COLORADO
Office of Economic Development & International Trade

Colorado Data Center FAQ

As demand for digital infrastructure grows, many communities are being approached by developers interested in building data centers. This FAQ is designed for local leaders including elected officials, planners, and economic development professionals. It provides information on what data centers are, how they operate, and the types of requirements and considerations they typically involve.

What is a Data Center

A data center is a facility that houses powerful computer systems and related infrastructure used to store, process, and transmit digital information. These facilities contain servers, data storage systems, networking equipment, and supporting infrastructure such as power infrastructure and cooling systems. This power infrastructure may include onsite or adjacent power generation and transmission infrastructure in addition to backup generation. Data centers enable a wide range of everyday digital services, including cloud computing, online applications, video streaming, financial transactions, and data storage for businesses and individuals.

Data centers are located across the United States and globally, with higher concentrations in regions that offer strong connectivity, reliable power infrastructure, and access to major markets. In the U.S., major data center hubs include Northern Virginia, Texas, California, Illinois, Ohio, Arizona, Georgia and the Pacific Northwest, while activity is also growing in the Mountain West, including Colorado.

Why are Data Centers Being Built

Data centers are being built to support the growing demand for digital services and data processing. As more activities—such as business operations, communication, entertainment, and emerging technologies like artificial intelligence—rely on digital infrastructure, additional capacity is needed.

In many cases, data centers are built as dedicated facilities rather than within existing buildings because they have specific requirements, including:

- High and reliable power supply to support continuous operation
- Specialized cooling systems to manage heat generated by equipment
- Physical space and layout designed for large amounts of hardware
- Security and redundancy measures to ensure uptime and data protection
- Connectivity infrastructure for high-speed data transmission
- Onsite backup generation and fuel storage

These requirements are often difficult to accommodate in standard commercial or industrial buildings, leading developers to construct purpose-built facilities.

Main Types of Data Centers

Enterprise Data Centers

An enterprise data center is a private facility used by a single organization, typically custom-built to support its specific applications and operations. It can be located on-site or off-site, depending on needs like connectivity, security, or energy efficiency. The IT team usually manages the IT equipment, while supporting infrastructure may be handled internally or outsourced. Companies that operate enterprise data centers include AT&T, Bank of America, ExxonMobil and Coca Cola.

Colocation Data Centers

Multi-tenant or colocation data centers provide shared facilities where businesses can house their servers without building or managing their own infrastructure. Companies offering this type of data center for companies include Digital Realty, Equinix, and QTS.

Hyperscale Data Centers

Hyperscale data centers are campuses consisting of multiple buildings built for large-scale computing and storage, housing thousands of servers and enabling near-unlimited scalability. Amazon, Microsoft, and Google account for more than half of all hyperscale data centers – they are crucial for these companies to train and run large AI models. Additionally, hyperscale data centers allow these companies to store and manage vast amounts of data that users access via the cloud.

Edge or Micro Data Centers

These types of data centers are smaller facilities located close to end users, enabling faster data processing and reduced latency. They are increasingly important for supporting technologies like IoT (Internet of Things), AI, and streaming as connected devices continue to grow.

Modular or Container Data Centers

These data centers are portable, plug-and-play units – often in a shipping container – equipped with servers, storage, and cooling. It enables quick deployment and flexible scaling, commonly used for temporary needs or to expand capacity in permanent settings.

Data Center Components

Data centers are made up of several key components that work together to store, process, and transmit data. While the technology inside can be complex, these components can be grouped into a few main categories:

- *Servers:* Servers are the core computing units that process data and run applications, such as websites, software, and cloud services
- *Storage Systems:* Storage systems hold and manage large volumes of digital data so it can be accessed and used when needed
- *Networking Equipment:* Networking equipment connects servers and storage systems to each other and to external networks, enabling data to move between users, applications, and locations
- *Power Infrastructure:* Power infrastructure supplies reliable electricity to the facility, often at a large scale. This can include grid connections, substations, onsite power generation and transmission, and backup power systems with fuel storage to ensure continuous operation
- *Cooling Systems:* Cooling systems remove heat generated by equipment to keep servers operating efficiently and prevent overheating. The type of cooling system used can influence a facility's water and energy use
- *Security Systems:* Security systems protect the facility and its data, including physical security measures (such as controlled access and surveillance) as well as digital protections

Among these components, power and cooling systems are often of interest to local communities, as they can influence electricity demand, water use, and infrastructure requirements. Noise is also a growing area of interest among communities located near hyperscale development.

