on lands with a comprehensive plan land use designation of Limited Industrial (LI) or General Industrial (GI) uses. The overlay may be established on lots or parcels of land that are designated LI or GI and which include portions designated Natural Resource (NR), provided that NR land will not be included for any density calculation and no allowable overlay uses will be permitted on the NR land.

(3) In establishing the area of the Critical Digital Infrastructure Overlay Zone, the County Council shall consider proximity to schools, colleges and universities, daycare centers, healthcare facilities, and residential uses.

(4) The Critical Digital Infrastructure Overlay Zone, as approved by the County Council, shall include less than 1% of the total land area of the county.

(5) Development of Critical Digital Infrastructure Facilities and Critical Digital Infrastructure Electric Substations in the Critical Digital Infrastructure Overlay Zone shall comply with § 1-19-8.402 Critical digital infrastructure facilities and § 1-19-8.403 Critical digital infrastructure electric substations.

(6) (a) Individual zoning map amendments for properties located within the Critical Digital Infrastructure Overlay Zone shall be subject to the approval criteria in § 1-19-3.110.4;

(b) In the event that the County Council approves removal of a property within the CDI-OZ from the Rural Legacy Area, an individual zoning map amendment application shall not be accepted or processed until final state approval of the revised Rural Legacy Area map is received.

(C) *Principal permitted uses.*

(1) All principal permitted uses in the underlying zoning district shall be permitted in the Critical Digital Infrastructure Overlay Zone subject to site development plan approval. Critical Digital Infrastructure Facilities and Critical Digital Infrastructure Electric Substations shall be a principal permitted use subject to site development plan approval in the Critical Digital Infrastructure Overlay Zone only in the LI and GI zoning districts.

(D) *Special exception uses.* All uses permitted by special exception in the underlying zoning district shall be permitted by special exception and site development plan approval in the Critical Digital Infrastructure Overlay Zone.

(Bill No. 25-09, 9-2-2025)

Appendix K. Prince George's County, MD Data Center Ordinance

Prince George's County Zoning Ordinance, [Section 27-5102 \(e\) \(4\) \(B\) Qualified Data Center](#).

(4) Business Support Service Uses

(B) Qualified Data Center

- i. A qualified data center shall include a site plan with any building permit application.
- ii. Qualified data centers shall be exempt from detailed site plan approval.
- iii. (Qualified data centers shall not be permitted in Designated Regional Transit Districts, Local Transit Centers (Local), Neighborhood Centers (Local), or Campus Centers (Local) as designated by the County's Plan 2035 General Plan, as may be amended from time to time.
Notwithstanding these requirements, qualified data centers may be permitted in the Bowie MARC Campus Center, as may be amended from time to time.
- iv. Qualified Data Centers shall comply with the following standards. Where the following standards may conflict with any other standard of this Ordinance, including any requirements of [PART 27-6: Development Standards](#), these standards shall control:

(aa)

Principal Building Facades

1. **(I)** For the purposes of this Section, principal building facades shall be defined as all exterior building facades that face public rights-of-way or existing residential development.
2. **(II)** Principal building facades shall include at least two (2) of the following design elements applied cohesively to the entirety of the face: changes in building height; building step-backs or recesses; fenestration; and/or changes in building material, pattern, texture, color, or use of accent materials. When a building has more than one principal building façade, such principal building facades shall be consistent in terms of design, materials, details, and treatment.

(bb) All exterior lighting shall be designed and constructed with cutoff and fully shielded fixtures that direct light downward and into the interior of the property and away from adjacent roads and properties.

(cc) Regulations concerning the net lot area, lot coverage and green area, lot width/frontage, yards, building height, intensity, accessory buildings, and other similar requirements for uses in the CGO Zone shall not apply. Instead, the minimum green area shall be 10 percent, the minimum front yard setback shall be 25 feet, the minimum side and rear yards shall be 20 feet, and the building height shall not exceed 35 feet. In addition, the applicant may propose these regulations on the site plan to be reviewed by DPIE and M-NCPPC staff and approved by DPIE.

(dd) Security fencing shall be effectively screened by a minimum depth of 40 feet of vegetation from all abutting residential properties and public rights-of-way. Security fencing shall not exceed ten feet in height.

(ee) The requirements of the Landscape Manual shall apply.

(ff) The minimum number of required off-street parking spaces shall be equal to the minimum number of parking spaces required for "distribution warehouse" by [Section 27-6305\(a\)](#), Minimum Number of Off-Street Parking Spaces, and the minimum number of required off-street loading spaces shall be equal to the minimum number of loading spaces

required for "Warehouse and Freight Movement Uses (except consolidated storage)" by Section 27-6310(a).

(gg) Regulations pertaining to signage shall be the same as those applicable to uses in the IE Zone as required by Section 27-61500, Signage, of this Ordinance.

(hh) Driveways for ingress and egress shall be identified on the site plan and shall be located so as not to endanger pedestrians or create traffic hazards.

(ii) The applicant shall submit an acoustical study prepared by a professional acoustical engineer that demonstrates the use will not violate the maximum allowable noise levels (dBA) set forth in Subtitle 19 of this Code.

v. In the RR Zone, the following additional requirements shall apply:

(aa) A qualified data center shall be located on land with a minimum acreage of 25 acres in size, at least 4,000 feet from a regional park, and the use shall be within a structure that is at least 300 feet from any residential use and at least 500 feet from any place of worship.

(bb) At least 30 days prior to submitting a building permit application, the applicant shall provide an informational mailing of the proposed application for a qualified data center permit to all adjoining property owners, registered civic associations and homeowners associations for the area within the respective Councilmanic District, as well as all municipalities within one (1) mile of the site proposed for development of the use. The informational mailing shall at least include the permit application number; a description of the property and its location; the nature of the applicant's request; the applicant's telephone number, mailing address, and e-mail address and a statement from the applicant inviting comment about the application; and DPIE's telephone number, mailing address, and e-mail address, to obtain more information and/or submit public comment about the application after it is filed. The applicant shall obtain the list of addresses and compliance affidavit from the Maryland-National Capital Park and Planning Commission. The applicant shall provide the affidavit to DPIE as proof of compliance with this informational mailing requirement as a prerequisite to acceptance of the application. The failure of a person or entity above to receive the informational mailing shall not be a basis for denial of the permit for a qualified data center.

Appendix L. Fairfax County, VA Data Center Ordinance

ZO 112.1-2024-9
ZO 112.2-2024-8

ADOPTION OF AN AMENDMENT TO CHAPTERS 112.1 and 112.2
(ZONING)
OF THE 1976 CODE OF THE COUNTY OF
FAIRFAX, VIRGINIA

At a regular meeting of the Board of Supervisors of Fairfax County, Virginia, held in the Board Auditorium, Lobby Level, Government Center Building, 12000 Government Center Parkway, Fairfax, Virginia, on Tuesday, September 10, 2024, the Board after having first given notice of its intention so to do, in the manner prescribed by law, adopted an amendment to Chapters 112.1 and 112.2 (Zoning) of the 1976 Code of the County of Fairfax, Virginia, said amendment so adopted being in the words and figures following:

BE IT ORDAINED BY THE BOARD OF SUPERVISORS OF FAIRFAX COUNTY, VIRGINIA:

Amend Chapters 112.1 and 112.2 (Zoning Ordinance), as follows

In Table 4101.1, revise the permissions for Data Center from P to P or SE in I-4, I-5, I-6. In Table 4101.2, remove the permission for a data center in the PRC District, and change the PDC and PTC permissions to SE.

3. Use Table for Residential, Commercial, and Industrial Districts

TABLE 4101.1: Use Table for Residential, Commercial, and Industrial Districts

P = permitted; SE = special exception; SP = special permit; blank cell = not allowed

A = allowed as accessory use only; A+ = permitted as an associated service use; AP = allowed with approval of administrative permit

Use	Residential Districts														Commercial Districts								Industrial Districts						Use-Specific Standards NOTE: General Standards also apply	
	R-A	R-C	R-E	R-1	R-2	R-3	R-4	R-5	R-8	R-12	R-16	R-20	R-30	R-MHP	C-1	C-2	C-3	C-4	C-5	C-6	C-7	C-8	I-1	I-2	I-3	I-4	I-5	I-6		
Industrial Uses																														
Freight Movement, Warehousing, and Wholesale Distribution: uses involving the movement, storage, and distribution of goods. Goods are generally delivered to other firms or the final consumer.																														
Data Center																	P SE	P SE							P SE	P SE	P SE	P SE	P SE	4102.6.A

4. Use Table for Planned Development Districts

TABLE 4101.2: Use Table for Planned Development Districts

✓ = permitted if shown on final development plan/PRC development plan and PRC plan;

✓/SE = permitted if shown on final development plan/PRC development plan and PRC plan, or as special exception if not on plan(s)

SE = special exception; SP = special permit; blank cell = not allowed

A = allowed as accessory use only; A+ = permitted as an associated service use;

AP = allowed with approval of administrative permit

Use	PDH		PRC				PDC		PRM		PTC	PCC		Use-Specific Standards NOTE: General Standards also apply	
	Principal	Secondary	Residential	Neighborhood Convenience Center	Village Center	Town Center	Convention/Conference Center	Principal	Secondary	Principal	Secondary		Principal		Secondary
Industrial Uses															
Freight Movement, Warehousing, and Wholesale Distribution: uses involving the movement, storage, and distribution of goods. Goods are generally delivered to other firms or the final consumer.															
Data Center								SE				SE			4102.6.A

Revise the data center standards in subsection 4102.6.A as shown below.

