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OKI Region 208 Plan Update

OKI Regional Planning Forum

March 3, 2026

Links

OKI 208 Plan Storymap: https://arcg.is/vyjb8

GIS Consistency Review Tool: https://apps.oki.org/fpa/

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Getting to Know Data Centers

OKI Regional Planning Forum

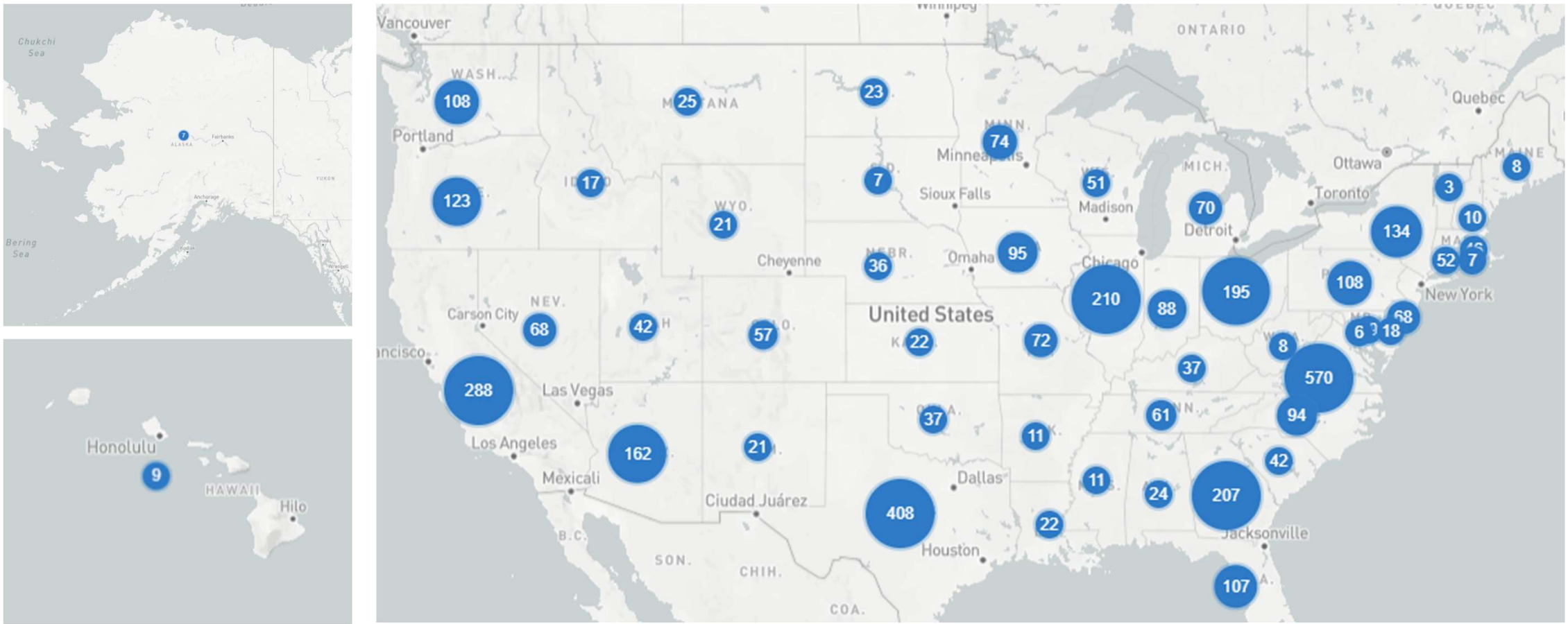
March 3, 2026

Purpose

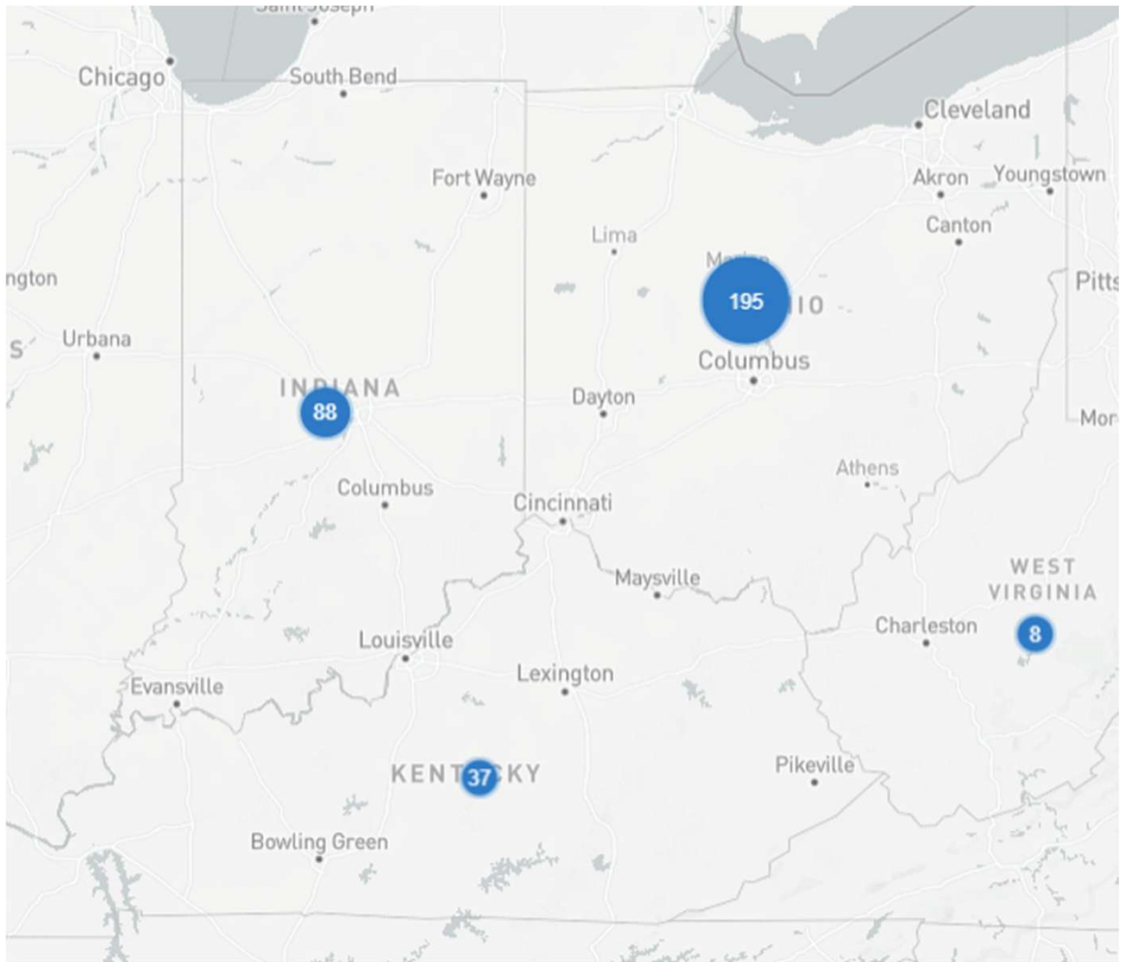
This presentation is intended to provide a factual overview of Data Centers to help planners better understand the physical and operational attributes of this emerging land use.

Nothing in this presentation should be interpreted as encouraging or discouraging the development of data centers, but is simply a collection of information we felt would be helpful to local communities in their preparations to possibly make zoning and development decisions on their own.

Data Centers Across America



Data Centers in the Region



There are 5,426 data centers in the United States.

51% of the world Hyperscale data centers are location in the U.S.

