DATA CENTERS 101

What Community Leaders Need to Know

A practical briefing for policymakers, local officials, and residents

PURDUE UNIVERSITY | Center for Regional Development

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WHAT IS A DATA CENTER?

What a Data Center IS

- A secure facility housing computer servers, storage systems, and networking equipment
- The physical backbone of the internet, cloud computing, AI, and digital services
- An industrial-scale operation requiring reliable power, cooling, and water
- Critical infrastructure for banking, healthcare, government, and everyday apps

What it is NOT

- NOT a traditional office — typically only 30–50 full-time employees operate on-site
- NOT a factory — no physical products are manufactured or shipped
- NOT a small operation — new hyperscale campuses can cover 200+ acres
- NOT low-impact — energy & water demands can rival entire neighborhoods

As of 2025, there are over 5,400 data centers in the U.S., up from ~1,000 in 2018.

Sources: EESI, "Data Center Energy Needs" (2025); Congressional Research Service, R48646 (2025); WRI, "How Data Centres Affect US Communities" (2025)

TYPES OF DATA CENTERS

Enterprise

Owned by one company (e.g., a bank or hospital) for its own IT needs. Smaller scale, on-site or nearby.

1–10 MW

Colocation

Shared facility where many businesses rent space for their servers. Think of it as an "industrial office park" for computing.

5–50 MW

Hyperscale

Massive campuses run by Amazon, Google, Microsoft, or Meta. These are the facilities most likely proposed in your community.

100–1,000+ MW

Edge

Small, distributed sites close to users for low-latency applications like autonomous vehicles and real-time AI.

Under 1 MW

MW = Megawatts of power capacity. For reference, 1 MW powers roughly 800 homes.

Sources: Dgtl Infra, "Types of Data Centers" (2024); Splunk, "Data Centers Explained" (2025); Congressional Research Service, R48646 (2025)

ENERGY DEMAND: THE #1 ISSUE

183 TWh
U.S. data center electricity consumed in 2024

4.4%
of total U.S. electricity demand (2023)

12%
projected share of U.S. electricity by 2028

What This Means for Your Community

- A single large hyperscale data center can consume as much electricity as 100,000 households
- Data center demand could raise average U.S. electricity bills by 8% by 2030 and by over 25% in high-demand markets like Northern Virginia
- In Loudoun County, VA, data centers consumed 21% of total power in 2023, surpassing all residential use (18%)
- Backup diesel generators at large campuses can produce significant air quality impacts

Sources: IEA, "Energy and AI" (2025); Pew Research Center (Oct 2025); Carnegie Mellon University; U.S. DOE Lawrence Berkeley National Lab (2024); World Economic Forum (2025)

BEYOND ELECTRICITY: WATER, NOISE & LAND

Water Consumption

- U.S. data centers consumed 17 billion gallons directly for cooling in 2023
- Could double or quadruple by 2028
- One Google facility in Iowa used 1 billion gallons in 2024 — enough to supply the state's residential water for 5 days
- Some centers use 25%+ of local community water supply

Noise & Air Quality

- Industrial cooling fans and generators run 24/7, producing constant low-frequency noise
- Backup diesel generators emit pollutants during testing and outages
- A 2024 Fairfax County, VA event saw 60 data centers switch to backup generators simultaneously
- Noise is a top concern for nearby residents

Land Use & Character

- Average data center site: 224 acres (2024), up 144% since 2022
- Largest campuses exceed 1,000 acres — about 1.6 square miles
- Often built on agricultural or rural land, altering community character
- Structures can reach 95+ feet tall with minimal windows

Sources: Lawrence Berkeley National Lab, "U.S. Data Center Energy Usage Report" (2024); WRI (2025); The Invading Sea / Google Sustainability Report (2025); Cardinal News (2025)

ECONOMIC TRADEOFFS: PROMISES VS. REALITY

Potential Benefits

- Property & equipment tax revenue — data center sector generated $162 billion in total government revenue in 2023
- Construction jobs during multi-year build-out phases
- 30–50 permanent, well-paying operations jobs per facility
- Potential for workforce training programs and local hiring commitments
- Improved broadband and digital infrastructure in some cases

Risks & Concerns

- Tax incentives can significantly reduce actual revenue to community — scrutinize abatements carefully
- Very few permanent jobs per acre compared to other industries
- Electricity rate increases may be passed to residential customers (up to 20% in some regions)
- Infrastructure costs (water, electrical substations, roads) may outlast the facility
- Loss of farmland and changes to rural community character

Key principle: Separate the promises from binding, enforceable commitments.

Sources: WRI (2025); Brookings Institution (2025); Cardinal News (2025); Data Center Watch (2025); TechPolicy.Press (2025); PwC / Data Center Coalition (2023)

QUESTIONS EVERY COMMUNITY SHOULD ASK

- How much electricity will this facility consume and who pays for grid upgrades?
- How many permanent local jobs will be created, and what qualifications are needed?
- What is the projected water demand, and what is the source? Will it compete with residential supply?
- What happens to infrastructure costs if the operator downsizes or leaves?
- What specific tax revenue will the community receive — net of any incentives or abatements?
- Will the developer agree to a binding Community Benefit Agreement (CBA) with public reporting?

Brookings recommends legally binding CBAs with public dashboards tracking jobs, tax revenue, and resource use.

Sources: Brookings Institution, "Why CBAs Are Necessary for Data Centers" (2025); TechPolicy.Press (2025); Airedale Community Acceptance Report (2025); WRI (2025)