Data Center Project Requirements

When a company or developer is looking to build a new data center, they often send a Request for Information (RFI) to state or local Economic Development Organizations to scout potential locations. Companies often look for sites that can provide sufficient power capacity, or where utilities have a clear and feasible plan to deliver it, within a predictable and timely timeframe. However, data centers are increasingly considering projects that involve constructing onsite generation in areas where connecting to the grid may not be feasible within the desired project timeframe. If a community chooses to respond to an RFI, it is important to engage the local utility provider early in the process to clarify capacity, timelines, any required infrastructure upgrades and who will bear the costs for those upgrades.

Typical Project Parameters For Data Center RFIs

Power Availability & Reliability	**Connectivity**	**Site Physical Characteristics**	**Incentives & Cost Factors**
● **Current power availability on site: large-load data centers typically require at least 20 MW+ (single facility) or 60 MW+ (campus)** ● **Predictable timeline to access power and ability to scale capacity over time** ● Redundancy (e.g., two or more independent substations) ● Available power sources, including renewable energy	● Access to major high-capacity fiber networks that carry data across regions ● Location near major internet hubs that enable fast and efficient data transfer ● Multiple, physically separate fiber connections to ensure redundancy	● **Acreage: ~100–500+ acres for hyperscale data centers; ~5–20 acres for smaller facilities** ● Sites that can accommodate setbacks (often ~500 ft) to address noise, safety, and visual impacts ● Sites with low risk of natural hazards and ability to support continuous operations during extreme weather	● State incentives ● Local incentives and property tax structure or potential abatements ● Electricity rates, including potential large-user or economic development tariffs ● Costs for additional infrastructure if needed ● Access to workforce (FTE requirements typically low)

Power Availability & Reliability	Connectivity	Site Physical Characteristics	Incentives & Cost Factors
options ● Backup generation, typically in the form of diesel generators.		events ● Industrial zoning or data center specific use ● **Water availability for cooling systems** ● Proximity to major infrastructure (e.g., airports, highways)	

Economic Impacts

Data centers can offer a variety of benefits for local communities, including tax revenue, job creation, and social and infrastructure investments.

Tax Revenue Benefits

Data centers are highly capital-intensive facilities, with a large share of their value tied to servers and IT equipment rather than the building itself. In many cases, the value of this equipment can equal or exceed the cost of the building, and it is replaced or upgraded on a regular cycle. This can translate into multiple sources of local tax revenue, including property taxes on both the building and equipment, as well as sales and use tax from ongoing equipment purchases, depending on local tax structure. Because equipment is updated over time, these facilities can generate recurring taxable investment rather than a one-time build-out.

Project costs can vary significantly depending on size and design. For example, Meta has estimated its data center campus in El Paso, Texas at approximately $10 billion, while one of Colorado's larger data center projects has been reported at around $192 million.

Depending on local tax policy and any incentives offered, the net fiscal impact can vary. Some communities offer tax incentives or reduce certain tax rates to attract data center investment, which can influence overall revenue outcomes. At the same time, data centers often generate tax revenue with comparatively lower demand on public services, such as schools or traffic infrastructure, due to their relatively small on-site workforce.

Investment in Renewable Energy and Sustainability

Large-scale data centers are significant electricity consumers and often enter into long-term power purchase agreements (PPAs) to secure energy supply. In some cases, these agreements can support the development of new renewable energy projects, such as solar and wind, by providing a stable, long-term customer for that power.

Through these arrangements, data centers can contribute to the expansion of renewable energy capacity on the grid, depending on the utility structure and market conditions. Many operators also set internal sustainability targets related to energy use and emissions, which can influence how electricity is sourced over time.