6. Industrial Uses

Freight Movement, Warehousing, and Wholesale Distribution

A. Data Center

Standards applicable to all data centers:

- (1) To provide visual screening and reduce noise levels, any equipment necessary for cooling, ventilating, or otherwise operating the facility, including power generators or other power supply equipment, must be fully enclosed, except where determined by the Director not to be mechanically feasible based on the manufacturer specifications. If the Director determines it is not mechanically feasible to fully enclose the equipment, it must be screened by a wall or similar barrier. In addition, any equipment as referenced above that is located on the ground and any accessory electrical substation must be screened from view from abutting lots and from rights-of-way by a visually solid wall or a building. This standard does not apply to solar panels.
- (2) In the C-3 and C-4 Districts, the maximum building size is 40,000 square feet of gross floor area. However, this size limit may be exceeded with special exception approval in accordance with subsection 8100.3.
- (3) In the I-2, I-3, and I-4 Districts, the maximum building size is 80,000 square feet of gross floor area. However, this size limit may be exceeded with special exception approval in accordance with subsection 8100.3.
- (4) **Minimum Distance from Residential**
 - (a) Any data center building must be located at least 200 feet from the lot line of an R district or a property developed with a residential use.
 - (b) If located on the ground, any equipment for cooling, ventilating, or otherwise operating the facility, including any power generator or other power supply equipment, must be either:
 1. Located at least 300 feet from the lot line of an R district or a property developed with a residential use; or
 2. Separated from the lot line of an R district or a property developed with a residential use by the principal data center building.
 - (c) Lesser distances may be allowed with special exception approval in accordance with subsection 8100.3.
 - (d) For the purpose of this provision, an R district does not include an area within a public street right-of-way.
- (5) A data center building must be located at least one mile from a Metro station entrance. A lesser distance may be allowed with special exception approval in accordance with subsection 8100.3.
- (6) Prior to site plan approval, a noise study must be submitted demonstrating to the Zoning Administrator's satisfaction that the operation of the data center will comply with the Noise Ordinance, Chapter 108.1 of the County Code. In addition, prior to issuance of a

Nonresidential Use Permit, a post-construction noise study must be submitted demonstrating to the Zoning Administrator's satisfaction that the operation complies with the Noise Ordinance.

Standards when permitted by right:

- (7) A data center building must include a main entrance feature that is differentiated from the remainder of the building façade by a change in building material, pattern, texture, color, or accent material. The entrance feature must also either project or recess from the adjoining building plane.
- (8) All building façades must include:
 - (a) A change in the façade surface for every 150 horizontal feet of at least one of the following: building material, pattern, texture, color, or accent material; and
 - (b) Windows, doors, or similar fenestration design features such as faux windows, must be distributed horizontally and vertically across the façade and comprise a minimum of 30 percent of the individual façade.

Standards when permitted by development plan or special exception:

- (9) A data center building must be designed to minimize adverse visual impacts on surrounding development as demonstrated by the submission of elevations, architectural sketches, or sight line studies. The building should have a high-quality design as evidenced by the use of materials, color, and texture. If the building is located less than 200 feet from an R district or a property developed with a residential use, it should include changes in building height or other design techniques to provide variation in building mass as viewed from the nearby residential district.

Add rezoning and special exception submission requirements for a data center. Renumber as needed.

8101. Submission Requirements

2. Zoning Map Amendments (Rezoning)

E. Supporting Reports and Studies

The following additional information must be submitted:

(12) Data Center

For a rezoning to allow a data center, the application requires the following additional information:

- (a) A noise study demonstrating that the operation of the data center will comply with the Noise Ordinance, Chapter 108.1 of the County Code.
- (b) Architectural depictions of the proposed building and associated equipment as viewed from all lot lines and street lines.

3. Special Exceptions, Special Permits, and Variances

D. Additional or Modified Submission Requirements for Specific Special Exception Applications

The following are additional or modified submission requirements for special exception applications for:

(8) Data Center

- (a) A noise study demonstrating that the operation of the data center will comply with the Noise Ordinance, Chapter 108.1 of the County Code.
- (b) Architectural depictions of the proposed building and associated equipment as viewed from all lot lines and street lines.

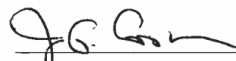
Add provisions for the Data Centers Zoning Ordinance Amendment to subsection 2.B of Appendix 1, Provisions Relating to Previous Approvals.

Data Centers

- (a) Any site plan for a data center accepted for review on or before July 16, 2024, will be reviewed based on the provisions of the Zoning Ordinance in effect on July 16, 2024, if:
 - 1. The site plan is approved by July 16, 2025;
 - 2. The approval remains valid; and
 - 3. The uses, features, and structures are established or constructed in accordance with approved plans and permits.An approved plan may be revised notwithstanding this amendment if it does not aggravate conflicts with the amendment. Building permits and other related subsequent plan and permit submissions may be accepted and new approvals may be granted, consistent with the approved site plan. The applicant/owner may elect to have the above applications reviewed in their entirety under the provisions of this amendment.
- (b) For all applications for rezonings and related development plans, special exceptions, site plans, or building permits that include a data center approved on or before July 16, 2024, the applicant/owner may continue under their previous approval. Subsequent plan and permit submissions may be accepted and new approvals may be granted, consistent with those prior approvals. Revisions to such prior approvals may be approved if they do not aggravate conflicts with this amendment.

These amendments shall become effective on September 11, 2024, at 12:01 a.m.

GIVEN under my hand this 10th day of September, 2024.



Jill G. Cooper
Clerk for the Board of Supervisors

Appendix M. Loudoun County, VA Data Center Ordinance

4.06.02 Data Centers

- A. **Applicability.** Section 4.06.02 applies to Data Center Uses. In addition to any other applicable requirements of Chapter 10, applicants must submit materials at the time of submission of a Site Plan that include any information necessary to evaluate conformance with standards in Section 4.06.02. Conditional or final Site Plan approval is contingent upon the applicant demonstrating conformance to standards in Section 4.06.02 and other standards of the Zoning Ordinance.
- B. **Data Center Use-Specific Standards.** Data centers must meet the Façade Standards in Section 4.06.02.C and the General Site Design Standards in Section 4.06.02.D.
- C. **Façade Standards.**
 - 1. **Principal Façade.**
 - a. **Applicability.** Principal Façade requirements apply to all building façades that face adjacent existing or planned public roads or that face an adjacent property with existing residential development, an approved CDP, or plat, or plan showing residential development, or Zoning District permitting residential uses; and all building facades adjacent to or facing property with the following existing uses or an approved CDP, plat, or plan showing the following uses:
 - 1. Uses listed in Chapter 3 under the Residential and Lodging use classifications;
 - 2. Uses listed in Chapter 3 under the Day Care, Financial Services, Food and Beverage Sales/Service, Government, Education, Arts, Entertainment, and Recreation, and Retail use categories; and
 - 3. The following additional uses: civic, social, and fraternal meeting place, community center, standalone religious assembly, cemetery, farm winery, community garden, and limited brewery.
 - b. **Requirements.**
 - 1. **Differentiated Surfaces.** Principal façades of a building must incorporate the following standards at horizontal linear intervals that may vary in frequency but must be no less frequent than every 150 horizontal linear feet or no less frequent than 3 times the average height of the building:
 - a. Fenestration or Fenestration and (Optional) Green Wall; and
 - b. A change in 1 of the following design elements:
 - A. Building material;
 - B. Pattern;
 - C. Texture;
 - D. Color; or
 - E. Accent materials.
 - 2. **Consistent Design.** When a building has more than 1 Principal Façade, the Principal Façades of such building must be consistent in terms of design, materials, details, and treatment.
 - 3. **Fenestration.** Each Principal Façade of a building must include Fenestration as follows:
 - a. **Fenestration Surface Coverage of the Façade.** Fenestration must comprise at least 30% of the total surface coverage area of the Principal Façade. **Distributed Fenestration Coverage.** Fenestration provided to meet the following:
 - A. Each placement or bay may count towards no more than 7.5% of such total surface coverage area.
 - B. Required 30% total surface coverage area of the Principal Façade must be located in separated, individual placements or clustered bays; and
 - b. **Fenestration Coverage Pattern.** The placement pattern of individual or clustered bays of Fenestration must be distributed horizontally and vertically across the Principal Façade; and
 - c. **Fenestration Consistent Design with Principal Façade.** The Fenestration must be compatible with the other design, materials, details, and treatment used on the same

Principal Façade.

2. **Green-Wall Treatment.**

- a. **Applicability.** A Green-Wall Treatment may be provided in lieu of up to half of the Fenestration Surface Coverage of the façade requirement of Section [4.06.02.C.1.b.3.a](#).
- b. **Requirements.** Green-Wall Treatments must provide the following:
 1. **Maintenance.** The owner, or the owner's agent, is responsible for the repair, replacement, and maintenance of the Green-Wall for the duration of the use;
 2. **Distributed Green-Wall Surface Coverage.** Green-Wall areas must be provided to meet up to half of the required 30% total surface coverage area of the Principal Façade of a building; and
 3. **Green-Wall Coverage Pattern.** The Green-Wall areas must be distributed horizontally and vertically across the Principal Façade.

3. **Data Center Mechanical Equipment Façade.**

- a. **Applicability.** If 2 Principal Façades are required on opposing sides of a building pursuant to Section [4.06.02.C.1](#), up to 1 Data Center Mechanical Equipment Façade pursuant to Section [4.06.02.C.3.b](#) may be provided in lieu of 1 such required Principal Façade if such Principal Façade faces an adjacent existing or planned public road.
- b. **Requirements.**
 1. **Data Center Mechanical Equipment Façade.** Optional Data Center Mechanical Equipment Façades must provide the following:
 - a. **Partial or Full Visual Screening of Data Center Mechanical Equipment.** Data Center Mechanical Equipment attached to or mounted on the building façade must be partially or fully visually screened from view at the ground level from all existing and planned public roads and adjoining parcels using mesh, lattice, cladding, or grillwork or a combination of these methods, or similar methods so as to ensure that the Data Center Mechanical Equipment is partially or fully screened to the maximum extent that permits necessary ventilation for any equipment; and
 - b. **Differentiated Surfaces.** The Data Center Mechanical Equipment Façade, including any provided screening methods, must incorporate a change in at least one of the following design elements at horizontal linear intervals that may vary in frequency but must be no less frequent than every 150 horizontal linear feet or no less frequent than 3 times the average height of the building:
 - A. Building material;
 - B. Pattern;
 - C. Texture;
 - D. Color; or
 - E. Accent materials.

4. **Main Entrance Feature.**

- a. **Applicability.** Each building containing a Data Center must include at least 1 Main Entrance Feature that meets the requirements of Section [4.06.02.C.4.b](#).
- b. **Requirements.**
 1. **Entrance Feature Design.** Main Entrance Features must either project or recess from the main building plane, and/or be differentiated from the remainder of the building façade by a change in building material; and
 2. **Foundation Plantings or Enhanced Landscaping.** Main Entrance Features must incorporate foundation plantings consisting of a mix of evergreen and deciduous shrubs, grasses, sedges, or rushes, and/or herbaceous perennials, ferns, or vines for a minimum of 50% of the length of the Façade. These foundation plantings are in addition to any required buffers and parking lot landscaping required by Section [7.04](#) and Section [4.06.02.D.11](#). Alternatively, in lieu of Foundation

Plantings, any required buffering and parking area landscaping may be provided at an enhanced rate of 20% of plant units greater than what is required pursuant to Section [4.06.02.D.11](#) and Section [7.04.06](#), respectively.