Across Ohio, Kentucky, and Indiana there are currently 320 data centers

Data centers can from 5,000 sqft to 10,000,000 sqft

The average size of Data Centers is 100,000 sqft

[USA Data Centers - 4036 Facilities from 1807 Operators]

AI vs. Traditional Data Centers

AI Data Centers

- Built specifically for machine and deep learning, AI-driven tasks, and are optimized for processing large volumes of Data
- Relies on GPU's (Graphics Processing Units) and TPU's (Tensor Processing Units) GPU's process thousands of task simultaneously
- GPU's processing power generates more heat than CPU's, therefore they need more advanced cooling solutions
- AI Data centers are designed for rapid scaling, organizations can quickly increase processing power
- Costly due to price of GPU's, high speed networking components, and specialized cooling needs.

Traditional Data Centers

- Made to handle a diverse workloads, hosting websites, enterprise applications. Databases, and Cloud services
- Relies on CPU's (Central Processing Units), efficient for storage and business applications
- Power consumption is balanced due to the wide range of workloads
- Significant funds and time needed to expand facilities
- Hardware is cheaper as many components are standard equipment

Types of AI Data Centers

On-Premises – Privately owned and operated by a single organization and housed with the organization's infrastructure, offering complete control over hardware and data security. Ideal for companies who work with significant data.

Cloud-based – Scalable and flexible, allowing companies to adjust resources depending on AI workload demand. Service providers include AWS, Google Cloud, and Microsoft Azure.

Hybrid – Provides the scalability of a Cloud-based Data center, while offering control like an On-Premises data center by being housed in the company’s infrastructure

Hyperscale – The Largest facilities designed for large operations, they house thousands of servers, often used by major cloud providers. (Amazon, Google, and Microsoft)

Co-location - Offers businesses to rent, space, power, and cooling inside a larger data center owned by a third party. Useful for businesses not needing hyperscale capacity but want advanced infrastructure.

Data Center Example 1

QUADRANET™
DATA CENTER INGENUITY MADE SIMPLE.

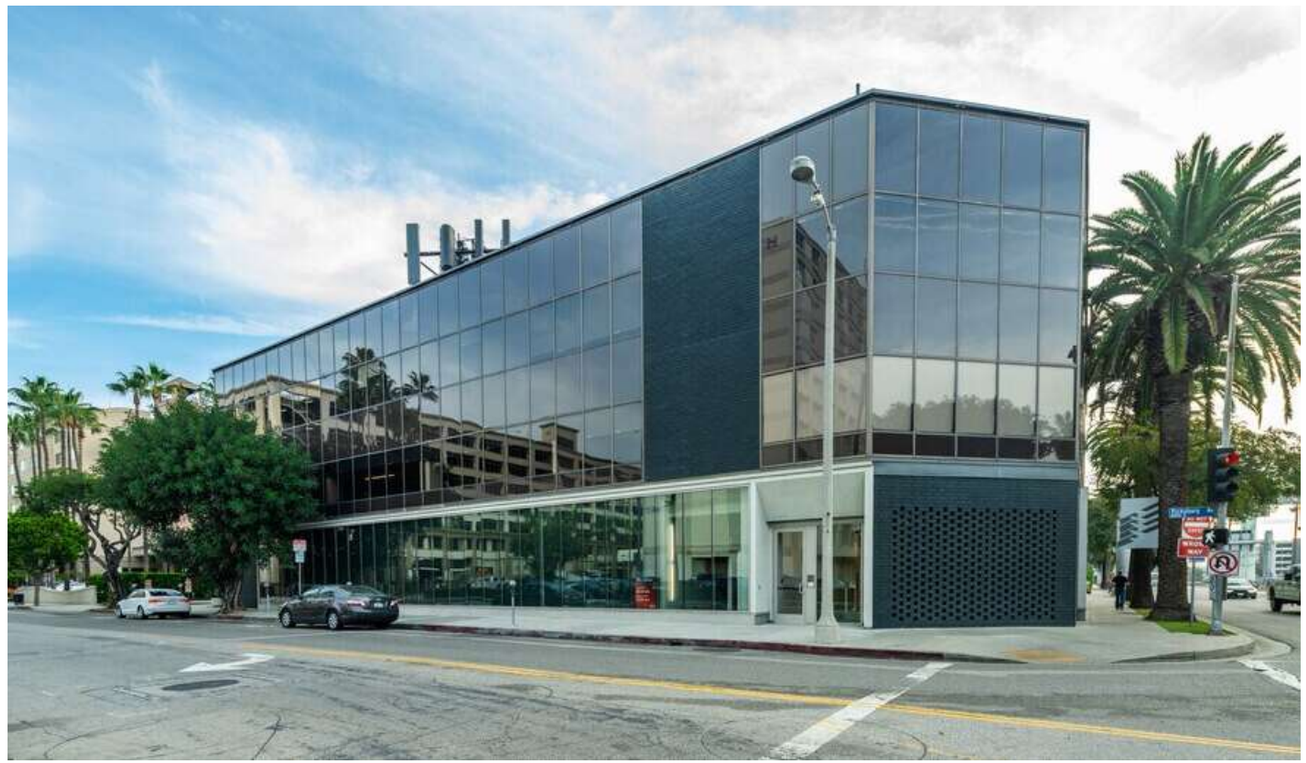
Location: 6171 West Century Boulevard, Los Angeles, CA, USA