In addition, some facilities incorporate technologies such as energy storage or load management systems. These systems can help balance electricity demand and supply, particularly when integrating intermittent renewable energy sources, and may contribute to overall grid stability depending on how they are deployed.

Job Creation

Data centers typically have a relatively small on-site workforce compared to other developments of similar scale. Permanent roles often include facility operations, maintenance, security, and IT support. During construction, data centers can employ a large temporary workforce—often hundreds to thousands of workers depending on project size—but these jobs typically conclude once the facility becomes operational.

Once operational, employment levels are significantly lower. Estimates suggest that a data center may employ on average a few dozen workers per 100 megawatts of capacity, highlighting the relatively low number of permanent jobs compared to the scale of investment.

Data center roles vary in skill level and compensation, ranging from entry-level support roles to specialized technical and engineering positions, with wages in some markets exceeding average private sector pay.

In addition to direct employment, data centers can support indirect economic activity in the surrounding region. This may include demand for professional services, specialized contractors, and technical support. Periodic equipment upgrades and maintenance activities can also generate ongoing work for trades such as electricians, HVAC technicians, and construction firms.

Infrastructure and Connectivity:
Data centers require significant infrastructure, including high-capacity fiber connectivity and reliable power supply. In some cases, this can lead to investments in telecommunications and electrical infrastructure, such as fiber networks, substations, and transmission upgrades. Depending on the project and provider, these investments may also support broader network expansion or improve system reliability. In some instances, increased fiber capacity can contribute to improved connectivity for nearby businesses or communities, although the extent of these benefits varies by project and network design.

Community Engagement and STEM Education:
Data center operators may engage with local communities through partnerships, workforce development programs, and philanthropic activities. These can include collaboration with community colleges or schools on technical training, certifications, or career pathways related to IT and facility operations.

Some operators also support local organizations through grants or sponsorships, which can vary in scope and duration. In the case of colocation facilities, businesses may gain access to high-quality digital infrastructure without needing to build and operate their own data center, depending on market availability and pricing.

Questions for Developers

- Jobs & Workforce
    - How many permanent on-site jobs will be created, and what types of roles are expected?
    - What is the expected salary range for these roles?
    - What portion of jobs will be sourced locally?

    - Are there workforce development partnerships with local institutions or training programs?
- Community Benefits
    - Are there community benefit agreements or formal commitments tied to the project? If yes, are these structured as ongoing or as one-time contributions?
- Tax & Fiscal Impact
    - What are the projected property tax, sales tax, and use tax contributions?
    - How will equipment depreciation affect long-term tax revenue?
    - Is there a minimum tax or PILT (Payments in Lieu of Taxes) structure to stabilize revenue over time?

Impacts on Electricity

Electricity Demand

Data centers require large and continuous amounts of electricity. For communities, a single project can represent a notable portion of local or regional demand, which utilities consider when planning capacity and future infrastructure needs.

Electricity Demand Comparison

According to the U.S. Energy Information Administration (EIA), the average U.S. household uses about 10,800 kWh of electricity per year, equivalent to a continuous load of roughly 1.2 kW. Home equivalents in this table are based on average annual electricity consumption. However, residential demand varies throughout the day, while data centers operate at a constant 24/7 load, so grid impacts are not directly comparable.

Facility Type	Typical Load (MW)	Equivalent Homes
Single Family Homes	~0.0012 MW (1.2 kW)	1 home
Residential Neighborhood	~2-5 MW	~1700-4,200 homes
Warehouse	~2-5 MW	~1700-4,200 homes

Facility Type	Typical Load (MW)	Equivalent Homes
Retail / Big Box	~1-3 MW	~800-2,500 homes
Commercial Office	~2-5 MW	1700-4,200 homes
Industrial Facility	~5-20 MW	~ 4,200-16,700 homes
Data Center (Single Facility)	**~20-100+ MW**	**16,700-83,000+ homes**
Data Center Campus	**100 MW – 1 GW+**	**83,000-830,000+ homes**

Infrastructure Requirements and Timelines

Projects of this scale often require new substations, transmission lines, or upgrades to the local distribution system. Timelines can therefore extend over multiple years, reflecting planning, construction, and current lead times for key electrical equipment, which may take several years from order to delivery.