D. General Site Design Standards.

1. **Loading Bay Location.** Loading bays are permitted to be located on only 1 façade.
2. **Location and Screening of Data Center Mechanical Equipment.** All ground level and roof top Data Center Mechanical Equipment must meet the following standards: Data Center Mechanical Equipment must be shown on any proposed Site Plan and must be fully screened on all sides. Such visually solid screen must be constructed with a design, materials, details, and treatment compatible with those used on the nearest Principal Façade of a building;
 - a. **Perforation for Ventilated Screening.** As determined by the Zoning Administrator, screening for Data Center Mechanical Equipment may incorporate perforated surfaces on screening walls as necessary to permit ventilation of Data Center Mechanical Equipment;
 - b. **Separation from Residential.** Ground mounted Data Center Mechanical Equipment must be separated from adjacent property that has existing residential development, an approved CDP or plat or plan showing residential development, or Zoning District permitting residential uses, by a principal building, or is otherwise not permitted adjacent to property with existing residential development, an approved CDP or plat or plan showing residential development, or Zoning District permitting residential uses;
 - c. **Ground Mounted Prohibited in Front Yards.** Ground mounted Data Center Mechanical Equipment must not be located in any required front yard; and
 - d. **No Screening Requirements Adjacent to Industrially Zoned Property.** As determined by the Zoning Administrator, Data Center Mechanical Equipment located in a manner found to have no adverse impact on adjacent properties zoned IP, GI, or MR-HI is not required to be screened pursuant to Section [4.06.02.D.2](#), except that such Data Center Mechanical Equipment must be screened from any existing or planned public road.
3. **Refuse Collection and Loading Bay Area Screening.** Refuse collection areas must be fully screened on all sides and loading bays must be screened from view at the ground level from all adjacent parcels and existing or planned public roads.
4. **Utilities.** Data Centers are subject to Utilities requirements pursuant to Section [7.08](#).
5. **Transportation.** Except for the Mid-Block Passageway requirement pursuant to Section [7.07.03.C](#), which does not apply to Data Centers, Data Centers are subject to Transportation requirements pursuant to Section [7.07](#).
6. **LPAT Trails in RSCR Buffer Areas.** For any proposed Data Center use on a lot containing RSCR Buffer Areas or Adjacent Steep Slopes pursuant to Chapter [6](#), Trails must be provided as determined by the Department of Parks, Recreation, and Community Services in accordance with the LPAT Design Guidelines for a trail.
7. **Setbacks and Building Massing Adjacent to Residential.** The following requirements apply when a proposed Data Center is to be located on a property adjacent to property with existing residential development, an approved CDP or plat or plan showing residential development, or Zoning District permitting residential uses, including when the Data Center property and adjacent residential property are separated by a principal arterial or lesser designated roadway, per the Countywide Transportation Plan:
 - a. **Minimum Parking Setback.** Parking must be setback at least 50 feet from the common property line, provided existing forest and other natural screening exists within 50 feet of the lot line, and such forest and screening remains undisturbed or enhanced in accordance with Chapter 7; or, if no forest or natural screening exists, berms are provided at least 10 feet in height constructed to a maximum 2:1 slope on either side of the crown edge, and 10-foot-tall fencing and plantings are placed on top of the berm;
 - b. **Minimum Setback for Structures.** Structures must be setback at least 200 feet from the common property line;
 - c. **Change in Building Height.** If a building is located within 400 feet measured from the property line adjacent to property with existing residential development, an approved CDP or plat or plan showing residential development, or Zoning District permitting residential uses, any building façade facing the

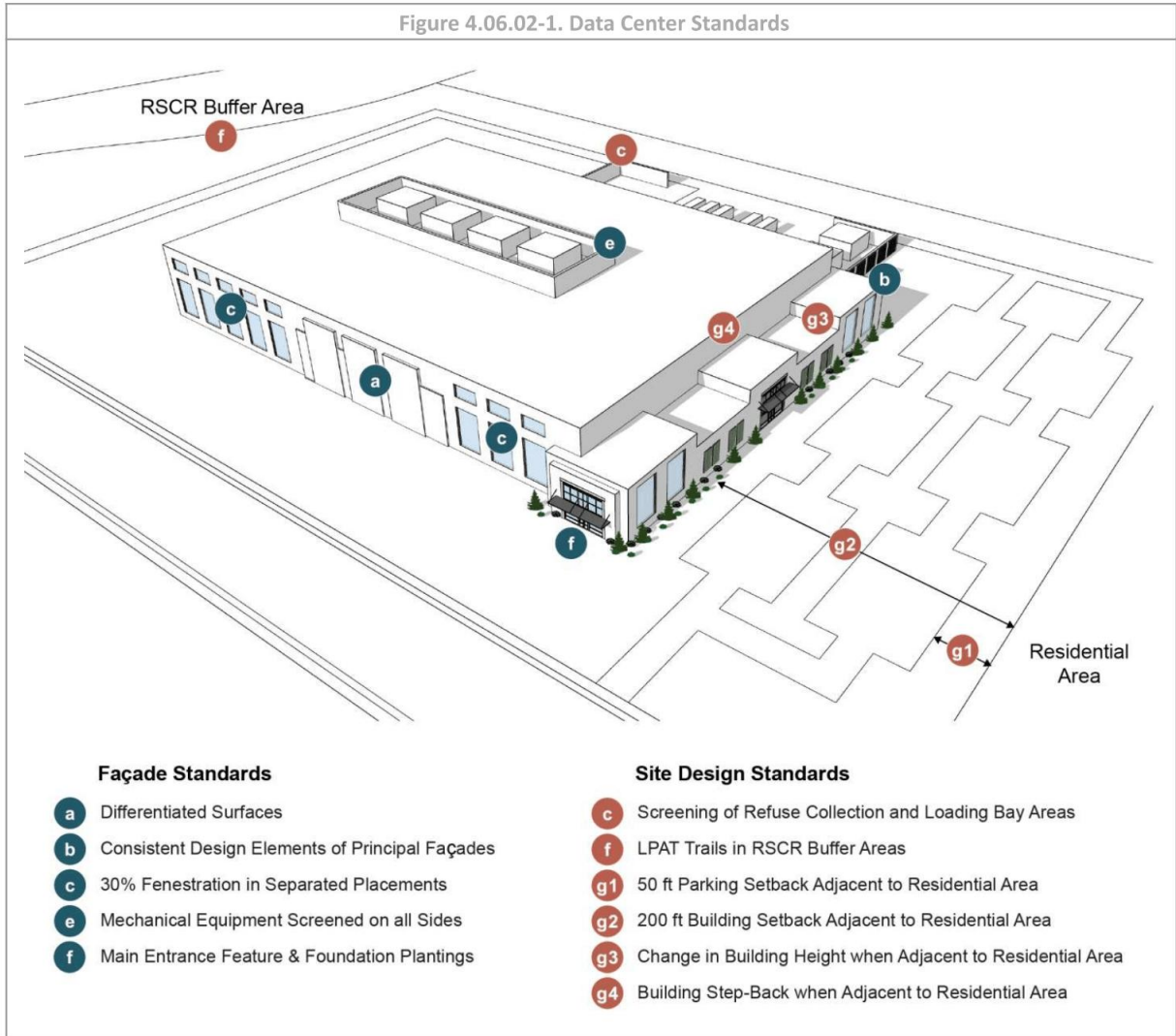
adjacent property must include a change in building height at a minimum interval no less frequent than every 150 horizontal linear feet or no less frequent than 3 times the average height of the building; and

- d. **Building Step-Back.** If a building is located within 400 feet measured from the property line adjacent to property with existing residential development, an approved CDP or plat or plan showing residential development, or Zoning District permitting residential uses, the building envelope must provide a step-back of no less than 15 feet from the building wall at a height point that begins at the top of the second story of the building or 40 feet, whichever of the 2 is lower.
8. **Generator Noise Adjacent to Residential.** For Data Centers on property adjacent to property with existing residential development, an approved CDP, or plat, or plan showing residential development, or Zoning District permitting residential uses, the following standard applies to generator testing, subject to Commonwealth regulations or permits issued for the property:
 - a. Generator testing is limited to between 5:00 p.m. and 7:00 m. between May 1 and September 30;
 - b. Generator testing is limited to between 11:00 a.m. and 5:00 p.m. between October 1 and April 30; and
 - c. Except for generator testing or commissioning activities, generator use is limited to backup/emergency use only.
9. **Light and Glare.** In addition to the requirements of Section [7.05.02](#), Data Centers must meet the following standards:
 - a. Data Centers must include a photometric plan that shows all exterior lighting, including any security lighting; and
 - b. Maximum illumination under Section [7.05.02.B.3](#) includes any security lighting.
10. **Noise Studies and Soundproofing.**
 - a. **Noise Studies.** Data Centers are subject to the Noise Study standards pursuant to Section [7.05.03.G](#).
 - b. **Soundproofing.** For Data Centers on property adjacent to property with existing residential development, an approved CDP, or plat, or plan showing residential development, or Zoning District permitting residential uses, any Data Center Mechanical Equipment located on the property, whether on a roof top, on the ground level, or elsewhere on the exterior of the property, must be screened on all four sides by an acoustical barrier. For purposes of this section, acoustical barrier is defined as an exterior solid or louvred wall containing sound-proofing materials designed to absorb noise and protect neighboring properties from noise pollution.
11. **Landscaping/Buffering/Screening.** All applicable regulations for Landscaping, Buffers, and Screening pursuant to Section [7.04](#) apply except as follows:
 - a. **Specific Plant Unit Composition Requirements.** In lieu of the requirements of Section [7.04.07.B.2](#), the following requirements apply to the plant types used to meet Section [7.04.03](#) Buffer requirements. Maximum percentages apply solely in determining the quantity of a given plant type that can be counted towards meeting a Plant Unit requirement and do not preclude the installation of additional plant material from that plant type, if desired.
 1. **Specific Plant Unit Percentages.** The following plant unit percentages apply to each property line where the buffer or road corridor buffer is required:
 - a. A maximum of 20% of the required plant units may be a combination of shrubs, ornamental grasses, and perennials.
 - b. A minimum of 40% and a maximum of 70% of the required plant units must be evergreen trees that are a minimum of 8 feet in height at the time of planting.
 - c. A maximum of 30% of the required plant units may be small deciduous trees.
 - d. A maximum of 30% of the required plant units may be large deciduous trees.
 - e. **Buffer Substitution Using Topography and Vegetation.** Use of natural topography and preservation of existing vegetation, supplemented by new vegetation, if needed, may be substituted for the above requirements if determined by the Zoning Administrator in consultation with the County Urban Forester to provide screening at the density, depth,

and height equivalent to the Buffer Type C with earthen berm or Road Corridor Buffer Type 3 with earthen berm.

