NDSU | EXTENSION

Data Centers: A Guide to Common Questions

What is a Data Center?

Adapted with permission from the University of Minnesota. November 4, 2026

A data center is a facility that houses computer and network equipment, servers and other related equipment for storage, management, processing, and transmission of digital data. Data centers vary in size and function: local governments may encounter small enterprise facilities, edge data centers, hyperscale campuses, or compute-intensive facilities such as cryptocurrency mining (see Table 1).

A data center supports digital services such as storage, computing, cloud services, artificial intelligence, and online applications. There are different types of data centers, and they can have very different local impacts. Local jurisdictions may specify different requirements based on varying sizes and functions or apply more uniform rules across data centers as a single category (see Section Defining Data Centers).

Knowing the Type of Data Center in Question is Key

Different types of data centers have varying requirements that may impact local decision-making. Local government decisions – from community engagement to local ordinances – may benefit from tailoring discussions to specific types of data centers.

Enterprise data centers are often smaller facilities that support a company's own computing needs. **Edge data centers** are located closer to end users and are used to collect, process, or transmit data with lower delay. **Hyperscale data centers** are very large facilities built to support large-scale cloud, artificial intelligence, or other high-volume digital services. **Cryptocurrency mining facilities** are specialized computing facilities used to support cryptocurrency transactions.

These categories matter because they do not have the same requirements.

Table 1. Different types of data centers and their requirements

Edge	Cloud/ Enterprise	Colocation	Hyperscale	Crypto Mining
Smaller, localized facilities closer to end users	General computing, storage, and internet services	Large, multi-tenant or shared facilities that support various users	Large facilities or a campus of multiple facilities	Specialized computing for cryptocurrency transactions
1-10 MW	**1-20 MW**	**Varying sizes** (from smaller enterprise to large hyperscale)	**20-500+ MW**	**5-100 MW**
<1-40 acres	**1-10+ acres**		**50 - 500+ acres**	**2-20 acres**

Note: This table includes crypto mining which often behaves differently than other data centers in that it can ramp electricity use up or down more easily, some local jurisdictions include crypto mining along with other data centers and others explicitly differentiate.

A small enterprise facility may look like another commercial building with added electrical needs. A hyperscale or artificial intelligence (AI) campus may use electricity equivalent to a city, with larger land use, power, cooling, and backup-power questions. Crypto mining is different again because operators may be more willing to shut down when electricity prices are high or the grid is stressed.

Other definitions of data centers focus on ownership or use of the facility. For example, a **colocation data center** refers to situations where a company owns and operates a data center, but rents space in that data center to other users. Contracts between the owner and users in a colocation facility detail the services agreed to, including space, power, cooling, and security. The ownership and use model – and whether a local government is directly interacting with the end user – may influence development agreements and negotiations over transparency of resource use.

Data Centers: A Guide to Common Questions

Adapted with permission from Penn State Extension. June 5, 2026

Communities across the country are being asked to consider data center development proposals that involve complex decisions related to land use, energy systems, water resources, infrastructure capacity, and long-term economic development. **Data Centers: A Guide to Common Questions** is designed to help communities engage in informed, transparent, and respectful conversations about proposed data center development. It is not intended to advocate for or oppose any specific project. Instead, it provides a structured set of questions communities may consider when evaluating proposals in the context of local priorities, land-use planning, infrastructure capacity, and long-term resilience.

The questions included here are meant to encourage thoughtful evaluation and fact-based discussion among local officials, residents, businesses, industry, and other stakeholders. Because each community and each project is different, the checklist should be viewed as a starting point rather than a complete list of considerations. Communities should adapt or expand these questions to reflect local conditions, policies, and priorities.

Power/Electricity

Power Demand and Source

1. What is the total estimated power demand (MW or GW) per year (0-5 years, 6-10 years, 11-20 years, and 21 years and beyond)?
2. Where will the power come from: grid, onsite generation, or both at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond?
3. If onsite generation is used:
    - What source will be used (e.g., natural gas, diesel/oil, renewables, jet turbines, small modular nuclear [currently projected by 2035], etc.)?
    - Is it planned for initial development or future phases?
4. How does this project's estimated energy demand compare to other large regional loads (existing or planned)?
5. What percentage of the total regional energy demand will the project represent at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond?