Grid Capacity and Reliability

Utilities review whether the grid can support large new electricity users while maintaining reliable service. This usually includes technical studies, which can take several months to multiple years to complete. In some cases, projects may start with a smaller amount of power and increase over time. Full power use may only be available once required upgrades are completed. Many data centers also have more than one connection to the grid to help maintain service if one line is interrupted.

Because data centers typically operate 24/7, they create a steady demand for electricity. For utilities, this can influence how generation is planned and how peak demand is managed. For communities, it may affect how additional capacity is developed and the timing of new projects, as multiple developments may need to be coordinated over time to align with available power.

Cost Allocation

A key consideration is who pays for the power infrastructure upgrades required to support data center projects. Depending on the structure of the project and applicable regulations, costs may be borne by the developer, the utility, or partially passed on through broader rate structures. This can be an important factor for local stakeholders to understand early in the process.

Xcel Energy has proposed a new framework to manage large electricity users, such as data centers. The proposal is designed to ensure that new, high-energy users cover the costs associated with serving them, rather than shifting those costs to existing residential and commercial customers. This includes a “large load tariff,” which would apply to facilities with very high electricity demand. The overall goal is to accommodate growing demand while maintaining reliable service and limiting cost impacts for existing customers. Under this approach, these customers may be required to:

- Pay for new infrastructure needed to serve their project (e.g., transmission, substations)
- Commit to long-term contracts and minimum usage levels
- Provide financial assurances to support system planning and reliability

Energy Sourcing

Meeting the electricity demand of large projects may require utilities to add new energy supply over time, such as building new power plants, expanding renewable energy generation, or purchasing power from other sources. Depending on how this demand is met, it can influence the overall energy mix on the grid and how projects align with state or local clean energy and emissions goals.

Meeting the electricity demand may also include on-site energy storage and/or backup gas or diesel generators. This power is “behind the meter” and is owned by the data center, not the utility.

Questions for Developers & Utilities

- What is the expected peak and average electricity demand of the facility?
- What new infrastructure (e.g., substations, transmission lines) will be required, and what is the timeline?
- Who is responsible for funding grid upgrades and interconnection costs?
- Will the facility require redundant power feeds, and how will those be designed?
- How will the project affect local grid capacity for other users and future development?
- What is the facility’s energy sourcing strategy (e.g., grid mix, renewables)?
- Does the project include on-site energy storage, and if so, how will it be used?

- Are there plans to support grid stability (e.g., peak shaving, demand response)?
    - Is reliance on backup diesel generation permissible as part of those grid stability programs?
    - How much demand flexibility will the facility have to reduce demand during peak hours on specific days?
- How does the project align with state or local emissions and energy goals?

Impacts on Air Quality

Multiple factors influence how a data center could impact air quality, including size, location, and sources of primary and backup power. Local leaders should encourage data center developers to engage with the Colorado Department of Public Health and Environment (CDPHE) Air Pollution Control Division (APCD) early on in the planning process. Early engagement is critical to allow developers to consider air quality requirements during the planning process and ensure sufficient time is built into the schedule to secure required permits. For example, a data center project located in Colorado's ozone nonattainment area will need to comply with more stringent air quality requirements than a project located outside the nonattainment area. The size of the project also matters. Hyperscale data center projects could trigger more stringent major source permitting requirements regardless of whether they are located in the ozone nonattainment area. If the project has onsite or co-located primary generation in addition to backup diesel generation, all of those emission points may need to be considered together and included in a single source air permit.

Additionally, project developers should consider whether the data center is located in a disproportionately impacted community already impacted by multiple sources of pollution. APCD has additional engagement and permitting requirements for sources located in disproportionately impacted communities. Engagement with APCD to consider community impacts and air quality permitting requirements early on in the project planning process is critical.

Impacts on Water

Data centers can place additional demand on local water resources, particularly in arid or water-constrained regions. The level of water use varies depending on cooling technology, facility design, and local climate conditions, and are an important consideration for communities evaluating these projects.