2. **Specific Buffer and Berm Requirements.** In lieu of the buffer required under Table 7.04.03-1, a Buffer Type C is required with the specified plantings and located on an earthen berm that has a minimum height of 6 feet and a grade lower than 2:1. Use of natural topography and preservation of existing vegetation, supplemented by new vegetation, if needed, may be substituted if determined by the Zoning Administrator in consultation with the County Urban Forester to provide an equivalent density, depth, and height to the required Buffer Type C and earthen berm.
3. **Road Corridor Buffer.** If a Gateway Corridor Buffer is required pursuant to Section 7.04.02, the Gateway Corridor Buffer standards of Section 7.04 apply.

Figure 4.06.02-1. Data Center Standards



Appendix N. Prince William County, VA Data Center Ordinance

PART 509. - DATA CENTER OPPORTUNITY ZONE OVERLAY DISTRICT

Sec. 32-509.01. - Purpose and intent.

The Data Center Opportunity Zone Overlay District was created for the purpose of promoting development of data centers within areas of the County where there is existing infrastructure that could adequately support the proposed use. This District continues the County's efforts to attract and advance high-tech industrial development while limiting negative impacts to communities.

(Ord. No. 16-21, Attch., 5-17-16)

Sec. 32-509.02. - Establishment of Data Center Opportunity Zone Overlay District.

1. A Data Center Opportunity Zone Overlay District may be established by the Board of County Supervisors on lands in proximity to high voltage transmission lines of 115kv or more and planned or zoned for office or industrial uses.
2. A Data Center Opportunity Zone Overlay District shall be created and amended by ordinance upon resolution of the Board of County Supervisors. The boundaries shall be set using a map.
3. Said District shall overlay the existing zoning district. The regulations and requirements of the underlying zoning district and the Data Center Opportunity Zone Overlay District shall both apply, provided however, that when the regulations applicable to the Data Center Opportunity Zone Overlay District conflict with the regulations of an underlying zoning district, the Data Center Opportunity Zone Overlay District regulations shall apply.
4. Data Center Design Standards. Data Centers shall meet the following design guidelines:
 - (A) Principal building façades. Principal building façades shall include all building façades that face adjacent major arterials or interstates. When a building has more than one principal façade, such principal building façades shall be consistent in terms of design, materials, details, and treatment. Principal building façades associated with new construction shall meet the following standards:
 - (1) Principal building façades shall avoid the use of undifferentiated surfaces by including at least two of the following design elements:
 - a. change in building height;
 - b. building step-backs or recesses;
 - c. fenestration;
 - d. change in building material, pattern, texture, color; or
 - e. use of accent materials.

- (B) Screening of mechanical equipment. In order to minimize visibility from adjacent roads and adjacent properties, ground level and roof top mechanical equipment shall be screened from major arterials, interstates and abutting residentially zoned or planned properties. This screening may be provided by a principal building or existing vegetation that will remain on the property or is within a landscaping/buffer easement on an adjacent property. Mechanical equipment not screened by a principal building or existing vegetation shall be screened by a visually solid fence, screen wall or panel, parapet wall, or other visually solid screen that shall be constructed of materials compatible with those used in the exterior construction of the principal building. Notwithstanding the requirements of this section, mechanical equipment located in a manner found to have no adverse impact on adjacent roads and adjacent properties, as determined by the Planning Director, shall not be required to be screened.
- (C) Buffer yard requirement. A buffer yard is required in order to screen the data center from adjacent residentially zoned or planned properties. In lieu of the buffer yard requirement in DCSM Section 800, any side/rear yard abutting property that is not planned or developed with commercial or industrial uses shall include a buffer yard required plantings installed on an earthen berm that has a minimum height of six (6) feet and a slope not steeper than 2:1, planted to a type C DCSM buffer standard. The buffer yard plantings shall be installed in accordance with the requirements of the DCSM. Notwithstanding the requirements of this section, use of natural topography and preservation of existing vegetation, supplemented by new vegetation, if needed, or on the outside of a six foot tall solid fence, may be substituted for the above requirements when found by the Planning Director to provide visual screening from adjacent land uses at the density, depth, and height equivalent to the buffer yard with earthen berm.
- (D) Fencing. Fencing of the property is permitted, provided that fencing along public or private streets is not chain-link, with or without slatted inserts, and does not include barbed wire or other similarly visibly intrusive deterrence device. Chain-link fencing or barbed wire fencing are prohibited along public or private street frontages. This fencing allowance does not relieve a property owner from complying with all fire and access code requirements. The Planning Director may allow for alternative compliance with this requirement, provided the applicant demonstrates that the fencing visibility is reduced, through the use of landscaping and other methods to reduce visibility. Examples of permitted fencing include the following:



- (E) Data Centers are permitted an increased FAR, within the Data Center Opportunity Zone Overlay District, up to 1.0 FAR provided all other development standards (excluding FAR limitations) for the underlying district are met. Data center outside of the Data Center Opportunity Zone Overlay District may request an increase in FAR through a special use permit process, as described and allowed in Section 32-400.04 of the Zoning Ordinance.
- (F) Substations. Substations shall be screened from adjacent major roads or residentially zoned/planned properties as follows:
 - (1) Ten-foot-tall opaque fencing facing residentially zoned/planned properties.
 - (2) All other buffering and landscaping requirements of the DCSM shall still apply.
- (G) Building façades facing County registered historic site Manassas Battlefield Park. Building façades facing Manassas Battlefield Park, that are visible from viewshed anchors as identified in the Manassas Battlefields Viewshed Preservation Study, shall be non-reflective and dark green or dark brown in color. The Planning Director may approve other colors provided the colors are demonstrated to be earth tones that will help the building façade blend into the tree line.

(Ord. No. 16-21, Attch., 5-17-16; Ord. No. 19-24, Attch., 6-18-19)

Sec. 32-509.03. - Uses permitted by right.

All uses permitted by right in the underlying zoning district shall be permitted in the Data Center Opportunity Zone Overlay District. Data centers shall be permitted by right in the Data Center Opportunity Zone Overlay District in the O(L), O(H), O(M), O(F), M-1, M-2, and M/T zoning districts and in designated office or industrial land bays in the PBD and PMD district.

(Ord. No. 16-21, Attch., 5-17-16)

Sec. 32-509.04. - Secondary uses.

All permitted secondary uses in the underlying zoning district shall be permitted in the Data Center Opportunity Zone Overlay District.

(Ord. No. 16-21, Attch., 5-17-16)

Sec. 32-509.05. - Uses permitted by Special Use Permit.

All permitted special uses in the underlying zoning district shall be permitted by special use permit in the Data Center Opportunity Zone Overlay District.

(Ord. No. 16-21, Attch., 5-17-16)

Sec. 32-509.06. - Prohibited Districts.

Data centers shall be prohibited in agricultural, residential, PMR, B-2, B-3, and V districts.

(Ord. No. 16-21, Attch., 5-17-16)

Appendix O. Susquehanna County, PA Data Center Ordinance



ORDINANCE NO.2025-01

AN ORDINANCE OF SUQUEHANNA COUNTY, PENNSYLVANIA, AMENDING ITS SUBDIVISION AND LAND DEVELOPMENT ORDINANCE REGARDING THE DEVELOPMENT, CONSTRUCTION, OPERATION AND DECOMMISSIONING OF DATA CENTERS IN THE COUNTY.

WHEREAS, as authorized by the Pennsylvania Municipalities Planning Code (MPC), the Board of Commissioners of Susquehanna County regulates land use within the County through its Subdivision and Land Development Ordinance, currently codified as Ordinance #2005-1, as amended;

WHEREAS, upon the recommendation of the Planning Commission, the Board of Commissioners wishes to amend its Subdivision and Land Development Ordinance, as follows: amend Article VII Commercial and Industrial Land Development by adding new Section 713 Data Centers to provide for the development, construction, operation and decommissioning of Data Centers in the County;

WHEREAS, the County has, in accordance with the requirements of the MPC, submitted the proposed amendments to its Planning Commission, which gave its recommendations regarding the proposed amendments at a duly noticed public meeting;

WHEREAS, on December 29, 2025, the Board of Commissioners held a duly noticed and advertised public hearing to take public comment on the proposed subdivision and land development ordinance amendment; and

WHEREAS, the Board of Commissioners, having received such public comment as may have been given at the Public Hearings, and having received the recommendations of the Planning Commission, finds that enactment of the proposed amendment to the subdivision and land development ordinance will be beneficial to the health, safety, and welfare of the County and consistent with the MPC.

NOW THEREFORE, be it Ordained and Enacted by the County of Susquehanna Board of Commissioners, and it is hereby Ordained and Enacted by authority of same, as follows:

SECTION 1: AMENDMENT REGARDING THE DEVELOPMENT, CONSTRUCTION, OPERATION AND DECOMMISSIONING OF DATA CENTERS.

Alan M. Hall, Chairman **David Darrow**, Vice Chairman **Robert McNamara**, Commissioner
Rebekah Hubbard, Chief Clerk **Gabriel Fera, P.C.**, Solicitor

That the County Subdivision and Land Development Ordinance, currently codified as Ordinance #2005-1, as amended, is hereby amended to add the following as subsection 713 to Article VII:

Section 713 Data Centers

713.1. Purpose The purpose of this Section is to provide for the development, construction, operation and decommissioning of Data Centers in the County, subject to reasonable conditions that will protect the public health, safety and welfare.

713.2 Definitions Specific to Data Center Facilities

Data Center: A building or buildings which are occupied primarily by computers and/or telecommunications and related equipment where digital information is processed, transferred and/or stored, primarily to and from offsite locations. This use shall also include cryptocurrency mining, blockchain transaction processing, and server farms. A Data Center may include Data Center Accessory Uses. This use does not include computers or telecommunications related equipment that is secondary and customarily incidental to an otherwise permitted use on the property, such as servers associated with an office building.

Data Center Accessory Use: Ancillary uses or structures secondary and incidental to a Data Center use, including but not limited to: administrative, logistical, fiber optic, storage, and security buildings or structures; sources of electrical power such as generators used to provide temporary power when the main source of power is interrupted; electrical substations; utility lines; domestic and non-contact cooling water and wastewater treatment facilities; water holding facilities; pump stations; water towers; environmental controls (air conditioning or cooling towers, fire suppression, and related equipment); security features, provided such data center accessory uses/structures are located on the same tract or assemblage of adjacent parcels developed as a unified development with a Data Center. The use shall not include energy generation systems used or intended to be used to supply power to the Data Center during normal operations.