Infrastructure and Capacity

1. Are new substations, transmission lines, or grid upgrades required?
2. What power infrastructure will be located onsite?
    - Who is responsible for capital and long-term maintenance costs?
    - How will this project affect local and regional grid capacity and availability for other users at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond?

Power Reliability and Operations

1. How will the facility operate during:
    - Power interruptions (backup generation type, duration, testing frequency)?
    - Periods of high demand or grid stress/ fragility?

Cost and Rate Impacts

1. How will this project impact electricity rates for:
    - Residential customers at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond (increase vs decrease)?
    - Commercial and industrial customers at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond (increase vs decrease)?

What is the projected Power Usage Effectiveness (PUE)?

1. PUE = total power supplied to a facility divided by the power used to run IT equipment within the facility (lower scores are generally reflective of greater efficiency).
2. Does the estimate reflect real-world operating conditions or ideal design targets?

Water

Water Demand and Sourcing

1. What are the projected peak, average daily, and seasonal water needs for cooling, humidification, and other activities, including landscape irrigation or wastewater treatment, at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond?
2. What is the water source (existing municipal provider, new well(s), surface water, combination of sources, other)?
3. Is non-potable water use an option?
    - Type of non-potable water - reclaimed wastewater on site or other industry, harvested rain water, saltwater, brackish groundwater, treated effluent, other?
    - If so, does it require pre-treatment?
4. Has an independent water feasibility study been completed to investigate how the project compares with other local and regional large water users; if adequate local water supply exists; and identify local private wells and natural watercourses that may be impacted negatively?

Water System Impact and Planning

1. Is a watershed or regional capacity analysis needed or completed?
2. What is the estimated total water use, including both:
    - On-site water use (direct use) needs at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond?
    - Water used for electricity generation, indirect use needs at 0-5 years, 6-10 years, 11-20 years, and 21 years and beyond?
    - Water used for wastewater treatment?
3. What portion of withdrawn water is consumptive (lost to evaporation)?
4. How will the facility operate during drought or water-restricted conditions?
5. How does the project compare with other major water users in the area or region (e.g., brewery, power generation, food processor, etc.)?

Cooling and Water Use Design

1. What cooling approach is proposed (i.e., air-cooled, closed-loop, evaporative/open-loop, hybrid, other)?
2. How will the cooling system selected affect:
    - Water needs?
    - Wastewater discharge volume?
    - Wastewater discharge temperature?
    - Energy demand (i.e., more on-site air cooling to reduce direct water needs, but likely results in increased indirect water consumption by increasing demand for electricity produced by geothermal power plants)?
3. What is the data center's projected Water Usage Effectiveness (WUE)?
    - WUE = total water used for cooling (liters) divided by the total energy consumed by the IT equipment (kWh).
    - Does it include both potable and non-potable sources?
4. What improvements could be made to cooling systems to reduce water use over time?

Water Quality, Discharge, and Treatment Infrastructure

1. What water treatment (pre- and post-use) may be needed?
2. What is the expected quality of any discharged water, including:
    - Volume
    - Temperature
    - Composition (i.e., salts, minerals, biocides, corrosion inhibitors, etc.)?
3. What are the cumulative discharge impacts, including interactions with other users (i.e., discharge for the data center alone or combined with other major industries)?
4. Will upgrades to water or wastewater infrastructure be required? If so, who pays?
5. Will real-time monitoring of water flows and quality be implemented (i.e., installing sensors to continuously monitor for leaks and key water characteristics such as pH, Total Dissolved Solids, other, etc.)?
6. What, if any, water reclamation or reuse strategies are planned?

Water Regulation and Transparency

1. Who, if anyone, regulates water withdrawal and discharge in the area, and what permits (if any) are required?
2. What are the opportunities for public input if a new water withdrawal permit or registration is required?
3. What is the process and timeline for public input?

Private Water Supply Systems and Nearby Water Sources

1. For nearby private water sources (wells, springs):
    - Will third-party testing be conducted pre-, post-, and long-term (quality and volume)?
    - What is the testing radius from the facility and/or withdrawal points?
    - What plans are in place to address and remediate impacts to water flow, quality, or volume?