Size: 80,000 sqft (22,000 sqft colocation space)

Data Center Type: Co-location

Total Power: 2.0 MW

“QuadraNet blends colocation, dedicated servers, cloud services, and managed solutions to deliver a comprehensive infrastructure platform for customers seeking flexible, scalable, and reliable hosting.”



Data Center Example 2

Location: 100 Digital Crossroad Dr., Hammond, IN, USA

Size: 105,000 sqft

Data Center Type: Colocation

Total Power: Approximately 6-20 MW (expansion up to 100MW)

Cooling Type: Water Cooling

Digital Crossroads: Hammond Data Center

Data Center Example 3

Location: 750 Alta View Boulevard, Columbus OH, USA

Size: 256,000 sqft

Data Center Type: Hyperscale/Co-location

Total Power: 27.0 MW

“Helps customers and partners to connect together for computing, storage, networking and growth.”

Data Center Example 4

Microsoft Azure

Location: 101 Herbet Drive. Boydton VA, USA

Size: 1,100,000 sqft

Data Center Type: Hyperscale Cloud Infrastructure

Total Power: N/A

“Microsoft Azure enables users to build, deploy, and manage applications through Microsoft managed data centers.”

Data Center Employment

Industry Benchmarks

- **Small facilities (1–5 MW)**: 8-15 staff
- **Medium facilities (5–20 MW)**: 15-35 staff
- **Large facilities (20 MW+)**: 35+ staff

Other Factors?

- Level of Automation can reduce staffing requirements
- Facility Type, Colocation facilities need staff for client support

Full-time Personal Needed

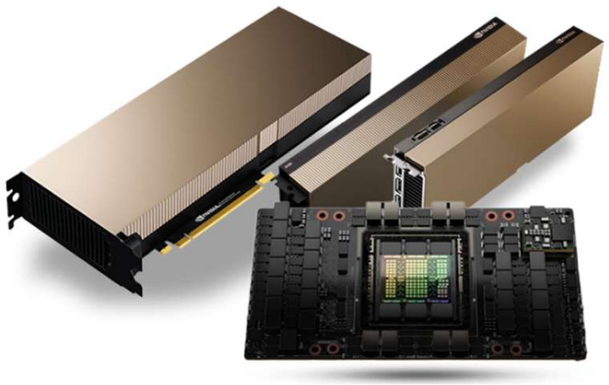
Critical Environment Technicians, Network Operations Staff, Security, Maintenance and Engineering, and management and support

Trends in Construction

Data Centers are designed for function and not appearance

- Large, sometimes windowless, warehouse style of building
- Concrete or metal panel walls
- Security fencing
- Cooling Units on roof or to the side of the building
- Back up generators and fuel tanks

What's in A Data Center?