Closed-loop cooling system: A cooling system that circulates a single contained coolant or fluid that is not discharged to the environment as a normal part of operation (may include plate-and-frame heat exchangers, rear-door heat exchangers, immersion, or other sealed liquid cooling approaches).

713.3 Applicability This Section applies to all land development plans which provide for Data Centers to be constructed after the effective date of the addendum, Data Centers constructed prior to the effective date of this addendum shall not be required to meet the

requirements of this Section; provided that any physical modification to an existing Data Center that materially alters the size and type or other equipment shall comply with the provisions of this Section.

713.4 Procedures and Standards: A Data Center shall be considered a land development as defined by the this Ordinance and the application for the development of a Data Center shall be processed in accord with all the procedures established by this Ordinance for major subdivisions and land developments and shall comply with the following standards and requirements of this Section 713.

713.5 Data Centers and Data Center Accessory Uses

- A. Data Centers shall be permitted by when approved in compliance with the procedures, standards, and criteria contained in this section.
- B. For purposes of this section, sensitive receptors shall be defined as residential uses, schools, preschools, daycare centers, in-home daycares, long-term care facilities, retirement and nursing homes, community centers, places of worship, parks (excluding trails), campgrounds, prisons, and dormitories.

713.6 Dimensional Standards The dimensional standards of Data Centers and Data Center Accessory Uses shall be in accordance with Section 713.4, with the following exceptions:

- A. The maximum building height for a Data Center shall be [60] feet, inclusive of roof-mounted equipment such as cooling and ventilation systems, HVAC units and cooling towers.
- B. The maximum height of Data Center Accessory Uses shall be no greater than the height of the principal building.
- C. Data Centers and Data Center Accessory Uses shall be set back [200] feet from the boundary of [Residential] or the lot line of any property developed with a sensitive receptor.

713.7 Landscape Buffer

- A. An area of not less than fifty (50) feet in width shall be maintained along all property lines and road rights-of-way to provide a buffer. The buffer shall not be used for parking, storage or any other purpose except landscaping, crossing of

access roads or required utilities and discharge/intake lines. In determining the type and extent of the buffer required, the Planning Commission shall take into consideration the design of the project structure(s) and site, topographic features which may provide natural buffering, existing natural vegetation, and the relationship of the proposed project to adjoining areas.

- B. Any required landscaped buffer may be installed in the setback area, and shall consist of trees, shrubbery and other vegetation in accordance with Section 707.2 and shall be a minimum of twenty-five (25) feet in width. The buffer shall be dense enough to block the view of interior objects from the exterior of the lot and to assist with sound reduction as much as possible.
 - 1. Design details of buffers shall be included in the site plan, and buffers shall be considered improvements for the purpose of guaranteeing installation in accordance with the requirements for land developments in this Ordinance.
 - 2. It shall be the responsibility of the applicant and/or operator to maintain all buffers in good condition, free of rubbish, and replace any dying or dead plants or deteriorating landscape material.
- C. Screening and Fencing. The Data Center facility site shall be enclosed by a minimum six (6) foot high security fence.

713.8 Noise and Vibration

The applicant shall demonstrate through a sound study conducted by a professional acoustical expert that the sound generated by a Data Center and/or Data Center Accessory Uses during normal operations shall be limited to a maximum daytime (7:00 a.m. to 8:00 p.m. Monday-Friday) decibel level of 67 dB(A) and a maximum nighttime and weekend (8:00 p.m. to 7:00 a.m. Monday-Friday and all day Saturday and Sunday) decibel level of 57 dB(A) as measured from the property line of the use. Such sound study shall be conducted using Sound Level Meters described in ANSI S1.4-2104 and generally accepted methodology. A sound study shall be conducted at the following phases:

- A. A preliminary study shall be conducted as part of the [conditional use/special exception/land development] process. The preliminary sound study shall include recommended sound reducing materials or systems as needed to meet the aforesaid sound limits.

- B. An interim sound study shall be conducted during the building permit approval process based upon the proposed user or users of the Data Center and Data Center Accessory Uses depicted on the building plans. Any sound reducing materials or systems recommended by interim sound study shall be incorporated into the construction plans for the use.
- C. An as-built sound study shall be conducted six months after issuance of the certificate of occupancy and prior to the final escrow release for any land development phase. An as-built sound study may also be required thereafter by the County. If it is determined by the as-built sound study that there is a violation of the aforesaid noise limits, it shall be considered a violation of this Ordinance.
- D. Maximum decibel levels specified herein shall not apply during times of power outage, however the sound studies shall also evaluate, and report anticipated decibel levels when all emergency power generation equipment is running, including backup generators.
- E. The applicant shall provide a vibration study prepared by a qualified professional that demonstrates that no vibration from the Data Center, Data Center Accessory Uses, or associated equipment will be perceptible to the human sense of feeling beyond the property line.
- F. All costs for present and future noise and vibration studies, will be incurred by the applicant.

713.9 Water and Sewer

- A. If the use will be served by a public water supply, the applicant shall submit documentation from the public authority certifying that the public authority will supply the water needed.
- B. If the use is to rely upon nonpublic sources of water, the applicant shall provide a water feasibility study. The purpose of the study is to determine if there is an adequate supply of water for the proposed use and to estimate the impact of the use on existing wells, groundwater, and surface waters in the vicinity. Use of wells, groundwater and surface waters (including reservoirs, lakes and ponds) in the vicinity shall be limited to domestic uses (i.e., drinking, washing, sanitation). Water for cooling, humidity control, fire suppression and non-domestic uses shall

be sourced from rivers and streams only. No Data Center shall be approved unless the water feasibility study demonstrates that the anticipated water supply yield is adequate for the project and that the proposed water withdrawals and discharges will not endanger or adversely affect the quantity or quality of groundwater supplies or surface waters in the vicinity. The water feasibility study shall include the following information at a minimum:

1. The projected water demands of the Data Center.
 2. The source of water to be used.
 3. A description of how water will be used, including the amount or proportion of water to be used for each purpose (e.g. cooling, humidity control, fire suppression, and domestic usage).
 4. The long-term safe yield of the water source.
 5. A description of the amount or portion of water withdrawn that will be recycled or discharged and by what means.
 6. A geological map of the area with a radius of at least one mile from the site.
 7. The location of all existing and proposed wells within 1,000 feet of the property boundary, with a notation of the capacity of all high yield wells.
 8. The location of all surface waters, including perennial and intermittent streams, rivers, lakes, reservoirs, ponds, wetlands, springs, natural seeps, and estuaries, within 1,000 feet of the property boundary.
 9. A determination of the effects of the proposed water supply system on the quantity and quality of water in nearby wells, surface waters, and the groundwater table.
 10. A statement of the qualifications and the signature(s) of the person(s) preparing the study.
- C. The applicant shall provide proof of review and approval from either the Susquehanna River Basin Commission or Delaware River Basin Commission (whichever applies) for projects proposing:
1. Water withdrawals of 100,000 gallons per day (gpd) or more over a 30-day average from any source or combination of sources within;
or
 2. Consumptive water use of 20,000 gpd or more over a 30-day average from any water source.

- D. The applicant shall demonstrate that adequate means of wastewater disposal, including domestic wastewater and wastewater used for cooling or industrial purposes, have been provided and approved by the Sewage Enforcement Officer and/or the Pennsylvania Department of Environmental Protection.

713.10 Mandatory Cooling System Requirements

- A. Closed-Loop Required. All new data centers and qualifying expansions must employ closed-loop cooling for server racks and IT equipment. Use of open, evaporative cooling towers for facility heat rejection is prohibited unless an applicant demonstrates by clear and convincing evidence that closed-loop technology is infeasible for the specific project and the applicant obtains a conditional exemption under this Section and all applicable state permits. (Many recent model ordinances and drafts require closed-loop systems as a standard.)
- B. Conditional Exemption. An exemption may be granted by the County body upon a written request made at the time of land development or permit application and must include:
 - 1. Detailed engineering documentation prepared by a licensed professional engineer demonstrating that closed-loop technology is infeasible for the specific project.
 - 2. Proposed alternative technologies such as geothermal, air-cooled, direct-to-chip liquid cooling, or waste-heat recovery systems so long as they meet water-use, noise, and environmental standards set forth herein.
 - 3. The County may impose reasonable conditions on any exemption.
- C. Prohibition on private well dependency. Data centers may not be designed to draw primary cooling make-up water from private potable wells.

713.11 State Permits & Certifications (applicant responsibilities)

- A. Applicants must submit evidence of compliance with all applicable Pennsylvania DEP and federal NPDES requirements prior to issuance of any building or occupancy approvals. This includes:
 - 1. Water withdrawal registration/permit where withdrawals exceed state thresholds (e.g., registration/notice for >100,000 gallons/day purchase or >10,000 gpd in some critical areas).

2. NPDES coverage or individual permit for any planned discharge (cooling tower blowdown, process wastewater, etc.). Cooling tower blowdown is a known permitting category.

If the proposed system is truly closed loop and produces no discharge, the applicant must supply a sworn engineering statement and O&M manual explaining how the system will avoid routine discharge; the County reserves the right to require third-party validation.

713.12 Chemical Handling, Glycols, and Containment

- A. Anti-freeze or heat-transfer fluids (e.g., propylene glycol/ethylene glycol) used in closed loops must be non-hazardous where feasible. If hazardous materials are used, the applicant must provide spill prevention, secondary containment (sized for the full system volume), and a hazardous materials response plan.
- B. Routine testing for fluid leaks and an annual certification of containment integrity are required.

713.13 Energy, Efficiency, and Waste Heat Recovery

- A. Applicants must include a plan showing how the design minimizes energy and water use (PUE targets, closed-loop heat recovery opportunities).
- B. Power Supply
 1. If the applicant proposes to connect the Data Center to the electric grid, the applicant shall provide documentation from the applicable electric service provider certifying that the necessary capacity is available, and that electric service provider will serve the Data Center. Known impacts on electric rates or availability for other uses directly attributable to the Data Center project shall be noted.
 2. Any energy generation system designed or used to supply power directly to a Data Center during normal operations, including solar, wind, fossil fuel, or nuclear energy generating systems, shall not be considered part of the Data Center use. Such systems shall be considered a separate use and shall be approved according to all regulations applicable to such use.