Domestic Water and Sewer Systems

1. For nearby domestic water sources (wells, springs, reservoirs):
    - Will third-party testing be conducted pre-, post-, and long-term (quality and volume)?
    - What is the testing radius from the facility and/or withdrawal points?
    - What plans are in place to address and remediate impacts to groundwater recharge, quality, or volume?
2. How will the project impact water and sewer rates for:
    - Residential users (short-term vs long-term and increase vs decrease)?
    - Commercial users (short-term vs long-term and increase vs decrease)?

Broadband Infrastructure and Capacity

1. Proximity to existing fiber infrastructure, or is there a need for new installation?
    - What is the required capacity and size of fiber optic cabling?
    - What level of redundancy and resilience is planned for the network?
    - What are the potential impacts on or benefits to local broadband capacity and access?
2. Will the fiber optic cable network need to be expanded or upgraded?
    - Aerial fiber vs underground (trenching) installation or both?
    - What distance will fiber-optic cable need to be run?
    - Other broadband supporting infrastructure needed?

Land Use

Site Suitability and Compatibility

1. What is the site's proximity to power, water, fiber infrastructure, residential neighbors, or other sensitive zoning or environmental locations?
2. How much land is required, and is it compatible with surrounding uses?
3. What are the visual, lighting, and noise impacts on nearby properties?
4. Long-term compatibility with adjacent land uses?
5. Does this development limit future land-use flexibility or alternative economic uses?

Natural Hazards and Environmental Conditions

1. Are there flood, wildfire, or other natural hazard risks?
2. What are the erosion and sedimentation control plans?
3. Stormwater mitigation and management plans?

Land Preservation and Policy

1. Conservation programs' impacts?
2. Agricultural Security Areas impacted?
3. Farmland preservation easements impacted?
4. Tax abatement programs (e.g., Clean and Green) impacted?

Workforce/Jobs

Preconstruction

1. How many full-time equivalent (FTEs) jobs?
2. What are the key occupation groups and average anticipated salaries?
3. Will local contractors or suppliers be used?

Construction

1. How many jobs (FTEs)?
2. Anticipated construction duration?
3. Will local contractors or suppliers be used?
4. What is the ratio of temporary (construction) vs permanent (operational) jobs?

Post Construction/Operations

1. Onsite
   - How many jobs will be onsite full-time (FTEs)?
   - What are the key occupation groups and average anticipated salaries?
   - Will local contractors or suppliers be used?
   - Are the full-time jobs contracted services or direct hire employees?
2. Regional (serving multiple data centers in a region)
   - How many jobs will be regionally full-time (FTE's)?
   - Will regional contractors or suppliers be used?
   - Are the full-time jobs contracted services or direct hire employees?
   - What are the key occupation groups and average anticipated salaries?
3. Workforce development or training partnerships, if any?

Zoning and Permitting

Zoning and Land Use Framework

1. Is the current zoning appropriate for the use, scale, and intensity of use?
2. Does the zoning framework account for long-term operational intensity (24/7 use, future expansion, technology changes)?
3. Will data centers be permitted by right, conditional use, or special exception in each zoning district?
4. Is an overlay district needed to account for the specific land-use needs and community interests of a data center?
5. Is separation from residential or high-value areas (i.e., parks and recreation areas, environmentally sensitive areas, etc.) possible?

Permits, Conditions, and Enforcement

1. What commitments are enforceable versus aspirational?
2. How will compliance with permits and conditions be monitored/enforced?
3. What triggers will require new approvals if the facility expands or changes (e.g., expansion, technology changes, power or cooling system changes, increased use of power or water, etc.)?

Site Impacts: Noise, Lighting, and Viewshed

1. Lighting considerations (height, intensity, duration, shielding, etc.)
2. Noise considerations
   - Power generation and back-up power generation
   - Fans, chillers, and other cooling equipment
   - Low to mid-frequency noise?
3. Noise and lighting mitigation strategies?
4. Viewshed impacts and potential effects on community character?

Traffic and Local Infrastructure

1. What are the expected traffic impacts during construction and operation, potentially including:
   - Delivery schedules and peak traffic periods?
   - Peak onsite construction workforce (number of people onsite)?
   - Peak onsite operational workforce (number of people onsite)?
   - Construction truck types, routes, and loads?
   - Potential conflicts with school routes or local traffic patterns?

Infrastructure Planning

1. Established road weight limits?
2. Road wear and bonding requirements for local roads?
3. Emergency services access and response?

Home Values

1. Are there peer-reviewed studies, assessor data, or comparable community case studies?
2. What site-specific factors might influence nearby property values?
3. How could changes in property values affect the local tax base and residents?