GPU/AI Accelerators

- High performance chips used for processing large workloads

CPU's

- Coordinate workloads & manage system task

High band-with Interconnects

- GPU's need to communicate constantly

Optical Fiber cabling

- Supports massive data throughput

Storage systems

- Cold storage for archived datasets and model versions
- High speed SSD storage for active data sets

Power Infrastructure

Megawatt(MW) Capacity (City of 50,000 uses about 50MW per day)

- Mid scale – 20-100 MW
- Hyperscale – 100-500 MW
- Next Generation facilities are approaching 1 GW(1000 MW)

Others

- Back up **generators**, diesel or natural gas powered
- On site **power substations** to connect to the electrical grid, allowing monitoring and control of power usage
- **PDU's** (Power distribution units) to power the multiple components

Cooling Infrastructure

Water Cooling & Sources

- Water consumption varies between system design and climate of the site
- A 100 MW data Center can use **2 million liters (almost 528,000 gallons per day)** [1]
- **Blue sources –** Natural water sources, subject to permitting and purchase of water rights
- **Piped sources –** municipal water supply
- **Gray sources –** Reclaimed and recycled water
- Potable water is preferred to support equipment's longevity

1 - Jennings, Charlotte. 2025. “The Cloud Is Drying Our Rivers: Water Usage of AI Data Centers.” EthicalGEO, July 23, 2025

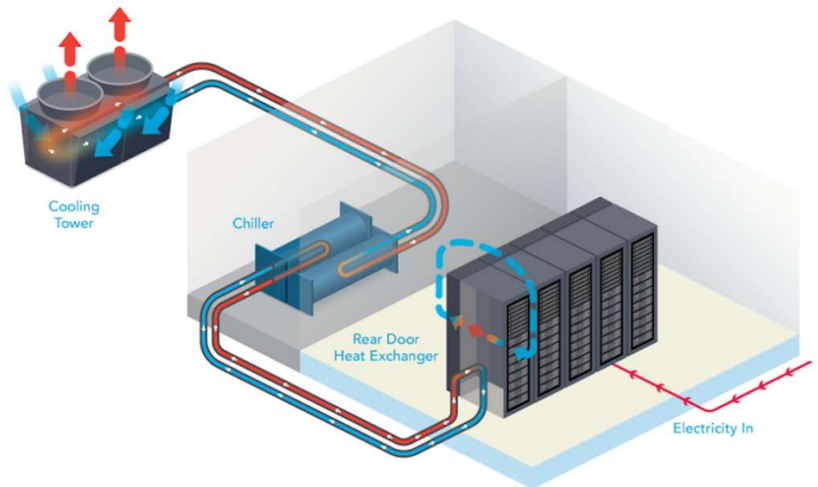
Types of Liquid Cooling

Direct to Chip Liquid Cooling – requires cold plates connected directed to GPU/CPU's, moderate to High water use, effective and the most common cooling method used.

Immersion Liquid Cooling - The entire server sits in dielectric liquid, highly effective method but needs high amounts of investment

Closed Loop Cooling – The system Circulates coolant through a closed loop of tubing, moderate resource use, matches Direct to Chip in scale of cooling effectiveness

Evaporative Cooling – Evaporates Water to cool air and reject heat, good for building cooling but not as effective for equipment cooling



Permits

Air Quality Permits

- Air Emission Permits under the Federal Clean Air Act (Backup generators)

Water Permits

- Stormwater permits
- Water Withdrawal Permits if center draws from a public source
- Wastewater Permits if discharging into public systems or waterways

Environmental

- Federal Funding or Lands are involved the following may apply:
  - environmental review under **NEPA (National Environmental Policy Act)**
  - potentially requiring an **Environmental Assessment (EA)** or **Environmental Impact Statement (EIS)**

Utility and power

- energy infrastructure permits for grid connection and generators on site

Specialized Permits

Influenced by Design and Location

- **Telecommunications Permits -** Right-of-way permits for fiber optic and network lines
- **Hazardous Materials and Fuel Storage -** Permits for storing fuels and controlled chemicals
- **Brownfield –** Site Clean up certifications,

Traffic Concerns

The construction phase(High Impact) – Heavy truck traffic as equipment is being moved to the site, inflow of personal vehicle traffic. Possible damage to road due to the heavy machinery.