- C. Undergrounding Requirement: All new primary distribution lines and associated electrical infrastructure serving a Data Center shall be installed underground from the utility's point of supply (or nearest manhole/transformer point) to the Data Center's point of service.
1. Design and Construction Standards: Underground installations shall comply with:
- a. The standards and specifications of the serving electric utility and any applicable national or industry standards (e.g., National Electrical Safety Code (NESC), National Electrical Code (NEC), and IEEE standards).
- b. County and municipal subdivision and land development specifications related to trenching, backfill, restoration, and right-of-way work.
- c. Minimum burial depths, conduit schedules, duct bank requirements, and warning tape/marker specifications as required by the County Engineer and the serving utility. (Typical minimum cover for primary feeder conduit shall be as required by the utility and NESC; applicant shall show compliance on plans.)
- d. Coordination with Utility: The Applicant shall obtain written confirmation from the serving electric utility that the underground design is acceptable and shall include utility comments in the land development submission. No final permit shall be issued until written utility acceptance is provided.
- e. Site Restoration: Applicants shall restore public rights-of-way, roads, sidewalks, and disturbed areas to pre-construction condition or better, including repaving, regrading, and revegetation as required by the County Engineer.
2. Exceptions and Waivers.
- a. Technical Impracticability: A waiver may be granted by the County or municipal governing body upon a written finding that undergrounding is technically impracticable due to one or more of the following:

- i. Existing subsurface utilities, geology, bedrock, groundwater conditions, or other physical constraints that make burial infeasible or unsafe.
 - ii. Conflicts with critical infrastructure (e.g., high-pressure gas mains, sewer interceptors) that cannot be reasonably relocated; or
 - iii. A serving utility's refusal to provide underground service despite reasonable design changes.
 - b. Process: Requests for a waiver must be made in writing at the time of land development or permit application and must include:
 - i. Detailed engineering documentation prepared by a licensed professional engineer demonstrating the basis for the waiver.
 - ii. A statement of efforts made to avoid or mitigate impacts and to coordinate with the utility; and
 - iii. Proposed alternative measures to protect reliability and aesthetics (e.g., screening, rerouting, buried/partially buried routes, enhanced design standards).
 - c. Emergency Repair Exception: Temporary above-ground installation for emergency repair of electric facilities is permitted provided that permanent underground replacement or remediation is completed within a period specified in the emergency authorization (not to exceed 180 days absent extension).
- 3. Financial Responsibility.
 - a. The Applicant shall be responsible for all costs associated with the underground installation, including design, permitting, trenching, conduit/duct bank, cable installation, connection fees, utility coordination, and final restoration, unless otherwise provided in a written agreement with the serving utility or municipality.
 - b. The County or municipality may require financial security (performance bond, letter of credit) to guarantee completion of underground utility installation and site restoration.

713.14 Emergency Management

The applicant shall submit an Emergency Response Plan (ERP) prepared by a qualified professional. The ERP shall:

- A. Be reviewed and accepted by the local fire department and emergency management services as part of the [conditional use/special exception/land development] process.
- B. Include detailed procedures for fire suppression, containment, ventilation, and evacuation;
 - 1. Include an evaluation of the access roads and hydrant locations within the site to ensure suitable access for emergency equipment within the site;
 - 2. Ensure that all first responders receive adequate training specific to the installed system;
 - 3. Include provisions for annual fire safety inspections demonstrating compliance with fire safety standards to be performed by a qualified professional on behalf of the Data Center.
- C. Any Data Center use proposing battery storage or any other device or group of devices capable of storing energy in order to supply electrical energy at a later time, whether the energy is stored for use on-site or off-site, shall demonstrate compliance with National Fire Protection Association (NFPA) Standard 855, Installation of Stationary Energy Storage Systems, or similar standards and must include fire suppression systems designed specifically for battery storage.
- D. No Data Center shall be approved unless the applicant demonstrates that procedures for fire suppression, containment, ventilation, and evacuation are sufficiently protective of public health, safety and welfare.
- E. The Data Center shall provide a 24-hour emergency signage visible at the access entrance to include a contact representative's name and 24-hour telephone number.

713.15 Signal Interface

The Applicant shall make all efforts to avoid any disruption or loss of radio, telephone, television or similar signals, and shall mitigate any harm caused by the Data Center.

713.16 Parking

- A. Data Centers are to be provided with at least one parking space per 8,000 square feet of floor area designed and intended to be accessible regularly by employees, or one parking space for every one employee, based upon the maximum number of employees on site during the largest shift, whichever is lesser.

713.17 Lighting

- A. Lighting and Glare

Lighting shall be controlled in both height and intensity; and lighting design shall be an inherent part of the project design. The standards of the Illuminating Engineering Society of North America shall be used as guidelines for the said design. The applicant shall provide the specifications of the proposed lighting and its arrangement on the site; and all required lighting shall be considered improvements for the purposes of guaranteeing installation in accord with the requirements for Article V.

- B. Areas to be Lighted

All access ways, off-street parking areas and areas of intensive pedestrian use shall be adequately lighted for safety purposes. Appropriate lighting fixtures shall be provided for walkways and to identify steps, ramps, and directional signs.

- C. Intensity

Maximum on-site lighting levels shall not exceed ten (10) foot-candles, except for loading and unloading platforms where the maximum lighting level shall be twenty (20) foot-candles. Light levels measured twenty (20) feet beyond the property line of the development site (adjacent to residential uses or public rights-of-way) shall not exceed one-tenth (0.1) foot-candle as a direct result of the on-site lighting.

- D. Shielding

No light source shall be exposed to the eye except those covered by globes or diffusers so that the lights are fully shielded to project the light substantially below the horizontal plane of the lowest point of the fixture. Other lighting shall be indirect or surrounded by a shade to hide visibility of the light source.

- E. Glare

No direct or sky-reflected glare, whether from overhead lighting, floodlights or from high-temperature processes such as combustion or welding or otherwise, shall be permitted so as to be visible at the property line.

F. Nuisances

The intensity, height and shielding of lighting shall provide for adequate and proper safety and shall not be a nuisance or hazard to drivers and residents of adjacent properties.

713.18 Decommissioning

- A. The Data Center (hereinafter “Facility”) Owner and Operator shall, at its expense, complete decommissioning of the Facility, within twelve (12) months after the end of the useful life of the Facility. The Facility will be presumed to be at the end of its useful life if it’s not used for a continuous period of twelve (12) months. The Facility Owner or Operator shall report to the County within 48 hours any cessation or discontinuation of use. If the County becomes aware of the cessation or discontinuation of use of the Data Center Facility by observation or report from a third party without receiving notification from the Facility Owner or Operator. In that case, the County may notify the Facility Owner or Operator of the report or observation in writing or by posting a notice on the premises that decommissioning must be completed within six (6) months of said notice.
- B. Decommissioning shall include removal of all hazardous materials and contents, including cabling, electrical components, and any other associated facilities. The Facility Owner or Operator shall certify that all hazardous materials and contents have been removed at the end of the twelve (12) or six (6) month period in Section A as applicable.
- C. Disturbed earth shall be graded and re-seeded, unless the landowner requests in writing that the access roads or other land surface areas not be restored.
- D. An independent and certified Professional Engineer shall be retained to estimate the total cost of decommissioning (“Decommissioning Costs”) without regard to salvage value of the equipment, and the cost of decommissioning net salvage value of the equipment (“Net Decommissioning Costs”). Said estimates shall be submitted to the Planning Commission after the first year of operation and every fifth year thereafter.
- E. The Facility Owner or Operator shall post and maintain Decommissioning Funds in an amount equal to Net Decommissioning Costs +10%. The Decommissioning Funds shall be posted and maintained with a bonding company, Federal or Commonwealth chartered lending institution chosen by the Facility Owner,

Operator, and participating landowner posting the financial security, provided that the bonding company or lending institution is authorized to conduct such business within the Commonwealth and is approved by the County.

- F. Decommissioning Funds may be in the form of a performance bond, surety bond, or other form of financial assurance that are acceptable to the County. These funds must be delivered before construction begins on the proposed project. This bond will be maintained by the municipality.
- G. If the Facility Owner or Operator fails to complete decommissioning within the period prescribed by Section 713.17 then the landowner shall have six (6) months to complete decommissioning.
- H. If neither the Facility Owner or Operator, nor the landowner complete decommissioning within the periods prescribed by Sections 713.17, A and G the municipality may take such measures as necessary to complete decommissioning. The entry into and submission of evidence of a Participating Landowner agreement to the County shall constitute agreement and consent of the parties to the agreement, the irrespective heirs, successors and assigns that the County may take such action as necessary to implement the decommissioning plan.
- I. The escrow agent shall release the Decommissioning Funds when the Facility Owner or Operator has demonstrated and the municipality concurs that decommissioning has been satisfactorily completed, or upon written approval of the municipality in order to implement the decommissioning plan.
- J. In the event of sale or transfer of the Facility, the acquiring agency shall adhere to the original monetary and operational decommissioning requirements set forth for the original developer.

713.19 Liability Insurance There shall be maintained a current general liability policy covering bodily injury and property damage with limits of at least \$3 million per occurrence and \$3 million in the aggregate. Certificates shall be made available to the County upon request.

SECTION 2: SEVERABILITY.

That if any sentence, clause, section, or part of this Ordinance is for any reason found to be unconstitutional, illegal or invalid, such unconstitutionality, illegality or invalidity shall not affect or

impair any of the remaining provisions, sentences, clauses, sections or parts of this Ordinance. It is hereby declared as the intent of the Board of Supervisors that this Ordinance would have been adopted had such unconstitutional, illegal or invalid sentence, clause, section or part thereof not been included herein.

SECTION 3: CONFLICT.

Any ordinances or any part of any ordinance which conflict with this Ordinance are hereby repealed insofar as the same affects this Ordinance.

SECTION 4: EFFECTIVE DATE.

That this Ordinance shall take effect immediately upon enactment as provided by law.

ENACTED AND ORDAINED into Law this the 29th day of December, 2025.