Cooling Technologies

“Open-loop (evaporative) systems” use water to cool air through evaporation and can require significant volumes of water, depending on facility size and climate. “Closed-loop systems” on the other hand recirculate water or coolant with limited loss, generally reducing water use but often increasing electricity demand for cooling. Emerging technologies, such as “liquid-to-chip”, a cooling method where liquid coolant is delivered directly to components through cold plates attached to the chips, removing heat more efficiently than traditional air cooling, or “air-cooled systems”, aim to further reduce water consumption.

Water Rights

In some cases, water rights associated with agricultural land may be transferred to support industrial uses, including data centers. This can lead to changes in land and water use patterns over time, as well as potential indirect effects on agricultural activity and related services. In arid regions, developers may acquire agricultural land associated with senior water rights and transfer those rights to support data center operations (often referred to as “buy-and-dry”). Some Colorado jurisdictions have begun to reference “Water Usage Effectiveness (WUE)” targets and may encourage the use of lower-water cooling technologies to help manage water demand.

Questions for Developers

- What type of cooling technology will be used (e.g., evaporative, closed-loop, air-cooled, liquid-to-chip), and how does that influence expected water use?
- What is the projected annual water consumption under typical and peak operating conditions?
- How will water sourcing affect existing users, including agriculture or municipal supply?
- How does the project plan to manage water use in drought conditions or periods of water constraint?

- Are there opportunities to reduce potable water use (e.g., recycled water, alternative sources)?
- Does the project include any water offset, reuse, or efficiency investments in the local community?
- Has a Water Usage Effectiveness (WUE) target been defined?

Impacts on Land Use & Wildlife

Land Conversion and Compatibility with Surrounding Uses

Data centers are typically developed on agricultural, industrial, or undeveloped land and represent a long-term industrial use. Depending on the location, this may change how land is used within the project area and how it relates to surrounding properties. In agricultural areas, this can include a shift away from active production.

Large projects may also be one of several factors that influence local land values and development patterns over time, depending on market conditions. Practical considerations often include site access, construction and operational traffic, visual screening, and how the project fits with existing land uses and community plans.

Wildlife Movement and Fencing

Large buildings, security fencing, and associated infrastructure can affect how wildlife move across a landscape, particularly near known migration or movement corridors. Fencing design and site layout can influence whether wildlife movement is restricted or maintained. State and federal guidance generally emphasizes maintaining habitat connectivity where feasible.

Lighting and Noise

Data centers typically operate around the clock and often include exterior security lighting. Artificial light at night can affect surrounding conditions, including wildlife behavior and nocturnal pollinators, and it can alter pollination and broader ecosystem functioning. Local governments may want to evaluate whether a project uses shielded fixtures, limits light spill, and follows dark-sky or similar lighting standards where applicable. Operational noise is another land-use compatibility issue.

Additionally, cooling equipment, mechanical systems, and periodic backup generator testing can create ongoing or intermittent noise. This noise may affect nearby land uses, including residential areas or agricultural operations, and in some cases may also influence wildlife behavior.

Heat, site design, and landscaping

Data centers generate heat as a byproduct of continuous operations and release it through cooling systems. Depending on facility size, design, and climate, this can contribute to localized temperature increases near the site. Site design elements, such as building layout, setbacks, drainage, and landscaping, are used to manage heat, stormwater, and visual integration.

Operational and Infrastructure Considerations

Data centers require supporting infrastructure such as power lines, substations, and fiber connections. In agricultural areas, the placement and depth of underground infrastructure can be relevant, as it may affect activities such as deep tilling or the use of heavy equipment.

Questions for Developers

- How does the project site selection affect existing land uses, including agriculture or open space?
- How will the project interact with nearby agricultural operations?
- What assessments have been conducted regarding wildlife movement and habitat connectivity?
- How will fencing and site design account for wildlife corridors or migration patterns?
- What lighting design will be used, and how will light spill be minimized?
- What are the expected noise levels during operations and generator testing and what is the testing schedule (time of day and frequency)?
- How will noise impacts be assessed and mitigated for nearby properties or agricultural uses?
- What site design features (setbacks, landscaping, screening, buffers) are included to reduce visual and environmental impacts?
- How will heat generated by the facility be managed, and are there localized microclimate considerations?