Policy, Taxes, and Incentives

Strategic Alignment and Community Fit

1. Does the project align with long-term economic development goals and community priorities?
2. How does this project compare to similar data centers in:
   - Water use (WUE)
   - Energy use (PUE)
   - Carbon use (CUE)
   - Jobs created
   - Anticipated tax benefits or challenges?

Incentives and Public Investment

1. What incentives are being requested (e.g., LERTA - Local Economic Revitalization Tax Assistance or other tax abatements), and what are the eligibility criteria?
2. What are the projected net fiscal impact for the community over 5, 10, 20, and 30 years (expected revenue and anticipated public expenses/costs)?
3. What assumptions are used in fiscal impact projections, and can they be independently reviewed or verified?

Infrastructure Costs and Cost Allocation

1. What public infrastructure upgrades are required (power, water, roads, school expansion, emergency services, hospitality services, rental property, etc.)?
2. How will public infrastructure costs be allocated?
   - Directly funded by the developer?
   - Recovered through utility rates?
   - Funded by taxpayers?
   - What safeguards or binding agreements to prevent future cost shifting?

Community Benefits and Agreements

1. Is a Community Benefit Agreement (CBA) being considered?
   - What investment or benefits are proposed, beyond local tax revenue?
   - What commitments are enforceable?
2. Who are the community stakeholders involved in negotiating the CBA, and how will they be selected?

Economic Impact Reports

1. What specific impacts does the report measure (e.g., jobs, income, tax revenue, output)?
2. Does the report distinguish between direct, indirect, and induced impacts?
3. What geographic area is analyzed (local, county, regional, state)?
4. What assumptions are made about: construction spending and timeline; operational spending and staffing levels; worker residency (local vs. non-local)?
5. How are jobs defined and counted (FTE vs. headcount)?
6. Does the report account for job leakage (workers commuting from outside the area)?
7. Does the report distinguish between gross economic impact and net fiscal impact?
8. Has the report been independently reviewed or validated, and are full methodologies, data sources, and assumptions publicly available?

Environment and Climate

Emissions and Energy

1. What backup power sources are used, and what are the emissions implications?
2. What are the project's overall climate carbon footprint implications?
3. What is the projected Carbon Usage Effectiveness (CUE) score?
   - CUE = total carbon dioxide emissions (kg CO2e) divided by total IT energy (kWh)

Stormwater and Wastewater

1. Plans for water sourcing, efficiency, and reclamation?
2. How are stormwater and wastewater to be managed?

Heat Management

1. How will waste heat be managed?
2. Can waste heat be reused for a beneficial community or business purpose?

Monitoring, Air Quality, and Operations

1. Anticipated air quality implications or impacts and monitoring?
2. What environmental monitoring and reporting commitments will be in place?
3. Are there seasonal or drought-related operational changes that affect environmental impacts?

Additional Considerations

Emergency Preparedness and Operations

1. What is the emergency response plan?
2. How does the emergency response plan integrate with local emergency services?
3. What are the anticipated facility upgrade cycles or timelines (CPUs, GPUs, battery backup, cooling, etc.), and should or do they trigger additional review of the response plan?

Transparency and Community Engagement

1. What commitments exist for transparency and ongoing communication with the community?
2. Is there a designated point of contact for community questions or concerns?
3. Can the community independently verify projected resource use and reported impacts?
4. Are there additional considerations or project-specific issues that should be addressed?

Lifecycle and Long-Term Operation

1. What are the plans for end-of-life management, including equipment, batteries, infrastructure, and site remediation/ restoration?
2. What mechanisms allow the community to revisit or renegotiate terms if impacts differ from projections?

Community Readiness for Data Center Conversations

Large infrastructure projects, such as data centers, often involve complex decisions regarding land use, energy systems, water resources, infrastructure capacity, and long-term economic development. Communities may benefit from adopting a structured, transparent approach before making decisions. The following considerations may help local leaders organize conversations, gather reliable information, and ensure decisions align with long-term community priorities and values.

Clarify Community Goals: Before evaluating a proposal, communities may want to reflect on broader priorities.

1. Does the proposal align with existing comprehensive plans or economic development strategies?
2. How does the project fit with long-term land-use goals for the area?
3. Are there local priorities related to agriculture, natural resources, housing, or quality of life that should be considered?