BOARD OF COMMISSIONERS:

ATTEST:

Alan M. Hall

Rebekah Hubbard, Chief Clerk

David Darrow

Robert McNamara

APPROVED AS TO FORM:

County Solicitor

Appendix P. Linn County, IA Data Center Ordinance

Prepared by Linn County Planning & Development
935 2nd Street S.W., Cedar Rapids, Iowa 52404-2100
(319) 892-5130
Return to Amanda Brown, Auditor's Office

LINN COUNTY ORDINANCE # _____

AN ORDINANCE AMENDING THE CODE OF ORDINANCES, LINN COUNTY, IOWA
BY MODIFYING PROVISIONS IN CHAPTER 107: ARTICLE VII SECTION 107-131 REGARDING
DISTRICTS AND DISTRICT BOUNDARIES, ARTICLE VII SECTION 107-151 REGARDING EU-3
EXCLUSIVE USE THREE LARGE-SCALE DATA CENTERS DISTRICT, ARTICLE VIII SECTION 107-
147-1 USE TABLE, AND ARTICLE IX SECTION 107-180 REGARDING DEFINITIONS RELATED TO
DATA CENTERS

BE IT ORDAINED by the Board of Supervisors, Linn County, Iowa as follows:

SECTION 1. SUBSECTION ADDED. Chapter 107, Article VI, Section 107-116 Standards for Industrial Uses § (e) is hereby added to read as follows:

- (e) *Small-Scale Data Center and other similar uses.* Small-scale data centers and other similar uses shall meet the requirements found in Section 107-151 § (d) through (m) of this chapter.

SECTION 2. SUBSECTION MODIFIED. Chapter 107, Article VII, Section 107-131 Districts and District Boundaries § (b) is hereby amended to include the EU-3 Exclusive Use District as follows:

- (19) EU-3 Exclusive Use Three, Large-Scale Data Center District

SECTION 3. SECTION ADDED. Chapter 107, Article VII, Section 107-151 EU-3 Exclusive Use Three, Large-Scale Data Center District is hereby added to read as follows:

- (a) *Purpose.* The purpose of the EU-3 Exclusive Use Three, Large-Scale Data Center District is to provide a clear, comprehensive, and predictable regulatory framework for the siting and operation of large-scale data centers within unincorporated Linn County. Large-scale data

centers are characterized by substantial long-term demands on public infrastructure, including electrical power, water supply, transportation systems, and emergency services, as well as potential impacts on surrounding land uses and environmental resources. This district is intended to ensure that such facilities are evaluated, located, and developed in a manner consistent with the Comprehensive Plan; that their infrastructure and operational impacts are appropriately reviewed and mitigated; and that the County can fulfill its long-term fiscal, infrastructure, and community responsibilities associated with hosting generational infrastructure facilities.

- (b) Principal permitted use.
 - (1) Large-scale Data Centers.
- (c) Accessory Uses.
 - (1) Battery energy storage systems (BESS).
 - (2) Solar arrays and other similar on-site renewable power generation systems.
 - (3) On-site standby or backup power generation.
 - (4) Electrical substations, switchyards, or power distribution equipment.
 - (5) District energy or microgrid infrastructure.
 - (6) Water treatment and recycling facilities.
 - (7) Office, maintenance, and employee support facilities incidental to the data center.
- (d) *Major site plan required.* A major site plan shall be submitted and reviewed prior to the approval of a large-scale data center. A large-scale data center shall require rezoning to the EU-3 zoning district, unless already located within such EU-3 zoning district.
- (e) *Additional information.*
 - (1) The following information shall be submitted on the major site plan, or in narrative form, supplied by the applicant with any application for rezoning to the EU-3 zoning district:
 - a. Legal description of all properties leased and/or owned, that are identified to be part of the project area;
 - b. A description of the project including development timeline, location of buildings, parking, approximate number of employees;
 - c. *Water Study.* A water study shall be submitted demonstrating that sufficient water resources are available to support the proposed use as described in Section 107-151 § (n)(1) below.
 - d. *Economic Development Agreement.* The applicant shall enter into an Economic Development Agreement ("EDA") with the County, approved by the Board of Supervisors as described in Section 107-151 § (o) below.
 - (2) The following information shall be submitted prior to issuance of the first building permit for the data center:
 - a. Planned location of underground or overhead electric lines, grid interconnection points, project entrances, staging areas, and access roads required during construction and post construction;
 - b. *Waste Management Plan.* A Waste Management Plan detailing how construction waste will be handled during the construction period. The plan shall include:

- i. Estimated volumes and types of materials to be generated.
 - ii. Identification of materials proposed for recycling, salvage, or reuse.
 - iii. Designated recycling and disposals facilities.
 - iv. Procedures for on-site material separation and storage.
 - v. Documentation requirements demonstrating final disposal or diversion;
 - c. Written verification from their proposed power provider that the applicant has calculated the maximum planned electrical consumption of the proposed use and has verified the utility supply and related electrical infrastructure is sufficient to accommodate the applicant's proposed use;
 - d. *Lighting Plan*. A lighting plan shall be submitted providing details of the light spread and intensity diagrams, fixture specifications and mounting height details. Any lighting used for outdoor illumination on the property shall be full-cutoff fixtures so that light does not shine upward nor adversely impact adjoining property.
 - e. A description of a backup power plan describing the fuel source and expected usage of any standby, backup, or temporary power generation systems. The plan shall identify the anticipated number and size of generators or other power units, anticipated testing frequency and duration, anticipated noise and emission control measures, and anticipated fuel storage or delivery methods. The plan shall demonstrate the data center will comply with all applicable local, state and federal permitting requirements.
 - f. *Road use agreement*. An approved Road Use Agreement containing the information and conditions specified in section 107-151§ (k) below is required before the start of construction.
 - g. *Pre-construction noise analysis*. Completed analysis shall be submitted in accordance with 107-151§ (l) below.
 - h. *Water Use Agreement*. The applicant shall submit a water use agreement to govern ongoing coordination between the applicant and the County regarding water use during operation of the facility as described in Section 107-151 § (n)(2) below.
 - i. *Emergency Response Plan*. The applicant shall submit an emergency response plan as described in Section 107-151 § (p) below.
 - j. Site and structure requirements, including:
 - i. Stormwater management plan;
 - ii. Stormwater pollution prevention plan;
 - iii. Erosion and sediment control plan;
 - iv. All Data Center production equipment (computers, servers, etc.) shall comply with Building Code requirements. Said structure(s) shall be placed on a permanent foundation.
- (3) For any data center facility consisting of one or more buildings (whether constructed simultaneously or in separate phases), the applicant shall not be required to submit or resubmit the items referenced in sections 107-151 §(e)(2)(a)-(i) as to any building

or phase of buildings constructed after the initial building permit is issued, if such building or phase of buildings were contemplated on the relevant submission delivered under said sections 107-151 §(e)(2)(a)-(i) in connection with the first building permit issued for the data center and the scope and footprint of the project has not substantially changed from the time of initial submission.

- (f) *Required setbacks.*
 - (1) 200 feet to property lines.
 - (2) 1,000 feet (measured from the closest outer wall of the closest building on the data center property) to the closest outer wall of a place of public assembly and to the property line of any residentially zoned property, including residentially zoned properties within city limits. The Board of Supervisors, in consultation with any impacted city, may reduce this setback with a majority vote. Impacted city means any city with residentially zoned property within 1,000 feet of the closest outer wall of the closest building on the data center property. "Residentially owned property" does not include properties in the agricultural, critical natural resources, commercial, or industrial zoning districts.
- (g) *Street access.* The site shall have access to a hard surfaced road of sufficient capacity to accommodate the traffic that the use will generate, with continuous hard surfaced connection to a county arterial, or state or federal highway.
- (h) *Access.* Vehicular access points shall create a minimum of conflict with through traffic movement.
- (i) *Parking.* Parking and loading shall meet the standards in section 107-93 §(e).
- (j) *Buffers.* Buffers shall be installed meeting the standards in section 107-93 §(d). In addition, lot frontage on a public street shall be separated from the edge of sidewalk or pavement by a landscaped yard of at least 20 feet in width, except where driveway accesses occur.
- (k) *Avoidance and mitigation of damages to public infrastructure.*
 - (1) *Roads.* Applicants shall identify all roads planned to be used for the purpose of transporting equipment for construction, operation or maintenance of the data center and obtain applicable weight and size permits from the impacted road authority prior to construction.
 - (2) *Existing road conditions.* Applicant shall conduct and provide evidence of a pre-construction roadway conditions survey, in coordination with the Linn County Secondary Road Department, to determine baseline road conditions and authority. The survey shall adequately document all road, road right of way, and public drainage infrastructure conditions requested for use during all phases of construction. Applicants shall enter into a Road Use Agreement with Linn County Secondary Road Department that clearly details responsibilities for on-going road maintenance and dust control measures for all identified Linn County jurisdictional roads during all phases of construction. The Road Use Agreement may require certain applicant and county undertakings, including but not limited to providing financial assurance in the form of an irrevocable letter of credit, bond, cash, escrow, parent guarantee or other form of security or guaranty acceptable to Linn County. At construction completion, Applicant shall, unless otherwise provided in the applicable Road Use Agreement, conduct and provide evidence of a post construction roadway conditions survey, in accordance with the Road Use Agreement and in coordination with the Linn County

Secondary Road Department, to verify that road conditions, to the extent impacted by applicant's use in the construction of its data center, have been restored, as far as reasonably practical, to pre-construction conditions or as otherwise required by the Road Use Agreement.

- (3) *Drainage system.* The applicant shall be responsible for repair of damage to public drainage systems stemming from construction, operation or maintenance of the data center. Applicant shall acknowledge any damage to public drainage systems and the responsibility for repair in a timely manner within 72 hours of damage discovery.
- (4) *Road Use Agreement.* An approved Road Use Agreement containing the information and conditions specified in this section is required before the start of construction.
- (l) *Noise Analysis.* No operating data center equipment shall produce decibel levels exceeding any of the following limitations, with the exception of initial construction and routine maintenance. Adequate setbacks and effective sound mitigating equipment shall be used to comply with these limitations:
 - (1) The average hourly noise level shall not exceed fifty-five (55) dBA or sixty-five (65) dBC as measured from the outer wall of any occupied structure within residentially zoned property adjacent to the proposed development. For property adjacent to the proposed development that is not residentially zoned, the average hourly noise level shall not exceed sixty-five (65) dBA or seventy-five (75) dBC as measured from the outer wall of any occupied structure. The average decibel limit is specific to source of the sound and does not count against cumulative ambient decibel levels as established in a baseline acoustic evaluation.
 - (2) Equipment testing, maintenance activities, and construction activities that generate elevated noise, including generator testing, shall be limited to the hours of 8:00 a.m. to 6:00 p.m., Monday through Friday, unless otherwise approved by the Zoning Administrator. County approval for excessive noise generation shall not be unreasonably withheld.
 - (3) The average hourly decibel level may be exceeded during short-term events such as severe windstorms.
 - (4) A pre- and post-construction noise evaluation shall be completed by a certified professional by the Institute of Noise Control Engineering (INCE), or a licensed Professional Engineer (PE) to verify compliance with the County's standards. The post-construction noise evaluation shall be completed after completion of all planned data center buildings at the end of construction (as defined in section 107-151(l)(5)).
 - (5) Commencing on the fifth anniversary of the end of construction, as defined hereafter, and continuing every five years thereafter, for so long as the data center operates, a noise evaluation shall be completed at the operators expense by a certified professional by the Institute of Noise Control Engineering (INCE), or a licensed professional engineer (PE) to verify compliance with the county's standards in section 107-151(l)(1). Completion of all data center buildings, or end of construction, means the date on which all of the following have occurred: completion of construction of the data center or, in the case of a phased or multi-building campus, all buildings of the multi-building data center campus, and issuance of a certificate of occupancy for all related buildings; and the data center operator has communicated, in writing, to the Zoning Administrator that it has completed the data center campus; provided, that, if all construction has stopped on the property for more than six (6) consecutive calendar months, other than due to delays by the

County in processing related permits or approvals, then “end of construction” as used herein shall be deemed to have occurred as of the last day of such calendar month. This six-month time frame may be extended by the Zoning Administrator.