- Are there opportunities to reuse waste heat for nearby facilities or community uses?
- Will infrastructure placement (including underground utilities) affect agricultural practices such as deep tilling or equipment use?
- Are there opportunities for dual-use land strategies (e.g., agrivoltaics), where applicable?
- What strategies are in place to reduce the project's overall environmental footprint?

Recommended Partners to Support Community Decision Making

Communities should engage a range of trusted partners to help inform and guide their decision-making process, including:

- *Colorado Office of Economic Development and International Trade (OEDIT):*
  OEDIT staff provides insight into state-level programs and how the project aligns with Colorado's broader economic development strategy
- *Regional Economic Development Organizations*:
  Groups such as Metro Denver EDC, Region 9, Region 10, or GJEP can offer regional context, benchmarking data, and experience from similar projects across Colorado communities
- *Local Utility Providers:*
  Assess power availability, infrastructure needs, and potential system impacts associated with the project
- *Colorado Department of Public Health and Environment (CDPHE):*
  Supports review of applicable environmental considerations, including deciding whether to issue data center projects any necessary air quality and water-related permits
- *Community Advocates & Environmental Non-Profits:*
  Local watershed and climate groups can provide input on environmental and community priorities and help inform discussions prior to public hearings
- *Adjacent Property Owners:*
  Offer feedback on potential local impacts such as land use, visual considerations, and noise.

Glossary

- *Additionality*
  Refers to whether a project (such as a renewable energy installation) would not have been built without a specific investment or demand, meaning it adds new capacity to the grid
- *Buy-and-dry*
  The practice of purchasing agricultural land primarily to transfer its water rights to another use (such as industrial or municipal), often resulting in reduced or discontinued farming on that land
- *Community Benefit Agreement (CBA)*
  A legally binding agreement between a developer and a community that outlines specific commitments, such as local hiring, funding, or infrastructure investments
- *Cooling System*
  The system used to remove heat from servers. Common types include air-cooled, evaporative (water-based), and liquid cooling systems
- *Dark Fiber*
  Unused or unlit fiber-optic cables that can be leased or sold for private data transmission
- *Dual Feed / Redundancy*
  A system design where a facility is connected to multiple independent power sources to ensure continuous operation in case one source fails
- *Hourly Matching*
  An energy procurement approach where electricity consumption is matched with renewable energy generation on an hourly basis, rather than averaged over a year
- *Indefeasible Right of Use (IRU)*
  A long-term agreement that grants the right to use a portion of fiber-optic infrastructure, typically for a fixed period (e.g., 20+ years)
- *Interconnection*
  The process of connecting a large electricity user (like a data center) to the power grid, including required studies and infrastructure upgrades

- *Internet of Things*
  A network of physical "things" embedded with sensors, software, and technologies that connect and exchange data with other devices over the internet. These devices, ranging from smart home appliances to industrial sensors, facilitate automation, real-time monitoring, and improved operational efficiency.
- *Load*
  The amount of electricity being used at a given time. Large data centers represent significant continuous (“baseload”) demand on the grid
- *Payment in Lieu of Taxes (PILT)*
  An agreement where a company makes fixed payments to a local government instead of traditional property taxes, often to provide predictable revenue
- *Peak Demand*
  The highest level of electricity demand a facility or system reaches during a specific period
- *Power Usage Effectiveness (PUE)*
  A metric that measures energy efficiency in a data center. It is the ratio of total facility energy use to the energy used by computing equipment. Lower values indicate higher efficiency
- *Renewable Energy Credits (RECs)*
  Certificates that represent proof that electricity was generated from a renewable source. They can be purchased separately from actual electricity supply
- *Substation*
  A facility that steps electricity voltage up or down and distributes power to end users.
- *Transmission Line*
  High-voltage power lines that carry electricity over long distances from power plants to substations
- *Water Usage Effectiveness (WUE)*
  A metric that measures how efficiently a data center uses water, typically expressed as liters of water per unit of IT energy consumption.