Review Local Zoning and Land-Use Frameworks Early: Zoning and land-use policies often determine where large infrastructure projects can be located and what conditions apply to development. Communities may benefit from reviewing their zoning ordinances and planning even before receiving a proposal for a data center project.

1. Is data center development currently permitted or restricted within an existing zoning ordinance? If permitted, in which zoning districts and under what conditions?
2. Does the scale of modern data centers align with existing zoning assumptions for industrial or commercial development?
3. Does zoning differentiate between different types and sizes of data centers?
   - Hyperscale
   - Cloud services
   - Enterprise
   - Edge
   - Cryptocurrency
4. Are there municipalities that may be interested in opting into a county's zoning ordinance or forming a joint municipal zoning ordinance?
5. Are there setback, noise (including low-frequency), lighting, or buffering standards that may apply?
6. Would special use permits, conditional use approvals, or zoning amendments be required?
7. Are there opportunities to clarify expectations or performance standards before development proposals are received?

Identify Key Stakeholders Early: Early engagement may help ensure a balanced understanding of opportunities and concerns. Stakeholders might include:

1. Local elected officials and planning staff
2. Electric utilities and grid operators
3. Water authorities and watershed organizations
4. Emergency services and public safety officials
5. Economic development organizations
6. Local businesses and workforce training providers
7. Farmers, landowners, and nearby residents
8. Environmental or natural resource organizations
9. Concerned citizens

Including diverse perspectives early may improve communication, build trust, and reduce misunderstandings later.

Encourage Open and Transparent Communication: Public trust is usually strengthened when discussions are visible and accessible. Communities may wish to consider:

1. Holding public meetings or informational sessions
2. Providing clear summaries of proposals and supporting materials
3. Offering opportunities for residents to ask questions and provide input
4. Identify a designated point of contact for ongoing communication
5. How will elected officials or economic development professionals handle potential project non-disclosure agreements (NDAs) and transparency?
    - What data will always be disclosed to the public (e.g., water and energy needs/consumption, water treatment, total costs, community costs, etc.)?
    - Can the community independently verify projected resource use?
6. Transparency does not require immediate decisions; it helps ensure decisions are well understood, even if there is disagreement

Seek Reliable and Independent Information: Data center proposals often include technical claims related to energy use, water consumption, job creation, economic development, tax revenue and incentives, and environmental impacts. Communities may benefit from reviewing independent information alongside developer materials. Possible sources of information might include:

1. Universities
2. Regional planning organizations
3. Utility providers
4. State regulatory agencies (i.e., Department of Environmental Protection permit reports, River-basin/ watershed reports, etc.)
5. Credible professional engineering or environmental experts
6. Testimony from other community experiences
7. Reliable information can help focus discussions on facts rather than speculation

Coordinate Across Jurisdictions When Needed: Some impacts of large infrastructure projects extend beyond a single municipality. Coordination may be helpful when proposals affect:

1. Regional power infrastructure or transmission upgrades
2. Shared water resources or watershed systems
3. Transportation networks or emergency services
4. Workforce development and regional economic planning
5. Emergency services
6. Schools and School Districts

Plan for Monitoring and Long-Term Accountability: Community conversations may also include how commitments will be tracked over time. Topics to consider might include:

1. How will permit conditions and community commitments be monitored?
    - What reporting frequency is required (monthly, annual)?
    - Who verifies compliance?
    - What penalties exist for non-compliance?
2. What reporting or transparency mechanisms may be appropriate?
3. What review processes are triggered if the facility expands or operational conditions change?
4. Planning for long-term accountability helps communities adapt as proposals, technologies, and facilities evolve.

NDSU Extension Leadership and Civic Engagement
Jodi Bruns, Leadership and Civic Engagement Specialist

NDSU Extension does not endorse commercial products or companies even though reference may be made to tradenames, trademarks or service names.

For more information on this and other topics, see www.ndsu.edu/extension

North Dakota State University is an equal opportunity educator and employer. NDSU Extension and the Agricultural Experiment Station's work is supported by the U.S. Department of Agriculture's National Institute of Food and Agriculture. USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity. NDSU Extension and the NDAES are committed to providing equal access. Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language) or other disability-related accommodations may request them at 701-231-1865. Advanced notice of two weeks is preferred to allow for adequate planning. web-11-26