The equipment phase(Moderate Impact) – Delivery of Back up generators, cooling systems, transformers, and server racks.

Employee Traffic(low Impact) – Data center employ less people than most factories and offices, mostly shift based technicians and security will be commuting

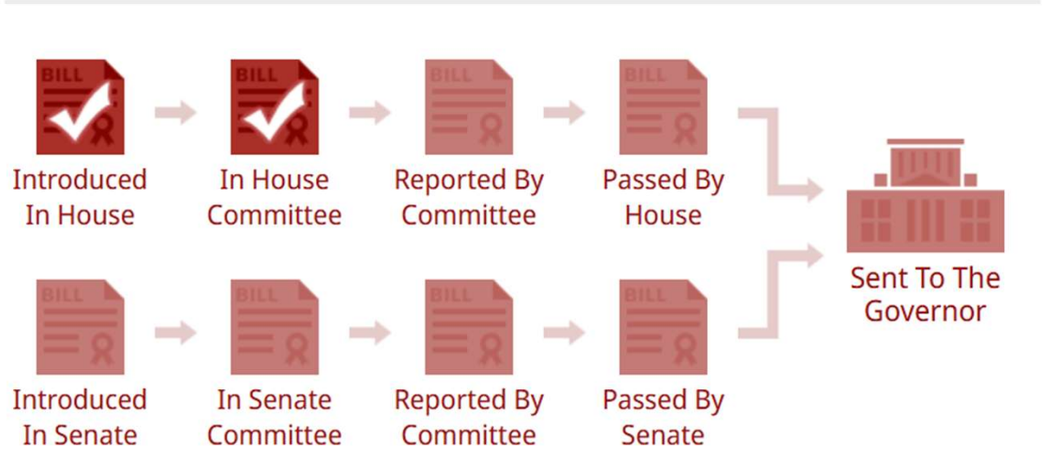
Noise Concerns

Cooling and Power Equipment – moderately low, but constant tonal hum from pumps and transformers. Can be addressed using sound barriers and/or site placement to avoid impacts to surrounding properties.

Backup Power Generators – louder, but short duration during periodic tests of backup generators or use during a power disruption. Can be mitigated through staggered generator testing.

Construction Phase – noise, at times significant, during the construction phase of the project. Can be scheduled to occur at times to have least impact on neighbors.

Ohio HB646



What is it?

Ohio HB646 is a legislative Bill that would create a Data Center Study Commission if passed.

A commission of 15 individuals chosen by various state leaders would focus on issues like environmental impact, effects on the electrical grid, and economic implications.

The commission would produce a report to the Governor and Legislature not more than 6 months following the date the bill is signed that outlines the findings and legislative recommendations.

Indiana House Bill 1210

What is it?

- A large omnibus bill has passed both chambers of the Indiana Legislature and is headed to Gov. Mike Braun's desk.
- Among many provisions, it includes language aimed at **encouraging local communities to approve data center projects**.
- Specifically, for data centers that receive future **sales tax exemptions**, the bill would require those companies to give up to **1 % of those tax savings on energy/equipment** back to the local city or county.

Kentucky House Bills 593 & 544

What is it?

House Bill 593

- Would ensure that **data centers do not indirectly raise utility costs for other customers** (electricity, water, gas, wastewater).
- Under the proposal, a data center operator must either:
  - Provide its own electric generation and donate excess power to the local utility;
  - Enter a **power purchase agreement**; or
  - Buy power on the open market.
- It also includes a **non-refundable $75,000 application fee** and provisions intended to make sure upgrades or new generation capacity needed to serve a data center are paid for by the company rather than existing ratepayers.

House Bill 544

- Would create a **new rate class for large-load data centers** (above a set capacity threshold, e.g., 100 MW) and require utilities to seek Public Service Commission approval for special tariffs (including contract terms, fees, and financial assurances)

Questions and Discussion

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