- (6) The owner(s) of adjacent property may voluntarily agree, by written and recorded waiver, to a higher average hourly decibel level than those allowed within this subsection.
- (m) *Confidentiality and Open Records Compliance.* If an applicant submits information it believes to be a trade secret or otherwise confidential under Iowa Code Section 22.7 the applicant shall clearly identify such information at the time of submittal and provide the County with a written basis under Iowa Code Section 22.7 of why any and all information provided to the County is marked confidential. The County will treat such information in accordance with the Iowa Open Records Act, including the exemptions provided under Iowa Code Section 22.7, as amended. The County may disclose such information to staff or contracted reviewers solely for the purpose of evaluating compliance with this ordinance, subject to applicable confidentiality obligations. Notwithstanding this subsection, applicant acknowledges and understands that the County may only legally keep information confidential pursuant to Iowa Code Section 22.7.
- (n) *Water Supply and Sustainability Review.* Approval for large-scale data center projects shall be conditioned on the applicant demonstrating there is sufficient reliable water supply to meet all projected water demands without undue adverse impacts on existing users, aquifers, or watersheds. To demonstrate this, the applicant must comply with the following requirements:
 - (1) As part of any application for rezoning, special use permit, or other discretionary land use approval for a data center, the applicant shall submit a Water Study. The purpose of this plan is to demonstrate, at a planning-level, that sufficient water resources are available to support the proposed use without causing undue adverse impacts to existing water users, groundwater resources, or surface water systems. The plan shall describe the proposed water source(s), anticipated ranges of water demand, assumptions regarding cooling technologies, efficiency measures, system reliability considerations, and general contingency approaches for water supply interruptions or emergencies. The plan shall be prepared by a qualified professional and shall contain sufficient information to allow the County, reviewing bodies, and the public to understand and evaluate the potential water impacts of the proposed use.
 - (2) Prior to issuance of any building permit for a data center, the applicant shall enter into a Water Use Agreement with Linn County. The purpose of the Water Use Agreement is to govern ongoing coordination between the applicant and the County regarding water use during operation of the facility. The agreement shall address, at a minimum, water use monitoring, reporting frequency, data sharing protocols, and verification of compliance with applicable permits and approvals. The agreement may also include provisions addressing response procedures during periods of water supply constraint, drought, emergency conditions, or other circumstances in which water use reductions or operational adjustments may be necessary to protect public health, safety, or existing water users. The Water Use Agreement may include additional terms related to adaptive management, mitigation measures, and enforcement as determined appropriate by the County and Applicant. The Water Use Agreement shall also require the Applicant to demonstrate coordination with the Iowa Department of Natural Resources (IDNR) regarding applicable water use

permits, interference mitigation procedures, monitoring obligations, and compliance procedures.

- (o) *Economic Development Agreement.* Prior to or contemporaneously with the rezoning to the EU-3 zoning district, the applicant of a large-scale data center shall enter into an Economic Development Agreement ("EDA") with the County, approved by the Board of Supervisors. The purpose of the EDA is to establish ongoing cooperation between the County and the project operator, a description of any incentives that the project operator will receive (subject to the terms of the EDA), and to provide ongoing contributions that advance the County's fiscal, infrastructure, and community goals related to hosting large-scale data center facilities. The County shall retain full reasonable discretion to determine the form, structure, and use of funds or benefits provided under any EDA. At a minimum, the agreement shall provide for the creation of a Community Betterment Fund or similar mechanism to support public infrastructure, services, environmental protection, workforce development, or other community benefits, as determined by the Board of Supervisors. Additionally, as part of the EDA, the applicant shall consider implementing a Property Value Protection Plan. The purpose of the Property Value Protection Plan is to address potential impacts to nearby residential property values associated with the development and operation of the data center. Nothing in this section shall limit the County's authority to negotiate terms appropriate to the scale, location, and nature of a specific project, or to enter into separate agreements addressing road use, infrastructure improvements, or other matters related to the development of the large-scale data center.
- (p) *Emergency Response Plan.* The applicant shall submit an emergency response plan prior to any ground disturbance at the project site detailing the planned response actions that will be taken by facility representatives in the event of an emergency. These actions are intended to minimize health risks to personnel and people in the surrounding community, as well as minimize adverse impacts to the environment.
 - 1. The plan shall include, but is not limited to, a detailed narrative of response procedures and the facility representatives responsible for management of the following plausible contingencies that could occur at the facility: natural disaster/severe weather, fire, security incident, capacity/transmission, environmental, chemical, pipeline (if applicable), and medical. It shall include procedures for a site evacuation, designated egress routes and emergency staging areas.
 - 2. The plan shall include a stand-alone section detailing the emergency response protocols specific to battery energy storage areas (if applicable).
 - 3. The plan shall be developed in coordination with local first responders, Linn County Emergency Management & Linn County Public Health personnel.
 - 4. Notwithstanding anything in this section to the contrary, the applicant may redact confidential or proprietary information from any submission hereunder.
- (q) *Notification Requirements.* To assist in providing adequate notice to interested parties, the applicant for a rezoning to the EU-3 District shall:
 - (1) Within 14 days of filing the rezoning application with the planning and development department, mail a notice via first class mail to property owners and tenants within 1,000 feet of the subject site explaining the request and identifying the subject property.

- (2) Prior to the application being heard at the planning and zoning commission meeting, the applicant shall host a public informational meeting held at a location reasonably accessible to all identified property owners. Applicants must mail a notice of the public informational meeting via first class mail to property owners and tenants within 1,000 feet of the subject site.
- a. Applicants must submit a list of the property owners and tenants contacted, a copy of the notice sent, and a notarized affidavit stipulating to the mailing to the planning and development department.

SECTION 4. SECTION MODIFIED Chapter 107, Article VII, Section 107-147-1 Use Table is hereby amended to read as follows:

Transportation and Utility Uses		STD	AG	RR 1/2/3	VR	VM	USR	USR- MF	HC	GC	I	CNR	MH
Utilities	Utility generating plants and facilities (except wind farms, utility scale solar, gas-fired electric generating facilities, and nuclear energy generating facilities)		C						C	C	C		
	Gas-fired electric generating facilities, nuclear energy generating facilities and nuclear waste storage	See article VII, EU-2 Gas-Fired Electric Generating Facilities, Nuclear Energy Generating Facilities and Nuclear Waste Storage District											
Industrial		STD	AG	RR 1/2/3	VR	VM	USR	USR- MF	HC	GC	I	CNR	MH
Data Centers	Small-scale data center	107-116 (e)	C							C	C		
	Large-scale data center	See article VII, EU-3 Large-Scale Data Center District											

SECTION 5. SECTION MODIFIED. Chapter 107, Article IX, Section 107-180 Definitions is hereby amended to add the following definitions:

Data center means a facility consisting of one or more buildings (whether constructed simultaneously or in separate phases) used primarily for the storage, management, processing, and transmission of digital data, which houses computer or network equipment, systems, servers, appliances, and other associated components related to digital data

storage and operations. Data center includes commercial cryptocurrency mining operations and processing.

Small-scale data center means a data center that has an electrical design capacity of 20 MW or less, and that uses less than 50 gallons per minute of water or less on an annualized basis. For the purposes of determining compliance with power and water usage thresholds in this ordinance, all data center buildings that are part of a phased or multi-building campus shall be evaluated in the aggregate, regardless of whether such buildings are constructed simultaneously or in separate phases.

Large-scale data center means a data center that has an electrical design capacity greater than 20 MW or that uses more than 50 gallons per minute of water on an annualized basis. For the purposes of determining compliance with power and water usage thresholds in this ordinance, all data center buildings that are part of a phased or multi-building campus shall be evaluated in the aggregate, regardless of whether such buildings are constructed simultaneously or in separate phases.

Places of Public Assembly means buildings or facilities where people gather for civic, educational, religious, or cultural purposes, including, but not limited to retirement and nursing homes, schools, childcare homes and centers, group homes, hospitals, detention facilities, or human service facilities, not including facilities allowed as an accessory use to the principal use in question.

SECTION 6. REPEALER. All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed.

SECTION 7. SEVERABILITY. If any section, provision or part of this ordinance shall be adjudged invalid or unconstitutional, such adjudication shall not affect the validity of the ordinance as a whole or any section, provision or part thereof not adjudged invalid or unconstitutional.

SECTION 8. SAVING. The Code of Ordinances, Linn County, Iowa, shall remain in full force and effect, save and except as amended by this ordinance.

SECTION 9. EFFECTIVE DATE. This ordinance shall be in effect after its final passage, approval and publication as provided by law.

LINN COUNTY BOARD OF SUPERVISORS

Kirsten Running-Marquardt, Chair

Sami Scheetz, Vice Chair

Brandy Z. Meisheid, Supervisor

I, Linn County Auditor, hereby certify that the above and foregoing is a true copy of an ordinance passed by the Linn County Board of Supervisors.

Todd Taylor, Linn County Auditor

STATE OF IOWA
COUNTY OF LINN

This instrument was acknowledged before me on the ____ day of _____, 2026, by Todd Taylor as Linn County Auditor.

Notary Public, State of Iowa

Planning & Zoning Commission on the 20TH day of JANUARY, 2026.

Public hearing and First consideration on the 4TH day of FEBRUARY, 2026.

Second consideration on the 16TH day of FEBRUARY, 2026.

Third consideration and final passage on the 18TH day of FEBRUARY, 2026.

Published in the Gazette on the ____ day of _____, 2026.